

PROJECT MANUAL – VOLUME 1 OF 2



# Tomball High School #3

Tomball Independent School District

Tomball, Texas





# MORE THAN ARCHITECTS

## PROJECT MANUAL

Project Name: Tomball High School #3 – Volume 1 of 2  
Client Name: Tomball Independent School District Location: Tomball, Texas  
Project Number: (1940-01-01) Date: November 2, 2023

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11/2/2023

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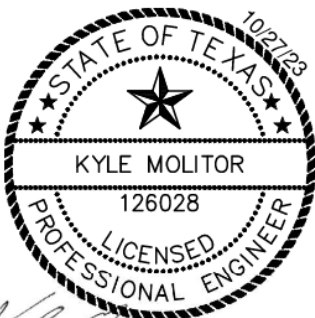
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10.30.2023 F-1252

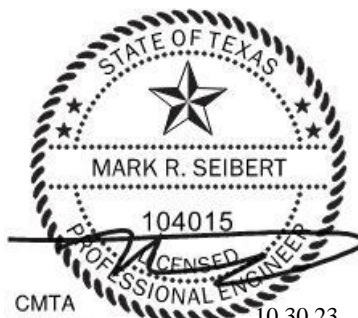
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09 5426	LINEAR WOOD CEILINGS	3
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09 6466	WOOD ATHLETIC FLOORING	5
09 6500	RESILIENT FLOORING	4
09 6613	PORTLAND CEMENT TERRAZZO FLOORING	4
09 6723	RESINOUS FLOORING	5
09 6816	SHEET CARPETING	4
09 7223	CUSTOM DIGITAL WALL COVERING	4
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10 2800	TOILET, BATH, AND LAUNDRY ACCESSORIES	10
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11 5713	VOCATIONAL SHOP EQUIPMENT	3
11 6133	THEATRICAL RIGGING SYSTEMS	22
11 6143	STAGE DRAPERIES	13
11 6162	THEATRICAL LIGHTING SYSTEMS	40
11 6623	GYMNASIUM EQUIPMENT	5
11 6843	SCOREBOARDS	8

**DIVISION 12 - FURNISHINGS**

12 2100	WINDOW BLINDS	2
12 2400	WINDOW SHADES	5
12 3200	MANUFACTURED WOOD CASEWORK	7
12 3551	MUSIC INSTRUMENT STORAGE CASEWORK	5
12 3600	COUNTERTOPS	4
12 6100	FIXED AUDIENCE SEATING	4
12 6613	TELESCOPING BLEACHERS	5
12 9313	BICYCLE RACKS	2

**END OF SECTION**



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**SECTION 00 0115**  
**LIST OF DRAWING SHEETS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Following are the drawings which form a part of the contract, as set forth in subparagraph 1.1.1 of the accompanying "General Conditions of the Contract for Construction".

**1.02 TITLE OF DRAWINGS:**

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**GENERAL**

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G1.02.1	GENERAL DATA - VOLUME 1
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G2.00.2	HCFCR- BLDG 2 (TICKETING)
G2.00.3	HCFCR- BLDG 3 (CONCESSIONS)
G2.00.4	HCFCR- BLDG 4 (CONCESSIONS)
G2.00.5	HCFCR- BLDG 5 (FOOTBALL PRESSBOX & BLEACHERS)
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G2.03	CODE ANALYSIS PLAN - AREA A
G2.04	CODE ANALYSIS PLAN - AREA B
G2.05	CODE ANALYSIS PLAN - AREA C
G2.06	CODE ANALYSIS PLAN - AREA D
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G3.01	EXTERIOR WALL & ROOF TYPES
G3.02	INTERIOR PARTITION TYPES
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G3.05	WALL PENETRATIONS - ACOUSTICAL
G3.06	WALL PENETRATIONS - CMU
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**CIVIL**

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C0.03	HARRIS COUNTY EXPRESS REVIEW SHEET
C0.04	HARRIS COUNTY FLOOD CONTROL DISTRICT REVIEW SHEET
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C1.01	FIRE ACCESS PLAN
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C2.02	EROSION CONTROL PLAN (2 OF 8)
C2.03	EROSION CONTROL PLAN (3 OF 8)
C2.04	EROSION CONTROL PLAN (4 OF 8)
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S8.10	BRACED FRAME ELEVATIONS
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A1.03	FLOOR PLAN - LVL 1 - AREA 3
A1.04	FLOOR PLAN - LVL 1 - AREA 4
A1.05	FLOOR PLAN - LVL 1 - AREA 5
A1.06	FLOOR PLAN - LVL 1 - AREA 6
A1.07	FLOOR PLAN - LVL 1 - AREA 7
A1.08	FLOOR PLAN - LVL 1 - AREA 8
A1.09	FLOOR PLAN - LVL 1 - AREA 9
A1.10	FLOOR PLAN - LVL 1 - AREA 10
A1.11	FLOOR PLAN - LVL 1 - AREA 11
A1.12	FLOOR PLAN - LVL 1 - AREA 12
A1.12A	DIMENSIONAL CONTROL PLAN - AUDITORIUM
A1.12B	PARTIAL FLOOR PLANS - AUDITORIUM
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A1.22	FLOOR PLAN - EQUIPMENT PLATFORMS 5 & 6
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A1.32	ENLARGED PLANS - TOILETS
A1.33	ENLARGED PLANS - TOILETS
A1.34	ENLARGED PLANS - STAIRS
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A1.36	ENLARGED PLANS - STAIRS
A1.37	ENLARGED PLANS - STAIRS & ELEVATOR
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A1.44	PLAN DETAILS
A1.45	PLAN DETAILS
A1.46	PLAN DETAILS
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A2.06	REFLECTED CEILING PLAN - LVL 1 - AREA 6
A2.07	REFLECTED CEILING PLAN - LVL 1 - AREA 7
A2.08	REFLECTED CEILING PLAN - LVL 1 - AREA 8
A2.09	REFLECTED CEILING PLAN - LVL 1 - AREA 9
A2.10	REFLECTED CEILING PLAN - LVL 1 - AREA 10
A2.11	REFLECTED CEILING PLAN - LVL 1 - AREA 11
A2.12	REFLECTED CEILING PLAN - LVL 1 - AREA 12
A2.12A	REFLECTED CEILING PLAN - LVL 2 - AREA 12
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A2.15	REFLECTED CEILING PLAN - LVL 2 - AREA 15
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A2.17	REFLECTED CEILING PLAN - LVL 2 - AREA 17
A2.17A	ENLARGED REFLECTED CEILING PLAN - AREA 17
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A3.31	DOOR & WINDOW DETAILS
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A4.04	FINISH PLAN - LVL 1 - AREA 4
A4.05	FINISH PLAN - LVL 1 - AREA 5
A4.06	FINISH PLAN - LVL 1 - AREA 6
A4.07	FINISH PLAN - LVL 1 - AREA 7
A4.08	FINISH PLAN - LVL 1 - AREA 8
A4.09	FINISH PLAN - LVL 1 - AREA 9
A4.10	FINISH PLAN - LVL 1 - AREA 10
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A6.12	WALL SECTIONS
A6.13	WALL SECTIONS
A6.14	WALL SECTIONS
A6.15	WALL SECTIONS
A6.16	WALL SECTIONS
A6.17	WALL SECTIONS
A6.18	WALL SECTIONS
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A6.23	WALL SECTIONS
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A6.25	WALL SECTIONS
A6.26	WALL SECTIONS
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A6.28	WALL SECTIONS
A6.29	WALL SECTIONS
A6.30	WALL SECTIONS
A6.31	WALL SECTIONS
A6.32	WALL SECTIONS
A6.33	WALL SECTIONS
A6.34	WALL SECTIONS
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A8.10	EQUIPMENT PLAN - LVL 1 - AREA 10
A8.11	EQUIPMENT PLAN - LVL 1 - AREA 11
A8.12	EQUIPMENT PLAN - LVL 1 - AREA 12
A8.13	EQUIPMENT PLAN - LVL 1 - AREA 13
A8.14	EQUIPMENT PLAN - LVL 1 - AREA 14
A8.15	EQUIPMENT PLAN - LVL 2 - AREA 15
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M2.04	MECHANICAL FLOOR PLAN - LVL 1 - AREA 4
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M2.12A	MECHANICAL FLOOR PLAN - LVL 1 - HIGH VIEW - AREA 12
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M2.17	MECHANICAL FLOOR PLAN - LVL 2 - AREA 17
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M3.04	HYDRONICS & SENSORS - LVL 1 - AREA 4
M3.05	HYDRONICS & SENSORS - LVL 1 - AREA 5
M3.06	HYDRONICS & SENSORS - LVL 1 - AREA 6
M3.07	HYDRONICS & SENSORS - LVL 1 - AREA 7
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M3.10	HYDRONICS & SENSORS - LVL 1 - AREA 10
M3.11	HYDRONICS & SENSORS - LVL 1 - AREA 11
M3.12	HYDRONICS & SENSORS - LVL 1 - AREA 12
M3.13	HYDRONICS & SENSORS - LVL 1 - AREA 13
M3.14	HYDRONICS & SENSORS - LVL 1 - AREA 14
M3.15	HYDRONICS & SENSORS - LVL 2 - AREA 15
M3.16	HYDRONICS & SENSORS - LVL 2 - AREA 16
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M6.03	MECHANICAL DETAILS
M6.04	MECHANICAL DETAILS
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E1.04	ELECTRICAL SITE PLAN - AREA 4
E1.05	ELECTRICAL SITE PLAN - AREA 5
E1.06	ELECTRICAL SITE PLAN - AREA 6
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**TOMBALL INDEPENDENT SCHOOL DISTRICT  
PROPOSAL #947-23 – TOMBALL WEST HIGH SCHOOL  
ISSUED: OCTOBER 30, 2023  
REQUEST FOR COMPETITIVE SEALED PROPOSALS FOR  
THE A NEW 3,000 STUDENT HIGH SCHOOL CAMPUS**

Pursuant to the provisions of the Texas Government Code Chapter 2269, Subchapter D, as amended, the Tomball Independent School District is seeking submissions from qualified Contractors to provide Construction Services for the project identified in this RFP.

Refer to Section II and III for critical dates and time requirements necessary to propose on this project. There is a non-mandatory pre-proposal meeting.

Any Proposal received after such time will not be considered and will be returned unopened. Unsigned Proposals and/or Proposals received via Facsimile or Email will not be considered. Part 1 will be held unopened, and the names of Respondents withheld by the Owner, until the receipt of Part 2 responses. When Part 1 and Part 2 are received, pursuant to the provisions of the Texas Government Code §2269.151, the Owner's staff will publicly open and read aloud the names of the respondents and monetary offer stated in the Proposals Part 1 and the Alternates stated in Part 2. Within (24) hours a short list of at least of the top proposers will be created and those selected will be invited for a team interview. Refer to the Schedule of events for the projected date and time window. All proposers are required to be available with their team for this interview if selected and shall keep this date open until notified. Based on all criteria submitted and the final interview results, the district will recommend a proposer to the BOT for approval.

Within forty-five (45) days following the date of the opening, the proposals will be evaluated and ranked in relation to the selection criteria set forth herein. Award will be made utilizing the Evaluation Criteria as required by Texas Education Code §2269.154 and as stated herein. Respondents must provide all requested information; failure to comply with any portion of the solicitation will be reflected in the evaluation process.

This RFP and all documents in total can be downloaded from the Tomball ISD Purchasing website, <https://www.tomballisd.net/about-tisd/departments/finance/purchasing/bids-and-proposals>. If you have trouble with the link, go to the Tomball ISD website and at the "Find" bar type bids. This will take you directly to the procurement page. Contact the Program Manager if you encounter a problem.

**TOMBALL INDEPENDENT SCHOOL DISTRICT**  
**PROPOSAL #947-23 – TOMBALL WEST HIGH SCHOOL**  
**ISSUED: OCTOBER 30, 2023**  
**REQUEST FOR COMPETITIVE SEALED PROPOSALS FOR**  
**THE A NEW 3,000 STUDENT HIGH SCHOOL CAMPUS**

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## I. INTRODUCTION

Pursuant to the provisions of the Texas Government Code § 2269, Subchapter D, it is the intent of the Tomball Independent School District (hereinafter known as Owner) to solicit proposals from qualified vendors to provide Construction services in the process as described herein.

**Project Team:** The selected Respondent will join a Project Team which will include Owner Administration, Program Manager and Architect/Engineer, all of whom will be engaged in a cooperative effort to provide the Owner with successful and cost-effective solutions for the described project.

**Project Information:** The Owner plans to build a new two-story High School, with an *approximate* total area of 531,000 sf for *approximately* 3,000 students. This school is considered a greenfield site as nothing existed there prior to this time. The District has by other contracts constructed or will have constructed the storm detention for the entire site, brought gas and water to the artificial lot line of the project and coordinated with the local power company for the site service available for your connection at their pole locations. Connection for power to this project shall be made via underground service which is the responsibility of this project.

The Project may include the following general scope items:

1. Site utilities, cement concrete paving, drainage ditches, underground utility services, removal and fill, coordination with existing storm system and its construction by others and related site improvements.
2. Foundation, footings, piers, select fill placement and compaction.
3. Structural frame and masonry bearing walls.
4. Metal fabrications
5. Face brick, cast stone, & similar types of veneer
6. Metal wall panels
7. Aluminum, glass and window wall
8. Roofing as specified.
9. Interior walls with built and applied finishes
10. Tile, resilient flooring, sheet carpeting, resinous athletic flooring
11. Suspended plaster, suspended drywall, lay-in panels, sound absorbing units.
12. Steel doors and frames, wood doors, Kynar coated storefront, overhead coiling doors.
13. Casework & millwork
14. Specialties
15. Food Service
16. Hydraulic elevators
17. Automatic sprinkler system
18. Plumbing systems
19. HVAC Systems and building automation.
20. Electrical, telecommunications systems, telephone systems, data cabling and infrastructure, lightning protection and emergency power
21. Fire detection, alarm and emergency call systems

The substantial completion date is stated in the proposal form but no later than May 30, 2026  
The Owner's estimated cost of construction \$198,000,000.00.

**ARCHITECT:**

22. Huckabee Architects  
1700 City Plaza Dr., Suite 125  
Spring, Texas 77389  
Caitlin Munch, AIA – Architect  
915.588.9548

**PROGRAM MANAGER: (Owner's Representative)**

23. Lockwood, Andrews & Newnam, Inc.  
(Local Office) 1110 Baker Dr.  
Tomball, Texas 77375  
Robert Wilbanks, AIA – Program Manager  
832.570.7078

## **II. RFP ADVERTISEMENT, AVAILABILITY, AND DELIVERY**

Responses are due as noted in Section III – Probable Schedule of Events.

All responses must be submitted in a sealed envelope/package, delivered to the listed address and labeled as noted below. The label shall be clearly printed on the face of the package as noted below and read:

*(Label)*

**Attention: Mr. Jim Ross, CFO  
Tomball ISD Annex Building  
Re: Tomball West High School  
1110 Baker Dr  
Tomball, TX 77375**

All questions shall be addressed as follows: Questions concerning this RFP shall be directed to the Owner's Program Manager, in writing, at the email address provided below. Questions concerning the Contract Documents shall be addressed to the Architect, in writing, at the email address below. Verbal questions and explanations are not permitted other than as described by this section, if any. All questions are due by the times listed in the Schedule of Events, Central Standard Time, (CST). Answers to questions will be issued in an Addendum and will be posted on Owner's Website. Refer to the link provided.

<b>Robert Wilbanks, Program Manager</b>		<b>Caitlin Munch - Architect</b>
1110 Baker Dr		1700 City Plaza Dr Suite 125,
Tomball, Texas, 77375		Spring, TX 77389
832.570.7078		(915) 588-9548
rwilbanks@lan-inc.com		caitlin.munch@huckabee-inc.com

**CRITERIA FOR SELECTION:**

Consistent with the Texas Government Code 2269.155, the selection criteria and weighting used for the selection process is listed below:

All Proposers- Maximum 100 Points

- |  |           |
|--|-----------|
| A. Proposed amount for base proposal,                                  | 30 points |
| B. Evaluation survey of company references and project contacts,       | 25 points |
| C. History of company performance,                                     | 15 points |
| D. Similar company project experience and qualifications,              | 10 points |
| E. Similar individual personnel project experience and qualifications, | 10 points |
| F. Safety EMR score,   | 5 points  |
| G. Financial stability,  | 5 points  |

All responses in your proposal may be used to rank Respondent based on those criteria. The Owner reserves the right to verify the accuracy and completeness of all responses by using any information available to the Owner without regard to whether such information appears in your proposal.

By submitting a Proposal, each Respondent agrees to waive any claim it has or may have against the Owner, the Architect/Engineer, and their respective trustees, agents and employees, and any reference sources, arising out of or in connection with the administration, evaluation, or recommendation of any proposal; waiver of any requirements under the proposal documents; acceptance or rejection of any proposal; and award of a contract.

The Owner reserves the right, at its sole discretion, to request clarification or other information to evaluate any submission in order to make the award of the contract in the best interests of the Owner.

The Owner reserves the right to negotiate terms and conditions including scope, staffing levels, and fees, with the highest ranked responder. If an agreement cannot be reached with the highest ranked responder, the Owner will terminate negotiations in writing and reserves the right to negotiate with the next highest ranked responder and so on until an agreement is reached. When agreement is reached, the Owner will submit its recommendation to the School Board for approval and award of contract.

All official bid documents and addenda will be posted on the Owner's website for your access. It is your responsibility to check the website to verify availability of any new addenda or changes. Critical dates are all consolidated in section III PROBABLE SCHEDULE OF EVENTS.

### III. PROBABLE SCHEDULE OF EVENTS

	<u>Date</u>	<u>Time</u>	<u>Event</u>
A.	October 27, 2023 November 3, 2023 November 1, 2023	N/A N/A N/A.	1st Advertisement Posted for this CSP. 2nd Advertisement Posted for this CSP. RFP Posted on TISD Website
B.	November 8, 2023	11:00 A.M.	<b>Pre-Proposal Conference</b> 1110 Baker Drive Tomball, Texas 77375 Site Visit may follow this conference
C.	November 14, 2023	2:00 P.M.	<b>References submitted in Excel File provided with RFP Send to:</b> Toni O'Bryan 281.620.1710 tmobryan@lan-inc.com
D.	December 8, 2023	2:00 P.M.	<b>Deadline for questions</b>
E.	December 13, 2023	12:00 P.M.	Final Addendum Posted
F.	December 19, 2023	1:30 P.M.	<b>Part 1 Base Bid</b> Attn: Mr. Jim Ross, Director of Projects, and Development 1110 Baker Drive Tomball, Texas 77375
G.	December 19, 2023	2:30 P.M.	<b>Part 2 Alternates</b> Due same location as Part 1
H.	December 19, 2023	2:40 P.M.	<b>Public Opening of Bids</b> Same location where bids were submitted
I.	December 21, 2023	TBD	<b>Interview of Short-Listed Firms</b> Time TBD. Possible time frame between 10 am and 3 pm CST
J.	December 21, 2023	N/A	Final Evaluations Complete – Recommendation to the BOT is written.
K.	January 9, 2024	5:30 P.M.	Regular BOT meeting – Presented for Approval
M.	January 11, 2024	12:00 P.M.	Final Contract Agreement and General Conditions sent to Successful Bidder for Execution.
N.	January 15, 2024	12:00 P.M.	Anticipated Notice to Proceed. P.O. to be issued upon receipt of bonds and insurance.
O.	<b>May 30, 2026</b>	<b>12:00 A.M.</b>	<b>Substantial Completion Deadline</b>

**\*\*Note-all times are Central Standard Time**

Any Proposal received after such time will not be considered and will be returned unopened.  
Unsigned Proposals and/or Proposals received via Facsimile or Email will not be considered.

Part 1 will be held unopened, and the names of Respondents withheld by the Owner until the receipt of Part 2 responses. When Part 1 and Part 2 are received, pursuant to the provisions of the Texas Government Code §2269.151, the Owner's staff will publicly open and read aloud the names of the respondents and monetary offer stated in the Proposals Part 1 and the Alternates stated in Part 2. Within Forty-five (45) days following the date of the opening, the proposals will be evaluated and ranked in relation to the selection criteria set forth herein. Award will be made utilizing the Evaluation Criteria as required by Texas Government Code §2269.154 and as stated herein. Respondents must provide all requested information; and failure to comply with any portion of the solicitation will be reflected in the evaluation process. Proposals that have been opened may not be changed for the purpose of correcting an error in the price. Other than price, a proposer may have the right to change any other error or mistake in the proposal as may be permitted by applicable law and subject to the approval of the Owner, unless such change would be in contravention of statutory or common law requirements or unless such change would give an unfair advantage to the proposer making such change.

#### **IV. SUBMISSION FORMAT & CONTENT REQUIREMENTS**

The contents of the Respondent Proposal must be complete in description, concise in volume, and austere in form.

The Proposal should be in the format of a written report and should be prepared on 8-1/2" x 11" sheets (single-sided) unless noted below and bound with coil or three ring binding.

1. Part 1

a) One (1) original containing an executed version of the following.

- (1) 0 TAB A - Letter of Interest
- (2) 0 TAB B - Executive Summary
- (3) 0 TAB C - Submission Questionnaire
- (4) VII.8.a) Provide bidder's OSHA (Occupational Safety and Health Administration) inspection logs for the last three years.

b) Provide a loss analysis from the bidder's insurance carrier.

c) Provide a loss history covering all lines of insurance coverage carried by the bidder.

- (1) TAB E - Personnel
- (2) 0 TAB F - Additional Information
- (3) 0 TAB I - Optional Information
- (4) 0 TAB G - EMR

2. Furnish companies EMR ratings for the past five (5) years.

- (1) TAB H - Financial Information (May be submitted in separate sealed envelope if preferred. Only a single original is required for this.)
- (2) EXHIBIT A -PROPOSAL FORM

- (3) TAB K INCLUDES Sections XV - **XXXI**
- (4) EXHIBIT B – BID BOND
- (5) EXHIBIT C - FELONY CONVICTION NOTIFICATION
- (6) EXHIBIT D - ACKNOWLEDGMENT FORM - NON-COLLUSION STATEMENT
- (7) EXHIBIT E – PROOF OF INSURABILITY
- (8) EXHIBIT F – PROOF OF BONDING CAPACITY
- (9) EXHIBIT G - SIGNATURE PAGE AND DECLARATION OF COMPLIANCE
- (10) EXHIBIT H - DEVIATION AND EXCEPTIONS FORM
- (11) EXHIBIT I – CERTIFICATE OF RESIDENCY
- (12) EXHIBIT J - VENDOR STATEMENT OF DEBARMENT/SUSPENSION
- (13) EXHIBIT K – REQUEST FOR TAXPAYER IDENTIFICATION NUMBER
- (14) EXHIBIT L – FORM 1295-CERTIFICATE OF INTERESTED PARTIES
- (15) EXHIBIT M – CERTIFICATION REGARDING TERRORIST ORGANIZATIONS AND BOYCOTT OF ISRAEL
- (16) EXHIBIT N – CERTIFICATION REGARDING BOYCOTTING CERTAIN ENERGY COMPANIES
- (17) EXHIBIT O – CERTIFICATION PROHIBITING DISCRIMINATION AGAINST FIREARM AND AMMUNITION INDUSTRIES
- (18) EXHIBIT P – CERTIFICATION REGARDING CERTAIN FOREIGN-OWNED COMPANIES IN CONNECTION WITH CRITICAL INFRASTRUCTURE

b) Three (3) copies of above EXCEPT that EXHIBIT A –PROPOSAL FORM and Part 2 documents are not required to be included.

c) One (1) flash drive containing:

- (1) PDF of items stated in section IV.1.a) EXCEPT that EXHIBIT A –PROPOSAL FORM and Part 2 documents are not required to be included.
- (2) Completed Microsoft Excel File in response to part VII.4 and VII.5

### 3. Part 2

a) One (1) original containing an executed version of the following.

- (1) TAB L – INCLUDES SECTION XXXII - XXXIII
- (2) EXHIBIT R – BID ALTERNATES AND UNIT PRICE FORM

(3) EXHIBIT S – KEY SUBCONTRACTORS (See form for requirements.)

It is not required to re-state each question in the response. However, provide section numbers, and outline level description of the response item since the evaluation criteria will rely on certain sections of the response.

Respondents may provide supplemental materials further describing their capabilities and experience.

Owner is a governmental body subject to the Texas Public Information Act. Proposals submitted to Owner as a result of this procurement solicitation may be subject to release as public information after contracts are executed or the procurement is terminated. If a Respondent believes that its Proposal, or parts thereof, may be exempted from disclosure under Texas law, the Respondent must specify page-by-page and line-by-line the parts of the Proposal which it believes are exempt. In addition, the Respondent must specify which exception(s) to the Texas Public Information Act are applicable and provide detailed reasons to substantiate the exception(s). Vague or general claims of confidentiality will not be accepted. Owner assumes no obligation or responsibility relating to the disclosure or nondisclosure of information submitted by Respondents.

4. The Owner strictly complies with all statutes, court decisions, and opinions of the Texas Attorney General with respect to disclosure of Respondent's information.

5. Any respondent wishing to maintain confidentiality of financial information must include a written request for same with the submission of the proposal.

## **V. DEFINITIONS**

Respondent: The prime General Contractor company to join the Architect, Owner representatives and Program Manager to ensure optimal Cost Control, Scheduling, Phasing of Packages and Construction of Owner facilities.

Company: The prime General Contractor to join the Architect, Owner representatives and Program Manager to ensure optimal Cost Control, Scheduling, Phasing of Packages and Construction of Owner facilities.

Program Manager: The entity contracted by the Owner to provide overall fiduciary responsibilities and direct oversight of the contractor and A/E Team to ensure performance of actions contributing to the success of the owner's objective.

RFP: Request for Proposals

Owner: Tomball Independent School District

## **VI. TERM OF CONTRACT**

The contract awarded in response to this RFP will be for General Contracting Services for RFP# 947-23 TWC-High School. The Owner has defined project completion dates for the anticipated work.

## **VII. SUBMISSION REQUIREMENTS**

TAB A - Letter of Interest



**TAB B - Executive Summary**

Each respondent must include an executive summary briefly highlighting the respondent's qualifications and shall include how the respondent is most qualified to meet the evaluation criteria.

**TAB C - Submission Questionnaire**

Please provide the following information in the sequence and format prescribed by this questionnaire. Supplemental materials providing additional information may be provided in a separate format, but the information requested below is to be provided in this format. Failure to provide clear, transparent, non-elusive answers will be deemed non-responsive and scored accordingly.

**1. Firm Information**

- a) Name of Firm
- b) Address of Principal Office
- c) Phone and Fax Number
- d) Primary Individual (Point of Contact) for this RFP; name and email

**2. Firm Organization**

- a) Form of Business Organization (corporation, partnership, individual, joint venture, other?)
- b) How many years has your organization been in business in its current capacity?
- c) How many years has your organization been in business under its present name? Under what other or former names has your organization operated?
- d) If your organization is a corporation, answer the following: Date of incorporation, State of incorporation, President's name, Vice-President's name(s), Secretary's name, and Treasurer's name.
- e) If your organization is a partnership, answer the following: Date of organization, Type of partnership (if applicable), and Name(s) of general partner(s).
- f) If your organization is individually owned, answer the following: Date of organization, Name of owner.
- g) If the form of your organization is other than those listed above, describe it and name the principals.

**TAB D - Respondent Project Experience**

**3. Construction value**

- a) What is the construction dollar value, year by year, of all work under contract in all locations by your company for the period of 2017-2022?

- b) What is the construction dollar value, year by year, of all work under contract in Texas by your company for the period of 2017-2022?
- c) What is the construction dollar value, year by year, of all work under contract in Harris and all Contiguous Counties by your company for the period of 2017-2022?
- d) What percentage of your company's total construction dollar value, year by year, does all work under contract in Harris and all Contiguous Counties by your company for the period of 2017-2022 represent?
- e) What percentage of all work under contract in Harris and all Contiguous Counties by your company for the period of 2017-2022 has been K-12 school construction?
- f) What is the full time equivalent (FTE) employee count in all Texas locations by your company for the period of 2017-2022?
- g) What is the largest single executed contract value, year by year, by your company for the period of 2017-2022?

Section	2017	2018	2019	2020	2021	2022
VII.3.a)						
VII.3.b)						
VII.3.c)						
VII.3.d)						
VII.3.e)						
VII.3.f)						
VII.3.g)						

4. Completed Work (through substantial completion) within the last thirty-six months: List K-12 school projects constructed by your organization in Texas. The Respondent is obligated to provide accurate contact information for contacting the persons named below during a survey process that will be used during the evaluation scoring. **An oversized (11x17) table format concisely depicting all projects is required to be folded and inserted in the binder.** Respondents must use the Microsoft Excel file available with this RFP. For each project, provide:

- a) The Owner Entity
- b) Name of the Project

- c) State if the project was new construction, renovation, addition or combination.
- d) Type of construction contract (A101, A133, Owner Unique, etc.)
- e) Nature of the project/function of the building (Eg. New High School with Career Tech programs, athletic complex and natatorium)
- f) Size (SF)
- g) Construction delivery method (CMAR, CSP, Hard Bid, Etc.)
- h) Original contract (or GMP) cost
- i) Final contract (or GMP) cost
- j) Number of Change Orders (if any), either cost or time, (not change proposals, contingency expenditures or similar) with brief 150-word explanation, if desired
- k) Bid date/Final GMP
- l) Contractual original completion date
- m) Actual completion date
- n) Number of claims filed by contractor with brief explanation.
- o) Number of RFI's
- p) Name of major subcontractors
- q) Owner (Primary contact) contact information (If LAN was the Program Manager, do not list LAN as the Owner's Primary Contact):
  - (1) Name,
  - (2) title,
  - (3) email address,
  - (4) phone number
- r) Architect contact information:
  - (1) Company name
  - (2) Name,
  - (3) title,
  - (4) email address,
  - (5) phone number

5. Current Work: List up to five (5) projects of similar size and scope currently under construction by your organization. List the projects in order of priority, with the most relevant project listed first. The Respondent is obligated to provide accurate contact information for contacting the persons named below during a survey process that will be used during the evaluation scoring. An oversized (11x17) table format concisely depicting all projects is required. Respondents must use the Microsoft Excel file available with this RFP. For each project, provide:

- a) The Owner Entity
- b) Name of the Project

- c) State if the project is new construction, renovation, addition or combination.
- d) Type of construction contract (A101, A133, Owner Unique, etc.)
- e) Nature of the project/function of the building (Eg. New High School with Career Tech programs, athletic complex and natatorium)
- f) Size (SF)
- g) Construction delivery method (CMAR, CSP, Hard Bid, Etc.)
- h) Original contract (or GMP) cost
- i) Current contract (or GMP) cost
- j) Number of Change Orders (if any) through current period, either cost or time, (not change proposals, contingency expenditures or similar) with brief 150-word explanation, if desired
- k) Bid date/Final GMP
- l) Contractual completion date
- m) Number of claims filed by contractor with brief explanation.
- n) Number of RFI's (To date)
- o) Name of major subcontractors
- p) Owner (Primary contact) contact information (If LAN was the Program Manager, do not list LAN as the Owner's Primary Contact):

- (1) Name,
- (2) title,
- (3) email address,
- (4) phone number

- q) Architect contact information:

- (1) Company name
- (2) Name,
- (3) title,
- (4) email address,
- (5) phone number

6. Contracting and Subcontracting:

- a) List the categories of work that your organization normally performs with its own forces. Would you propose to do any work with your own forces?
- b) List any subcontractors in which your organization has some ownership and list the categories of work those subcontractors normally perform.

7. Claims, Suits and Failure to Perform: (If the answer to any of the questions below is yes, please provide details). Note: Do not fail to respond to this question or

furnish vague responses. Point totals available under this category of evaluation will be affected if you choose not to fully respond.

- a) Has your organization ever failed to complete any work awarded?
- b) Are there any judgments, claims, arbitration proceedings or suits, pending or outstanding against your organization or its officers?
- c) Has your organization filed or been involved in any lawsuits or requested arbitration regarding construction contracts within the last sixty months?
- d) Within the last sixty months, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract?

8. Safety

- a) Provide bidder's OSHA (Occupational Safety and Health Administration) inspection logs for the last three years.
- b) Provide a loss analysis from the bidder's insurance carrier.
- c) Provide a loss history covering all lines of insurance coverage carried by the bidder.

TAB E - Personnel

- 9. Provide an organizational chart outlining all personnel that will be assigned to the project and their responsibilities.
- 10. Given the scope and schedule of the project, identify the personnel proposed, specifically the Project Manager, Job Superintendent or Superintendent(s), and Field Operations personnel proposed to work on the project. Prior to contracting, the Owner may interview the Project Manager/Job Superintendent that will be assigned to the project. Please reference these personnel to projects listed in items VII.4 and VII.5 where possible.

- a) Provide a resume and references for each individual stating:
  - (1) Proposed role on this project
  - (2) Description of responsibilities for this proposed role (what will this person do?)
  - (3) Relevant past project experience list with role that makes this individual the best choice for this project (Client, cost, seasonal construction schedule, repairs, renovations, new construction, HVAC, etc.)
  - (4) General background information; education, years of experience, registrations, affiliations,
  - (5) Years of service with your company
  - (6) Prior two (2) employers and years of service with each
  - (7) Last three (3) completed or ongoing project assignments

- (8) Contact information (Name, title, email address, phone number) for Owner's representative or Architect that could address questions regarding this individual for the last three (3) completed or ongoing projects.

TAB F - Additional Information

11. Letters of Recommendation: Furnish five (5) letters of recommendation from past or current K-12 Texas school district customers of the respondent, preferably from those projects listed in section VII.4 and VII.5.

TAB G - EMR

12. Furnish companies EMR ratings for the past five (5) years.

TAB H - Financial Information

13. Attach an audited financial statement, including your organization's latest balance sheet and income statement showing the following items. For confidentiality, this may be submitted in a separate sealed envelope noting FINANCIALS, CONFIDENTIAL. Financials are only reviewed by the district CFO:

- a) Current assets (e.g., cash, joint venture accounts, accounts receivable, notes receivable, accrued income, deposits, materials inventory, and prepaid expenses).
- b) Non-current assets (e.g., net fixed assets, other assets).
- c) Current liabilities (e.g., accounts payable, notes payable, accrued expenses, provision for income taxes, advances, accrued salaries and accrued payroll taxes).
- d) Non-current liabilities (e.g., notes payable).
- e) Capital accounts and retained earnings (e.g., capital, capital stock, authorized and outstanding shares par value, earned surplus, and retained earnings).
- f) Name and address of firm preparing attached financial statement and date thereof.
- g) Is the attached financial statement for the identical organization named under item VII.13 above? If not, explain the relationship and financial responsibility of the organization whose financial statement is provided (e.g., parent subsidiary).
- h) Will the organization whose financial statement is attached act as guarantor of the contract for construction?
- i) Provide the name, address and phone number of your financial institution.

14. Bonding

- a) Provide Name of bonding company and name and address of agent.

- b) Provide letter from bonding company stating the currently available bonding capacity of your company (Bonding limit minus current obligations)?

**TAB I - Optional Information**

15. Furnish any additional content not requested by other sections of this RFP that demonstrates the qualifications of your company.

**VIII. AMENDMENTS TO THE RFP**

Changes, amendments, or written responses to questions received regarding this RFP will be posted on the Tomball ISD Website from the link within this document. It is Respondent's responsibility to review this site and ascertain whether any amendments have been made prior to submission. No oral statement of any person shall modify or otherwise change or affect the terms, conditions or specifications stated in the RFP, and changes to the RFP – if any – shall be made in writing only. While it is possible that other websites may have this posting, the official site for downloading documents is the Tomball ISD website only.

**IX. RESTRICTIONS ON COMMUNICATION**

The Respondent's, or any agent or representative of Respondent shall not undertake any activities or actions to promote or advertise their qualifications or submission to any member of the Owner's Board of Trustees, the Owner's Administration or their respective staff persons, except as specifically requested in writing by to the named point of contact in section 0 at any time between the date of release of the RFP and the date of award of a contract by the Owner's Board of Trustees. This restriction extends to "thank you" letters, phone calls, emails and any contact that results in the direct or indirect discussion of the RFP and/or submission submitted by Respondent's. Violation of this provision by Respondent or his/her/its agent may lead to disqualification of his submission from consideration. The Owner reserves the right to contact any Respondent for clarification after responses are opened and/or to further negotiate with any Respondent if such is deemed desirable by Owner.

**X. EVALUATION**

The Owner will conduct a comprehensive evaluation of all submissions received in response to this RFP. The Owner may appoint a selection committee to perform the evaluation.

Each submission will be analyzed to determine overall responsiveness, qualifications under the RFP and Respondent's cost proposal. Respondents will be scored based upon these criteria listed in this RFP. The Owner may request additional information from Respondent's at any time prior to final approval of a selected Respondent. Final approval of a selected Respondent(s) is subject to the action of the Board of Trustees of the Owner.

The Owner reserves the right to conduct all research it deems necessary as part of its evaluation of Respondent's including their previous clients.

Following the RFP scoring process, a short list will be created for interviews. Proposers are required to be available on the date listed in the Probable Schedule of Events. Times will be provided when notified of shortlisting. Interviews will be conducted as a panel to include

Tomball ISD staff, LAN (District Program Manager) and the Architect. Following the interviews, Tomball ISD will review all data and make recommendations to the Board of Trustees.

The Owner will utilize the following criteria in the evaluation of responses:

<b>Points Value</b>	<b>Category</b>	<b>Evaluation Method</b>	<b>Reference Section</b>
30	Proposed Amount for Base Proposal and Owner-Selected Alternates	Respondents will receive an assigned share of the total available points in this category according to banded point categories shown in the "Table of Awarded Points". A formula will be used as follows to determine the award band for your proposal based on your percentage above the low bid: $\text{Percentage Above Low Bid} = \frac{(\text{Your combination of base price proposal and Owner-selected Alternates} - \text{minimum proposed combination of base price proposals and Owner-selected Alternates})}{(\text{minimum proposed combination of base price proposals and Owner-selected Alternates})}$ The result of the formula will be used to proportion the points awarded based on the "Table of Awarded Points"	XIV Forms
25	Evaluation Survey of Company References and Project Contacts	Respondent's references and stated project contacts will be sent a request to participate in a survey of your company. The weighted average overall score for your company will be used to allocate a pro-rated share of the total available points in this category. If 4 or fewer responses are received, your company will earn fractional points for this category. You are responsible for accuracy of email address. A formula will be used as follows: ("Reference Factor" * points available in the category). "Reference Factor" is determined as follows: If 4 or fewer responses = $\frac{(\text{Your Firm Average Score} - \text{Min of all Firms})}{(\text{Max of all Firms} - \text{Min of all Firms})} * (\text{number of responses} * 20\%)$ OR If 5 or more responses = $\frac{(\text{Your Firm Average Score} - \text{Min of all Firms})}{(\text{Max of all Firms} - \text{Min of all Firms})}$ . A minimum value not less than 20% of the available points will be awarded if 5 or more responses are received.	VII.4, VII.5
15	History of Company Performance	Respondent demonstrates consistent and average past and current workload to staff ratio, showing ability to adequately staff the work and company stability. Respondent shows no or little past history of claims, suits and failure to perform. Respondent shows low number of RFI Generated per project. Respondent shows ability to maintain cost with no cost increases. Positive safety record. Positive asset to liability ratio. Adequate bonding capacity. Strength of letters of reference.	VII.3, VII.4.n), VII.5.m), VII.7, VII.4.o), VII.5.n), VII.4.h), VII.4.i), VII.4.j), VII.5.h), VII.5.i), VII.8, VII.13, VII.14, VII.11



10	Similar Company Project Experience and Qualifications	Respondent <u>company</u> demonstrates similar company project experience by showing high proportion of Harris County and contiguous county region work, projects of comparable cost, complexity and timeframe to the work in the RFP. Respondent demonstrates high proportion of past experience with subcontractors named in proposal.	VII.3, VII.4, VII.4.p), VII.5.o), VII.5, VII.6, XXXIII
10	Similar Individual Personnel Project Experience and Qualifications	Respondent <u>individual personnel</u> proposed for the work in the RFP demonstrate similar project experience by showing high proportion of Harris County and contiguous county region work, projects of comparable cost, complexity and timeframe to the work in the RFP. Organizational approach to the project is clear.	VII.10.a), VII.9
5	Safety EMR score	Respondents will receive a pro-rated share of the total available points in this category. Respondent shows positive safety EMR score, relative to other respondents.	0
5	Financial stability	Respondents will receive a pro-rated share of the total available points in this category. Respondent shows positive asset to liability ratio. Adequate bonding capacity.	0

Table of Awarded Points

Percentage Above Low	Percentage of Available Points Allocated
0% to 0.0125%	100.00%
0.0126% to 0.25%	99.50%
0.26% to 0.51%	98.50%
0.52% to 0.77%	97.50%
0.78% to 1.03%	96.50%
1.04% to 1.29%	95.50%
1.3% to 1.55%	94.00%
1.56% to 1.81%	92.50%
1.82% to 2.07%	91.00%
2.08% to 2.33%	89.50%
2.34% to 2.59%	88.00%
2.6% to 2.85%	86.25%
2.86% to 3.11%	84.50%
3.12% to 3.37%	82.75%
3.38% to 3.63%	81.00%
3.64% to 3.89%	79.25%
3.9% to 4.15%	77.50%
4.16% to 4.41%	75.50%
4.42% to 4.67%	73.50%
4.68% to 4.93%	71.50%
4.94% to 5.19%	69.50%
5.2% to 5.45%	67.50%
5.46% to 5.71%	65.50%
5.72% to 5.97%	63.25%
5.98% to 6.23%	61.00%
6.24% to 6.49%	58.75%
6.5% to 6.75%	56.50%
6.76% to 7.01%	54.25%

7.02% to 7.27%	52.00%
7.28% to 7.53%	49.50%
7.54% to 7.79%	47.00%
7.8% to 8.05%	44.50%
8.06% to 8.31%	42.00%
8.32% to 8.57%	39.50%
8.58% to 8.83%	37.00%
8.84% to 9.09%	34.50%
9.1% to 9.35%	32.00%
9.36% to 9.61%	29.25%
9.62% to 9.87%	26.50%
9.88% to 10.13%	23.75%
10.14% to 10.24%	21.00%
10.25% to 11%	18.25%
11.01% to 12%	15.50%
12.01% to 13%	12.75%
13.01% to 14%	9.75%
15.01% to 17%	6.75%
17.01% to 19%	3.75%
19.01% to 100%	0.75%

## **XI. AWARD OF CONTRACT AND RESERVATION OF RIGHTS**

The Form of Contract will be AIA Document A101 - 2017, paired with the AIA Document A201-2017 General Conditions which will be issued via Addendum to Section XXXV, including incorporated reference files.

The Contract, if awarded, will be awarded to the Respondent whose Submission is deemed most advantageous providing the best overall value to the Owner, upon approval of the Owner's Board of Trustees.

The Owner may accept any Submission in whole or in part. If subsequent negotiations are conducted, they shall not constitute a rejection or alternate RFP on the part of the Owner; however, final selection of a Respondent is subject to approval by the Owner's Board of Trustees.

The Owner reserves the right to accept one or more Submissions or reject any or all Submissions received in response to this RFP, and to waive informalities and irregularities in the Submissions received. The Owner also reserves the right to terminate this RFP, and reissue a subsequent Solicitation, and/or remedy technical errors in the RFP Process.

This RFP does not commit the Owner to enter into a Contract, award any services related to this RFP, nor does it obligate the Owner to pay any costs incurred in preparation for submitting of the Submission for this RFP, or in anticipation of a Contract.

**Access and Audit Rights:** The Owner, or its authorized representative, shall be afforded unrestricted access to and permitted to inspect and copy all the respondent's records, which shall include but not be limited to accounting records (hard copy as well as computer readable data), correspondence, instructions, drawings, receipts, vouchers, memoranda and similar data relating to this Contract. The respondent shall preserve all such records for a period of five (5) years, or for such longer period as may be required by law, after final payment under this Contract. If this Contract is funded from contract/grant funds provided by the U.S. Government or the State of Texas, the Contract, books, and records shall be

available for review and audit by the Comptroller General of the U.S. and/or the Inspector general of the federal sponsoring agency, or the State of Texas and its duly authorized representatives.

Appeal/Protest Process. Any respondent who submitted a proposal may appeal the Owner's award, if the appeal is based on deviations from laws, rules, regulations, or Owner policies. Owner Board Policy GF(Local) applies to any respondent wishing to appeal a proposal and/or award of a contract. In the event the respondent is unsure about the award of the contract, it is the Proposer's responsibility to contact the Owner on the next business day after the award is announced and verify details concerning the award.

## **XII. PROPOSAL MODIFICATIONS AND WITHDRAWAL PRIOR TO PROPOSAL OPENING**

A Respondent may modify a Proposal by letter at any time prior to the submission deadline for receipt of Proposals. Modification requests must be received prior to the submission deadline. Modifications made before opening time must be initialed by Respondent guaranteeing authenticity. Proposals may not be amended or altered after the official opening with the single exception that any product literature and/or supporting data required by the actual specifications, if any, will be accepted at any time prior to the Owner's Board of Trustees consideration of same.

Likewise, any Respondent may modify a proposal by submitting a supplemental proposal in person prior to the scheduled closing time for receipt of proposals. Such supplemental proposal should mention only additions or subtractions to the original proposal so as to not reveal the final prices or terms to the Owner until the sealed proposal is open.

The Respondent or his duly authorized representative may withdraw a proposal by request, provided such request is received by the Owner at the place designated for receipt of proposals and prior to the time fixed for the opening of proposals. The Proposal Bond will be returned with the proposals if withdrawn in accordance with the above. The withdrawal of a proposal does not prejudice the right of the Respondent to file a new proposal at the time and place stated.

## **TAB J – Includes Sections XIII - XIV**

### **XIII. SUBMISSION CHECKLIST – INCLUDE IN YOUR PROPOSAL**

Use this checklist to ensure that all required documents have been included in the submission and that they are properly tabbed and appear in the correct order.

<b>PART 1 RESPONSE</b>		
<b>Document</b>	<b>Page Limit</b>	<b>Initial to indicate document is attached to submission</b>
0 TAB A - Letter of Interest	Unlimited	
0 TAB B - Executive Summary	Unlimited	
0 TAB C - Submission Questionnaire	Unlimited	

VII.8.a) Provide bidder's OSHA (Occupational Safety and Health Administration) inspection logs for the last three years.  a) Provide a loss analysis from the bidder's insurance carrier. b) Provide a loss history covering all lines of insurance coverage carried by the bidder.  TAB E - Personnel	Unlimited	
0 TAB F - Additional Information	Unlimited	
0 TAB I - Optional Information	Unlimited	
0 TAB G - EMR  2. Furnish companies EMR ratings for the past five (5) years. TAB H - Financial Information	Unlimited	
EXHIBIT A –PROPOSAL FORM	Unlimited	
TAB K INCLUDES Sections XV - <b>XXXI</b> EXHIBIT B – BID BOND	Unlimited	
EXHIBIT C - FELONY CONVICTION NOTIFICATION	Unlimited	
EXHIBIT D - ACKNOWLEDGMENT FORM - NON-COLLUSION STATEMENT	Unlimited	
EXHIBIT E – PROOF OF INSURABILITY	Unlimited	
EXHIBIT F – PROOF OF BONDING CAPACITY	Unlimited	
EXHIBIT G - SIGNATURE PAGE AND DECLARATION OF COMPLIANCE	Unlimited	
EXHIBIT H - DEVIATION AND EXCEPTIONS FORM	Unlimited	
EXHIBIT I – CERTIFICATE OF RESIDENCY	Unlimited	
EXHIBIT J - VENDOR STATEMENT OF DEBARMENT/SUSPENSION	Unlimited	
EXHIBIT K – REQUEST FOR TAXPAYER IDENTIFICATION NUMBER	Unlimited	
EXHIBIT L – FORM 1295-CERTIFICATE OF INTERESTED PARTIES	Unlimited	
EXHIBIT M – CERTIFICATION REGARDING TERRORIST ORGANIZATIONS AND BOYCOTT OF ISRAEL	Unlimited	
EXHIBIT N – CERTIFICATION REGARDING BOYCOTTING CERTAIN ENERGY COMPANIES	Unlimited	
EXHIBIT O – CERTIFICATION PROHIBITING DISCRIMINATION AGAINST FIREARM AND AMMUNITION INDUSTRIES	Unlimited	
EXHIBIT P – CERTIFICATION REGARDING CERTAIN FOREIGN-OWNED COMPANIES IN CONNECTION WITH CRITICAL INFRASTRUCTURE	Unlimited	
COMPLETED MICROSOFT EXCEL FILE IN RESPONSE TO PART VII.4 AND VII.5	Unlimited	
<b>PART 2 RESPONSE</b>		
TAB L – INCLUDES SECTION XXXII - XXXIII EXHIBIT R – BID ALTERNATES AND UNIT PRICE FORM	Unlimited	

EXHIBIT S – KEY SUBCONTRACTORS	Unlimited	
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**XIV. EXHIBIT A –PROPOSAL FORM**

Having examined the Request for Proposal prepared by the Owner, and in submitting this proposal, the undersigned agrees to the following:

1. To hold the proposal open for acceptance by the Owner for 60 days.
2. To hold alternate proposals open for acceptance by the Owner for 120 days
3. To execute Contract Documents within ten (10) days after the prescribed forms are presented for signature and give bond with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such contract.
4. The Owner maintains the right to reject any or all proposals, to waive informalities or minor irregularities in the proposal process and to accept the proposal which the Owner considers most advantageous. The Owner reserves the right to verify the accuracy and completeness of all responses by utilizing any information available to the Owner without regard to whether such information appears in the submission.
5. That this Proposal has been arrived at independently and is submitted without collusion with anyone to obtain information or gain any favoritism that would in any way limit competition or give an unfair advantage over respondents in the award of this proposal.
6. The Owner reserves the right to negotiate with any Respondent in a manner permitted by law.
7. The undersigned has reviewed the Contract and exhibits as modified by Owner and agrees to execute a final version of these contracts in accordance with the attached terms, subject to final approval by Owner.
8. By providing a response, each Applicant agrees to waive any claim it has or may have against the Owner, its Trustees, agents and employees, and any reference sources, arising out of or in connection with: the administration, evaluation, or recommendation of any response; waiver of any requirements in the Request for Proposals; acceptance or rejection of any response and award of the Contract.
9. The cost of developing a response is the sole responsibility of the Applicant. The Owner will not provide reimbursement of such cost and will not be liable for any preparation cost for any reason whatsoever.
10. Respondent has visited the site of the proposed work and fully acquaint themselves with the existing conditions there and should fully inform themselves as to the facilities involved, the difficulties and restrictions attending the performance of the contract. The Respondent should thoroughly examine and familiarize themselves with the drawings, technical specifications, and all other contract documents including this RFP. The contractor by the execution of the contract shall in no way be relieved of any obligation under it due to his failure to receive or examine any form or legal document or to visit the site or acquaint themselves with the conditions there existing. The Owner will be justified in rejecting any claim based on lack of inspection of the site prior to the proposal. Should a conflict be discovered, it is incumbent upon the contractor to assume the higher priced or more stringent condition of the issue in question.
11. The unit price, if requested, for each of the several items in the proposal shall include its pro rata share of overhead so that the sum of the products obtained by multiplying the quantity shown for each item by the unit price proposal represents the total proposal. Any proposal not conforming to this requirement may be rejected as informal. Special attention is drawn to this condition, as the unit prices will be used to determine the amount of any change orders resulting from an increase or decrease in quantities.

**Submit with Part 1**

**Company Name:**\_\_\_\_\_

- 1. Contract Time:** The undersigned agrees that, if the proposal is accepted, the Date of Commencement shall be as established in a “Notice to Proceed” from the Owner but no later than, January 15, 2024, and to obtain Substantial Completion of all work not later than May 30, 2026, subject to extensions of time as described in the Contract Documents. Failure of the contractor to submit, execute or otherwise return all necessary documents shall remain the sole responsibility of the contractor and the dates noted remain unchanged.
- 2. Construction Permit:** The undersigned acknowledges that the bid or proposal has been submitted with the understanding that the time from submission of the bid, or proposal until a building permit will be released is estimated as 90 calendar days. The owner may issue a notice to proceed prior to the date when a building permit is released and the contractor shall commence all activities on the project for which a building permit is not required, such as project submittals, site mobilization, subcontractor buyout, and similar activities. As this project is governed by Harris County, the rules regarding start shall be determined by industry standard within that jurisdiction. The decision to proceed with this project rests on the Owner. Where a permit has not been issued but work can proceed, the contractor agrees to proceed until such time as they cannot proceed with necessary approvals and inspections.

- 3. Addenda:** The undersigned acknowledges receipt of:

Addenda 1 .....dated ..... --/--/----

Addenda 2 .....dated ..... --/--/----

Addenda 3 .....dated ..... --/--/----

Addenda 4 .....dated ..... --/--/----

Addenda 5 .....dated ..... --/--/----

- 4. Base Proposal:** The undersigned agrees to perform the complete Work of this Project, for the lump sum price of (The Base Proposal includes an Owner’s contingency of \$7,000,000.00.):

\_\_\_\_\_ Dollars

(Amount written in words governs)

\$\_\_\_\_\_ (Amount in figures)

**Submit with Part 1**

**Company Name:**\_\_\_\_\_

Company:\_\_\_\_\_

Address:\_\_\_\_\_

City

ST

Zip

Telephone:\_\_\_\_\_ Fax:\_\_\_\_\_ Email:\_\_\_\_\_

Printed Name/Title:\_\_\_\_\_ Signature:\_\_\_\_\_

State whether firm is a: ☐ Corporation ☐ Partnership ☐ Individual



## **Submit with Part 1**

### **TAB K INCLUDES Sections XV - XXXI**

#### **XV. EXHIBIT B – BID BOND**

A bond in the amount of five (5) percent of the proposal issued by an acceptable surety licensed to do business in the State of Texas shall be submitted with each proposal. A certified check or bank draft payable to the Owner or negotiable U.S. Government Bonds (as par value) may be submitted in lieu of the Proposal Bond. Respondents are advised that performance and payment bonds are required for each project.

The bond or its comparable, will be returned to the Respondent as soon as practical after the opening of the proposals.

Furnish Bid Bond.

## Submit with Part 1

### BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we the undersigned, \_\_\_\_\_ as PRINCIPAL, and \_\_\_\_\_  
\_\_\_\_\_, as SURETY are held and firmly bound unto \_\_\_\_\_  
\_\_\_\_\_ hereinafter called the "Owner", in the penal sum of \_\_\_\_\_  
\_\_\_\_\_ Dollars, (\$ \_\_\_\_\_), lawful money of the United States, for the payment of which sum well and  
truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally,  
firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the Accompanying Bid, dated \_\_  
\_\_\_\_\_, for \_\_\_\_\_

NOW, THEREFOR, if the Principal shall not withdraw said Bid within the period specified therein after the opening of the  
same, or, if no period be specified, within sixty (60) days after the said opening, and shall within the period specified  
therefor, or if no period be specified, within ten (10) days after the prescribed forms are presented to him for signature,  
enter into a written contract with the Owner in accordance with the Bid as accepted, and give bond with good and sufficient  
surety or sureties, as may be required, for the faithful performance and proper fulfillment of such contract; or in the event  
of the withdrawal of said Bid within the period specified, or the failure to enter into such Contract and give such bond within  
the time specified, if the Principal shall pay the Owner the difference between the amount specified in said Bid and the  
amount for which the local Public Agency may procure the required work or supplies or both, if the latter be in excess of  
the former, then the above obligation shall be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS THEREOF, the above-bounded parties have executed this instrument under their several seals this \_\_\_\_\_  
day of \_\_\_\_\_, the name and corporate seal of each corporate party being hereto affixed and these  
present signed by its undersigned representative, pursuant to authority of its governing body.

(SEAL)

(SEAL)

Attest:

By: \_\_\_\_\_

Affix

Corporate

Seal

## Submit with Part 1

Attest:

By: \_\_\_\_\_

Affix

Corporate

Seal

Attest:

By: \_\_\_\_\_

Countersigned

By \_\_\_\_\_

\* Attorney-in-Fact, State of \_\_\_\_\_

### CERTIFICATE AS TO CORPORATE PRINCIPAL

I, \_\_\_\_\_, certify that I am the \_\_\_\_\_, Secretary of the Corporation named as Principal in the within bond; that \_\_\_\_\_, who signed the said bond on behalf of the Principal was then \_\_\_\_\_ of said corporation; that I know his signature, and his signature thereto is genuine; and that said bond was duly signed, sealed, and attested to, for and in behalf of said corporation by authority of this governing body.

Corporate

Seal

Title: \_\_\_\_\_

\* Power-of-attorney for person signing for surety company must be attached to bond.

## Submit with Part 1

### XVI. EXHIBIT C - FELONY CONVICTION NOTIFICATION

State of Texas Legislative Senate Bill No.1, Section 44.034, Notification of Criminal History, Subsection (a) states “a person or business entity that enters into a contract with a school Owner must give advance notice to the Owner if the person or an owner or operator of the business entity has been convicted of a felony. The notice must include a general description of the conduct resulting in the conviction of a felony.”

Subsection (b) states “a school Owner may terminate a contract with a person or business entity if the Owner determines that the person or business entity failed to give notice as required by Subsection (a) or misrepresented the conduct resulting in the conviction. The Owner must compensate the person or business entity for services performed before the termination of the contract.”

This notice is not required of a Publicly-held Corporation.

I, the undersigned agent for the company named below, certify that the information concerning notification of felony convictions has been reviewed by me and the following information furnished is true to the best of my knowledge.

Vendor's Name \_\_\_\_\_

Authorized Company Official's Name (Printed) \_\_\_\_\_

My company is a publicly held corporation; therefore, this reporting requirement is not applicable: Signature of Company Official

\_\_\_\_\_

## Submit with Part 1

b. My company is not owned nor operated by anyone who has been convicted of a felony.  
Signature of Company Official

\_\_\_\_\_

c. My company is owned or operated by the following individual(s) who has/have been convicted of a felony:

Name of Felon(s)\_\_\_\_\_

Details of Conviction(s)\_\_\_\_\_

Signature of Company Official\_\_\_\_\_

## Submit with Part 1

### XVII. EXHIBIT D - ACKNOWLEDGMENT FORM - NON-COLLUSION STATEMENT

The undersigned affirms that they are duly authorized to execute this contract, that this company, corporation, firm, partnership or individual has not prepared this submission in collusion with any other Respondent, and that the contents of this submission as to prices, terms or conditions of said submission have not been communicated by the undersigned nor by any employee or agent to any other person engaged in this type of business prior to the official opening of this submission.

Vendor: \_\_\_\_\_

Address: \_\_\_\_\_

Phone: \_\_\_\_\_

Respondent (Signature): \_\_\_\_\_

Respondent (Print Name): \_\_\_\_\_

Position with Company: \_\_\_\_\_

Signature of Company Official \_\_\_\_\_

Authorizing Submission: \_\_\_\_\_

Company Official (Print Name): \_\_\_\_\_

Official Position: \_\_\_\_\_

## **Submit with Part 1**

### **XVIII. EXHIBIT E – PROOF OF INSURABILITY**

Furnish proof of insurability from your insurance provider meeting the requirements set forth in the Contract, attached to this RFP. This can be in the form of a letter or other sample certificates attesting to the ability to comply with the insurance requirements.

## **Submit with Part 1**

### **XIX. EXHIBIT F – PROOF OF BONDING CAPACITY**

Furnish proof of bonding capacity from your bonding agent stating the **bonding limits, current obligations and free bonding capacity** meeting the requirements set forth in the Contract Documents, attached to this RFP. This can be in the form of a letter.



## Submit with Part 1

### XX. EXHIBIT G - SIGNATURE PAGE AND DECLARATION OF COMPLIANCE

Circle below to indicate the business structure of Respondent.

Individual/Sole Proprietorship

Partnership or Joint Venture

Corporation

Other Entity (State Type)

The undersigned certifies that (s) he is \_\_\_\_\_(title) of the Respondent entity named below; that (s)he is authorized to sign this Submission Form (if a Corporation then by resolution with Certified Copy of resolution attached) for and on behalf of the entity, if any, named below, and that (s)he is authorized to execute same for and on behalf of and bind said entity to the terms and conditions provided for in the Submission as required by this RFP, and has the requisite authority to execute an Agreement on behalf of Respondent, if awarded, and that the 11-digit Comptroller's Taxpayer Number for the entity, if any, is:

11-digit Comptroller's Taxpayer Number Employer Identification Number: \_\_\_\_\_

Respondent Organization Name\_\_\_\_\_

By: \_\_\_\_\_

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

By: \_\_\_\_\_

## Submit with Part 1

(If Respondent is a Joint Venture, an authorized signature from a representative of each party is required)

Printed Name: \_\_\_\_\_

Title: \_\_\_\_\_

By signing this Signature Page and Declaration of Compliance, I do hereby declare that I have read the Request for Proposal on which our Submission is submitted with full knowledge of the requirements and do hereby agree to furnish all services in full accordance with the requirements outlined in the Request for Proposal.

By signing and executing this submission, I further certify on behalf of my organization and represent to the Owner that Respondent has not offered, conferred or agreed to confer any pecuniary benefit, as defined by TEXAS PENAL CODE ANN.§ 218, or any other thing of value, as consideration for the receipt of information or any special treatment or advantage relating to this submission; the Respondent also certifies and represents that Respondent has not offered, conferred or agreed to confer a pecuniary benefit or other things of value as consideration for the recipients decision, opinion, recommendation, vote or other exercise of discretion concerning this submission; the Respondent certifies and represents that Respondent has neither coerced nor attempted to influence the exercise of discretion by any officer, trustee, agent or employee of the Owner concerning this submission on the basis of any consideration not authorized by law; the Respondent also certifies and represents that Respondent has not received any information not available to other Respondent so as to give the undersigned a preferential advantage with respect to this submission; the Respondent further certifies and represents that Respondent has not violated any state, federal or local law, regulation or ordinance relating to bribery, improper influence, collusion or the like and that Respondent will not in the future offer, confer, or agree to confer a pecuniary benefit or other thing of value to any officer, trustee, agent or employee of the Owner in return for the person having exercised the persons official discretion, power or duty with respect to this submission; the Respondent certifies and represents that it has not nor and will not in the future offer, confer, or agree to confer a pecuniary benefit or other thing of value to any officer, trustee, agent or employee of the Owner in connection with information regarding this submission, the submission of this submission, the award of this submission or the performance, delivery or sale pursuant to this submission.

## Submit with Part 1

### XXI. EXHIBIT H - DEVIATION AND EXCEPTIONS FORM

All respondents are expected to fully comply with all Terms and Conditions of this RFP, including all dates noted, the AIA A101-2017 Standard Form of Agreement and the AIA A201-2017 General Conditions of the Contract for Construction as amended by the Owner. Any proposed deviations or exceptions to the Terms and Conditions of this RFP, including AIA documents, MUST be noted on this sheet. In the absence of any entry on this Deviation Form, the respondent assures the Owner of their full compliance with the Terms and Conditions of this RFP and the AIA documents.

Any exceptions to the modified AIA Contract Documents should be noted along with suggested wording for each exception. The owner may consider any such exceptions in its evaluation of the Proposer's proposal but is not obligated to accept any such exceptions or proposed modifications. If the Proposer and Owner are unable to resolve any exceptions to the mutual satisfaction of both parties, the Owner reserves the right to reject the Proposer's proposal and award the Contract to another Proposer. Each Proposer, by making its proposal, represents that the Proposer has read, understands, and agrees to Owner's modifications to the AIA Documents. If a project is awarded to a Proposer and the Proposer requests changes to the Contract Documents, the Owner reserves the right to cancel the award and re-award the Project to an alternate Proposer. Requests to modify the terms of the Contract Documents during the pendency of this RFP will be denied.

Note that this deviation and exceptions form is NOT intended to note any deviations from the Construction Documents or Specifications and other information contained within the Project Manual. Any questions regarding those must be submitted in writing, per the terms of this RFP, and will be addressed accordingly in an Addenda. Should there be an issue which has not been resolved by addendum, and the contractor takes exception to the position advertised, that exception MUST be listed on this form to be considered.

The Owner will, at its sole discretion, determine whether the deviations listed below are acceptable. Furnish a description of the requested deviation, noting the impact that the proposed deviation will have on the cost and time of the project, if any, if accepted by the Owner. THIS DEVIATION FORM MUST BE SIGNED BY EACH RESPONDENT WHETHER THERE ARE DEVIATIONS LISTED OR NOT AND SUBMITTED WITH THIS PROPOSAL. THE PROPOSAL FURNISHED SHALL NOT BE QUALIFIED OR CONDITIONED IN ANY WAY ON ACCEPTANCE OF THE DEVIATIONS AND EXCEPTIONS LISTED BELOW.

DEVIATION:

Cost (+/-)

Time (+/-)

## Submit with Part 1

Respondent Organization Name\_\_\_\_\_

Authorized Signature\_\_\_\_\_

## Submit with Part 1

### XXII. EXHIBIT I – CERTIFICATE OF RESIDENCY

The State of Texas has passed a law concerning non-resident contractors. This law can be found in the Texas Government Code under Chapter 2252, Subchapter A. This law makes it necessary for the Owner to determine the residency of its bidders. In part, this law reads follows:

“Section: 2252.001

(3) ‘Non-resident bidder’ refers to a person who is not a resident.

(4) ‘Resident bidder’ refers to a person whose principal place of business in this state, including a

Contractor whose ultimate parent company or majority owner has its principal place of business in this state.

Section 2252.002

“A governmental entity may not award a governmental contract to a nonresident bidder unless the nonresident underbids the lowest bid submitted by a responsible resident bidder by an amount that is not less than the greater of the following:

(1) the amount by which a resident bidder would be required to underbid the nonresident bidder to obtain a comparable contract in the state in which the nonresident's principal place of business is located; or

(2) the amount by which a resident bidder would be required to underbid the nonresident bidder to obtain a comparable contract in the state in which a majority of the manufacturing relating to the contract will be performed.”

I certify that \_\_\_\_\_  
(Name of Company Bidding) is, under Section: 2252.001 (3) and (4),

\_\_\_\_\_ Resident Bidder

\_\_\_\_\_ Non-resident Bidder

My or our principal place of business under Section: 2252.001 (3) and (4), is in the city of

\_\_\_\_\_ in the state of \_\_\_\_\_

\_\_\_\_\_  
Signature of authorized Company Representative

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_/\_\_\_\_/\_\_\_\_

Date

## Submit with Part 1

### XXIII. EXHIBIT J - VENDOR STATEMENT OF DEBARMENT/SUSPENSION

I have read the conditions and specifications provided in the Request for Proposal document attached. I affirm, to the best of my knowledge, the company I represent has not been debarred or suspended from conducting business by the federal government or the State of Texas.

Debarment and Suspension (Executive Orders 12549 and 12689)—A contract award (see 2 CFR 180.220) must not be made to parties listed on the government wide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), "Debarment and Suspension." SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.

Pursuant to applicable law, the contractor certifies that during the term of an award for all contracts by the Owner resulting from this procurement process, the contractor certifies that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation by any federal department or agency or by the State of Texas. Contractor shall immediately provide written notice to the Owner if at any time the contractor learns that this certification was erroneous when submitted or has become erroneous by reason of changed circumstances. The Owner may rely upon a certification of a contractor that the contractor is not debarred, suspended, ineligible, or voluntarily excluded from the covered contract, unless the Owner knows the certification is erroneous.

Name of Company/Firm: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City/State/Zip: \_\_\_\_\_

Email Address: \_\_\_\_\_

Prepare By: \_\_\_\_\_

Company Official's Name: \_\_\_\_\_  
Printed

Company Official's Authorized Signature: \_\_\_\_\_

TITLE \_\_\_\_\_

TELEPHONE NUMBER \_\_\_\_\_ FAX NUMBER DATE \_\_\_\_\_

## **Submit with Part 1**

### **XXIV. EXHIBIT K – REQUEST FOR TAXPAYER IDENTIFICATION NUMBER**

Complete and submit Internal Revenue Service for “W-9”

## Submit with Part 1

### XXV. EXHIBIT L – FORM 1295-CERTIFICATE OF INTERESTED PARTIES

Complete and submit Texas Ethics Commission Form 1295 at the Texas Ethics Commission web site at <https://ethics.state.tx.us/forms/1295.pdf>.

#### **Certificate of Interested Parties (Form 1295 – must be filled out electronically with the Texas Ethics Commission's online filing application and attached to proposal)**

Owner is required to comply with House Bill 1295, which amended the Texas Government Code by adding Section 2252.908, Disclosure of Interested Parties. Section 2252.908 applies to a contract of Owner that (1) requires an action or vote by the Owner Board of Trustees before the contract may be signed; (2) has a value of at least \$1 million; or (3) is for services that would require a person to register as a lobbyist under Tex. Gov't Code Chapter 305. Section 2252.908 prohibits Owner from entering into a contract resulting from this RFP with a business entity unless the business entity submits a Disclosure of Interested Parties (Form 1295) to Owner at the time business entity submits the signed contract. Effective January 1, 2018, the Form 1295 requirement does not apply to: (1) a contract with a publicly traded business entity or wholly owned subsidiary of the same; (2) an electric utility; or (3) a gas utility. The Texas Ethics Commission has adopted rules requiring the business entity to file Form 1295 electronically with the Texas Ethics Commission. The following **definitions** apply:

- (1) **"Business Entity"** means an entity recognized by law through which business is conducted, including a sole proprietorship, partnership, or corporation. TEX. GOV'T CODE § 2252.908(1).
- (2) **"Interested Party"** means a person:
  - a) who has a controlling interest in a business entity with whom Owner contracts; or
  - b) who actively participates in facilitating the contract or negotiating the terms of the contract, including a broker, intermediary, adviser, or attorney for the business entity. TEX. GOV'T CODE § 2252.908(3).
- (3) **"Controlling interest"** means:
  - a) an ownership interest or participating interest in a business entity by virtue of units, percentage, shares, stock, or otherwise that exceeds 10 percent;
  - b) membership on the board of directors or other governing body of a business entity of which the board or other governing body is composed of not more than 10 members; or
  - c) service as an officer of a business entity that has four or fewer officers, or service as one of the four officers most highly compensated by a business entity that has more than four officers. *Subsection (c) does not apply to an officer of a publicly held business entity or its wholly owned subsidiaries.* TEX. ETHICS COMM. RULE 46.3(c).
- (4) **"Intermediary"** means a person who actively participates in the facilitation of the contract or negotiating the contract, including a broker, adviser, attorney, or representative of or agent for the business entity who:
  - a) receives compensation from the business entity for the person's participation;
  - b) communicates directly with the governmental entity or state agency on behalf of the business entity regarding the contract; and
  - c) is not an employee of the business entity. TEX. ETHICS COMM. RULE 46.3(e).

#### **As a "business entity," all vendors must:**

- (1) **complete Form 1295 electronically** with the Texas Ethics Commission using the online filing application, which can be found at [https://www.ethics.state.tx.us/whatsnew/elf\\_info\\_form1295.htm](https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm)
  - **All vendors must complete Form 1295, even if no interested parties exist**
  - In Section 2, insert Tomball Independent School District
  - In Section 3, insert the RFP# 947-23 TWC-High School for this proposal
- (2) **print a copy of the completed form** (make sure that it has a computer-generated certification number in the "Office Use Only" box)
- (3) have an authorized agent of the business entity **sign the form**
- (4) **submit** the completed Form 1295 by **attaching the form to your proposal.**



## **Submit with Part 1**

OWNER must acknowledge the receipt of the filed Form 1295 by notifying the Texas Ethics Commission of the receipt of the filed Form 1295 no later than the 30<sup>th</sup> day after receipt by OWNER. After OWNER acknowledges the Form 1295, the Texas Ethics Commission will post the completed Form 1295 to its website with seven business days after receiving notice from OWNER.

## Submit with Part 1

### XXVI. EXHIBIT M – CERTIFICATION REGARDING TERRORIST ORGANIZATIONS AND BOYCOTT OF ISRAEL

Respondent hereby certifies that it is not a company identified on the Texas Comptroller's list of companies known to have contracts with, or provide supplies or services to, a foreign organization designated as a Foreign Terrorist Organization by the U.S. Secretary of State under federal law. (Tex. Gov't Code §§ 2252.151-.154)

If (a) Respondent is not a sole proprietorship; (b) Respondent has ten (10) or more full-time employees; and (c) this Agreement has a value of \$100,000 or more, the following certification shall apply; otherwise, this certification is not required. Pursuant to Chapter 2271 of the Texas Government Code, the Respondent hereby certifies and verifies that neither the Vendor, nor any affiliate, subsidiary, or parent company of the Respondent, if any (the "Respondent Companies"), boycotts Israel, and the Respondent agrees that the Respondent and Respondent Companies will not boycott Israel during the term of this Agreement. For purposes of this Agreement, the term "boycott" shall mean and include refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes.

Name of Company/Firm: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City/State/Zip: \_\_\_\_\_

Email Address: \_\_\_\_\_

Prepare By: \_\_\_\_\_

Company Official's Name: \_\_\_\_\_

Printed

Company Official's Authorized Signature: \_\_\_\_\_

TITLE \_\_\_\_\_

TELEPHONE NUMBER \_\_\_\_\_ DATE \_\_\_\_\_

## Submit with Part 1

### XXVII. EXHIBIT N – CERTIFICATION REGARDING BOYCOTTING CERTAIN ENERGY COMPANIES

If (a) Vendor is not a sole proprietorship; (b) Vendor has ten (10) or more full-time employees; and (c) this Agreement has a value of \$100,000 or more that is to be paid wholly or partly from public funds, the following certification shall apply; otherwise, this certification is not required. Pursuant to TEX. GOV'T CODE Ch. 2274 of SB 13 (87th session), Vendor hereby certifies and verifies that Vendor, or any wholly owned subsidiary, majority-owned subsidiary, parent company, or affiliate of these entities or business associations, if any, does not boycott energy companies and will not boycott energy companies during the term of the Agreement. For purposes of this Agreement, the term "company" shall mean an organization, association, corporation, partnership, joint venture, limited partnership, limited liability partnership, or limited liability company, that exists to make a profit. The term "boycott energy company" shall mean "without an ordinary business purpose, refusing to deal with, terminating business activities with, or otherwise taking any action intended to penalize, inflict economic harm on, or limit commercial relations with a company because the company (a) engages in the exploration, production, utilization, transportation, sale, or manufacturing of fossil fuel-based energy and does not commit or pledge to meet environmental standards beyond applicable federal and state law, or (b) does business with a company described by paragraph (a)." See TEX. GOV'T CODE § 809.001(1).

Name of Company/Firm: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City/State/Zip: \_\_\_\_\_

Email Address: \_\_\_\_\_

Prepare By: \_\_\_\_\_

Company Official's Name: \_\_\_\_\_  
Printed

Company Official's Authorized Signature: \_\_\_\_\_

TITLE \_\_\_\_\_

TELEPHONE NUMBER \_\_\_\_\_ DATE \_\_\_\_\_

## Submit with Part 1

### XXVIII. EXHIBIT O – CERTIFICATION PROHIBITING DISCRIMINATION AGAINST FIREARM AND AMMUNITION INDUSTRIES

If (a) Vendor is not a sole proprietorship; (b) Vendor has at least ten (10) full-time employees; (c) this Agreement has a value of at least \$100,000 that is paid wholly or partly from public funds; (d) the Agreement is not excepted under TEX. GOV'T CODE § 2274.003 of SB 19 (87th leg.); and (e) Owner has determined that Vendor is not a sole-source provider or Owner has not received any bids from a company that is able to provide this written verification, the following certification shall apply; otherwise, this certification is not required. Pursuant to TEX. GOV'T CODE Ch. 2274 of SB 19 (87th session), Vendor hereby certifies and verifies that Vendor, or association, corporation, partnership, joint venture, limited partnership, limited liability partnership, or limited liability company, including a wholly owned subsidiary, majority-owned subsidiary parent company, or affiliate of these entities or associations, that exists to make a profit, does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association and will not discriminate during the term of this contract against a firearm entity or firearm trade association. For purposes of this Agreement, "discriminate against a firearm entity or firearm trade association" shall mean, with respect to the entity or association, to: "(1) refuse to engage in the trade of any goods or services with the entity or association based solely on its status as a firearm entity or firearm trade association; (2) refrain from continuing an existing business relationship with the entity or association based solely on its status as a firearm entity or firearm trade association; or (3) terminate an existing business relationship with the entity or association based solely on its status as a firearm entity or firearm trade association." See TEX. GOV'T CODE § 2274.001(3) of SB 19. "Discrimination against a firearm entity or firearm trade association" does not include: "(1) the established policies of a merchant, retail seller, or platform that restrict or prohibit the listing or selling of ammunition, firearms, or firearm accessories; and (2) a company's refusal to engage in the trade of any goods or services, decision to refrain from continuing an existing business relationship, or decision to terminate an existing business relationship to comply with federal, state, or local law, policy, or regulations or a directive by a regulatory agency, or for any traditional business reason that is specific to the customer or potential customer and not based solely on an entity's or association's status as a firearm entity or firearm trade association." See TEX. GOV'T CODE § 2274.001(3) of SB 19.

Name of Company/Firm: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City/State/Zip: \_\_\_\_\_

Email Address: \_\_\_\_\_

Prepare By: \_\_\_\_\_

Company Official's Name: \_\_\_\_\_

Printed

Company Official's Authorized Signature: \_\_\_\_\_

TITLE \_\_\_\_\_

TELEPHONE NUMBER \_\_\_\_\_ DATE \_\_\_\_\_

## Submit with Part 1

### XXIX. EXHIBIT P – CERTIFICATION REGARDING CERTAIN FOREIGN-OWNED COMPANIES IN CONNECTION WITH CRITICAL INFRASTRUCTURE

Owner is prohibited from entering into a contract or other agreement relating to critical infrastructure that would grant to Vendor direct or remote access to or control of critical infrastructure in this state, excluding access specifically allowed by Owner for product warranty and support purposes. Vendor certifies that neither it nor its parent company nor any affiliate of Vendor or its parent company, is (1) owned by or the majority of stock or other ownership interest of the company is held or controlled by individuals who are citizens of China, Iran, North Korea, Russia, or a designated country; (2) a company or other entity, including governmental entity, that is owned or controlled by citizens of or is directly controlled by the government of China, Iran, North Korea, Russia, or a designated country; or (3) headquartered in China, Iran, North Korea, Russia, or a designated country. For purposes of this Agreement, “critical infrastructure” means “a communication infrastructure system, cybersecurity system, electric grid, hazardous waste treatment system, or water treatment facility.” See TEX. GOV'T CODE § 2274.0101(2) of SB 1226 (87th leg.). Vendor verifies and certifies that Vendor will not grant direct or remote access to or control of critical infrastructure, except for product warranty and support purposes, to prohibited individuals, companies, or entities, including governmental entities, owned, controlled, or headquartered in China, Iran, North Korea, Russia, or a designated country, as determined by the Governor.

If Respondent is not a governmental body and (a) this Agreement has a stated expenditure of at least \$1 million in public funds for the purchase of goods or services by the Owner; or (b) this Agreement results in the expenditure of at least \$1 million in public funds for the purchase of goods or services by the Owner in a fiscal year of the Owner, the following certification shall apply; otherwise, this certification is not required. As required by Tex. Gov't Code § 552.374(b), the following statement is included in the RFP and the Agreement (unless the Agreement is (1) related to the purchase or underwriting of a public security; (2) is or may be used as collateral on a loan; or (3) proceeds from which are used to pay debt service of a public security of loan): “The requirements of Subchapter J, Chapter 552, Government Code, may apply to this RFP and Agreement and the contractor or vendor agrees that the contract can be terminated if the contractor or vendor knowingly or intentionally fails to comply with a requirement of that subchapter.” Pursuant to Subchapter J, Chapter 552, Texas Government Code, the Respondent hereby certifies and agrees to (1) preserve all contracting information related to this Agreement as provided by the records retention requirements applicable to the Owner for the duration of the Agreement; (2) promptly provide to the Owner any contracting information related to the Agreement that is in the custody or possession of the Respondent on request of the Owner; and (3) on completion of the Agreement, either (a) provide at no cost to the Owner all contracting information related to the Agreement that is in the custody or possession of Respondent, or (b) preserve the contracting information related to the Agreement as provided by the records retention requirements applicable to the Owner.

Name of Company/Firm: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City/State/Zip: \_\_\_\_\_

Email Address: \_\_\_\_\_

Prepared By: \_\_\_\_\_

Company Official's Name: \_\_\_\_\_

## Submit with Part 1

Printed

Company Official's Authorized Signature: \_\_\_\_\_

TITLE \_\_\_\_\_

TELEPHONE NUMBER \_\_\_\_\_ DATE \_\_\_\_\_

## Submit with Part 1

### XXX. EXHIBIT P – ANTITRUST CERTIFICATIONS STATEMENT (TEX. GOVERNMENT CODE § 2155.005)

I affirm under penalty of perjury of the laws of the State of Texas that:

1. I am duly authorized to execute this contract on my own behalf or on behalf of the company, corporation, firm, partnership or individual (Company) listed below;
2. In connection with this bid, neither I nor any representatives of the Company have violated any provision of the Texas Antitrust laws codified in Tex. Bus. & Comm. Code Chapter 15;
3. In connection with this bid, neither I nor any representative of the Company have violated any federal antitrust law; and
4. Neither I nor any representatives of the Company have directly or indirectly communicated any of the contents of this bid to a competitor of the Company or any other company, corporation, firm, partnership or individual engaged in the same line of business as the Company.

Name of Company/Firm: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City/State/Zip: \_\_\_\_\_

Email Address: \_\_\_\_\_

Prepared By: \_\_\_\_\_

Company Official's Name: \_\_\_\_\_  
Printed

Company Official's Authorized Signature: \_\_\_\_\_

TITLE \_\_\_\_\_

TELEPHONE NUMBER \_\_\_\_\_ DATE \_\_\_\_\_

## Submit with Part 1

### XXXI. EXHIBIT Q – CONFLICT OF INTEREST DISCLOSURE STATEMENT

The Owner is required to comply with Texas Local Government Code Chapter 176, Disclosure of Certain Relationships with Local Government Officers. House Bill 23 significantly changed Chapter 176 as well as the required disclosures and the corresponding forms. As of September 1, 2015, any vendor who does business with the Owner or who seeks to do business with the Owner must fill out the new Conflict of Interest Questionnaire (CIQ) whether or not a conflict of interest exists. A conflict of interest exists in the following situations:

1. If the vendor has an employment or other business relationship with a local government officer of the Owner or a family member of the officer, as described by section 176.003(a)(2)(A) of the Texas Local Government Code; or
2. If the vendor has given a local government officer of the Owner, or a family member of the officer, one or more gifts with the aggregate value of \$100, excluding any gift accepted by the officer or a family member of the officer if the gift is: (a) a political contribution as defined by Title 15 of the Election Code; or (b) a gift of food accepted as a guest; or
3. If the vendor has a family relationship with a local government officer of the Owner.

**“Vendor”** means a person who enters or seeks to enter into a contract with a local governmental entity. The term includes an agent of a vendor. The term includes an officer or employee of a state agency when that individual is acting in a private capacity to enter into a contract. The term does not include a state agency except for Texas Correctional Industries. *Texas Local Government Code 176.001(7).*

**“Business relationship”** means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on: (A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity; (B) a transaction conducted at a price and subject to terms available to the public; or (C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency. *Texas Local Government Code 176.001(3).*

**“Family relationship”** means a relationship between a person and another person within the third degree by consanguinity or the second degree by affinity, as those terms are defined by Subchapter B, Chapter 573, Government Code. *Texas Local Government Code 176.001(2-a).*

**“Local government officer”** means: (A) a member of the governing body of a local governmental entity; (B) a director, superintendent, administrator, president, or other person designated as the executive officer of a local governmental entity; or (C) an agent of a local governmental entity who exercises discretion in the planning, recommending, selecting, or contracting of a vendor. *Texas Local Government Code 176.001(4).*

#### **Owner Board of Trustees include:**

Mr. Lee McLeod – President  
Mr. John E. McStravick – Vice President  
Mr. Justin Unser – Secretary  
Mr. Mark Lewandowski – Assistant Secretary  
Dr. Michael J. Pratt – Trustee  
Mrs. Tina Salem – Trustee  
Mr. Matt Schiel - Trustee

#### **Owner Superintendent:**

Dr. Martha Salazar-Zamora



## **Submit with Part 1**

**If no conflict of interest exists, you must fill out Box 1 and type N/A on Box 3 of the CIQ form, sign and date it.**

In the event of changed circumstances, an updated CIQ must be filed within seven (7) business days after the vendor becomes aware that a conflict of interest exists.

## Submit with Part 1

### CONFLICT OF INTEREST QUESTIONNAIRE For vendor doing business with local governmental entity

A complete copy of Chapter 176 of the Local Government Code may be found at <http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.176.htm>. For easy reference, below are some of the sections cited on this form.

**Local Government Code § 176.001(1-a):** "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

- (A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;
- (B) a transaction conducted at a price and subject to terms available to the public; or
- (C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

**Local Government Code § 176.003(a)(2)(A) and (B):**

- (a) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

\*\*\*

- (2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds \$2,500 during the 12-month period preceding the date that the officer becomes aware that

- (i) a contract between the local governmental entity and vendor has been executed; or
- (ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than \$100 in the 12-month period preceding the date the officer becomes aware that:

- (i) a contract between the local governmental entity and vendor has been executed; or
- (ii) the local governmental entity is considering entering into a contract with the vendor.

**Local Government Code § 176.006(a) and (a-1)**

- (a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

- (1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);
- (2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or
- (3) has a family relationship with a local government officer of that local governmental entity.

(a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

- (1) the date that the vendor:
  - (A) begins discussions or negotiations to enter into a contract with the local governmental entity; or
  - (B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or
- (2) the date the vendor becomes aware:
  - (A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);
  - (B) that the vendor has given one or more gifts described by Subsection (a); or
  - (C) of a family relationship with a local government officer.

## Submit with Part 2

Company Name: \_\_\_\_\_

### TAB L – INCLUDES SECTION XXXII - XXXIII

#### XXXII. EXHIBIT R – BID ALTERNATES AND UNIT PRICE FORM

**Alternates:** If the Owner elects to accept any or all of the Alternates, the undersigned agrees to modify the Base Proposal as stipulated. **Circle Add or Deduct** for each Alternate below. **IF YOU DO NOT NOTE ADD/DEDUCT, WE MUST ASSUME AN ADD.**

**Alternate NO. 1:** Omit Practice Gym (RM 900) and associated exterior walls, flooring, roofing, structural elements, and utilities as specified as shown on the drawings.

Add/Deduct \_\_\_\_\_ Dollars  
(Amount written in words governs)

\$ \_\_\_\_\_ (Amount in figures)

**Alternate NO. 2:** Provide optional adjustment to Base Proposal.

Add/Deduct \_\_\_\_\_ Dollars  
(Amount written in words governs)

\$ \_\_\_\_\_ (Amount in figures)

**Alternate NO. 3:** Chiller Manufacturers:

Alternate 3A – Carrier

Add/Deduct \_\_\_\_\_ Dollars  
(Amount written in words governs)

\$ \_\_\_\_\_ (Amount in figures)

Alternate 3B – Trane

Add/Deduct \_\_\_\_\_ Dollars  
(Amount written in words governs)

\$ \_\_\_\_\_ (Amount in figures)

## Submit with Part 2

Company Name:\_\_\_\_\_

### **Alternate NO. 4:** AHU Manufacturers:

Alternate 4A – Carrier

Add/Deduct \_\_\_\_\_Dollars  
(Amount written in words governs)

\$ \_\_\_\_\_(Amount in figures)

Alternate 4B – Trane

Add/Deduct \_\_\_\_\_Dollars  
(Amount written in words governs)

\$ \_\_\_\_\_(Amount in figures)

### **Alternate NO. 5:** Cost to provide Refrigerant Recovery/Storage System and Tube Bundle Brushing Machine per specification section 23 6416 Centrifugal Water Chillers Article 2.04 and 2.05.

Add/Deduct \_\_\_\_\_Dollars  
(Amount written in words governs)

\$ \_\_\_\_\_(Amount in figures)

## Submit with Part 2

Company Name: \_\_\_\_\_

**Unit Price:** The undersigned further agrees that in case adjustments to the work or material is authorized from what is shown in the Contract the following Unit Prices will be used in adjusting the Contract Price. Work shall be in conformance with the Contract Documents. **All unit prices shall live as priced for the duration of the contract without further negotiation for any reason.**

### **UNIT PRICE 1: ELECTRICAL DUPLEX RECEPTACLE**

Provide unit price for a new 20A, 120V duplex electrical receptacle and cover plate, flush mounted in a CMU, metal stud, or demountable wall construction, circuited to an existing electrical panel within 150 feet of the outlet using a branch circuit consisting of 2 #10 AWG and 1 #10 AWG ground in 3/4 inch EMT conduit. All conduits to be concealed in wall construction. Unit price shall include a 20 amp circuit breaker to be installed in existing panel space. \$\_\_\_\_\_ each

### **UNIT PRICE 2: DATA DROP**

Provide unit price for a data drop, flush mounted in a CMU, metal stud or demountable wall construction., wired to an IDF/MDF Room. The data drop shall consist of a single gang wall box, cabling wiring device, cover plate, 3/4 inch conduit from outlet to above accessible ceiling, plenum-rated cabling routed above accessible ceiling to the nearest MDF or IDF location within 250 feet of the outlet. Termination and testing to be included in the unit price. \$\_\_\_\_\_ each

### **UNIT PRICE 3: VOICE DROP**

Provide unit price for a voice drop, flush mounted in a CMU, metal stud or demountable wall construction., wired to the telecommunications/MDF room. The voice drop shall consist of a single gang wall box, voice jack, cover plate, 3/4 inch conduit from outlet to above accessible ceiling, plenum-rated voice cable routed above accessible ceiling to telecommunication head end equipment. Termination and testing to be included in the unit price.

\$\_\_\_\_\_ each

### **UNIT PRICE 4: 4 ½" THICK CONCRETE WALK PER SQUARE FOOT**

This unit cost shall establish the amount to the contract price for the Contractor to add or deduct 4 ½" thick concrete walk (minimum 100 SF) per Square Foot.

\$\_\_\_\_\_ each

### **UNIT PRICE 5: 7" THICK CONCRETE DRIVE PER SQUARE FOOT**

This unit cost shall establish the amount to the contract price for the Contractor to add or deduct 7" thick concrete drive (minimum 100 SF) per Square Foot.

\$\_\_\_\_\_ each

### **UNIT PRICE 6: LIFE SAFETY DEVICES** (including all associated cabling and programming)

## Submit with Part 2

Company Name:\_\_\_\_\_

This unit cost shall establish the amount to be added or deducted from the contract price for the Contractor to add /deduct Fire Alarm devices.

- |                                   |         |      |
|-----------------------------------|---------|------|
| 1. Exterior Horn To Speaker       | \$_____ | each |
| 2. Interior Horn To Speaker       | \$_____ | each |
| 3. Interior Visual Strobe         | \$_____ | each |
| 4. Interior Speaker/Visual Strobe | \$_____ | each |
| 5. Smoke Detector                 | \$_____ | each |
| 6. Heat Detector                  | \$_____ | each |
| 7. Manual Pull Station            | \$_____ | each |
| 8. Stopper 2 Pull Station Cover   | \$_____ | each |
| 9. Annunciator Panel              | \$_____ | each |
| 10. Duct Detector                 | \$_____ | each |
| 11. Relay                         | \$_____ | each |
| 12. Supervisory                   | \$_____ | each |
| 13. Waterflow                     | \$_____ | each |
| 14. Amplifier                     | \$_____ | each |
| 15. Remote Power Supply           | \$_____ | each |

### **UNIT PRICE 7: 4" RESILIENT BASE 100 LINEAR FEET**

This unit cost shall establish the amount to be added or deducted to the contract price for the Contractor to properly remove existing base and install 4" resilient base.

\$\_\_\_\_\_ each

### **UNIT PRICE 8: GRAPHIC SIGNS**

This unit cost shall establish the amount to be added or deducted to the contract price for the Contractor to remove existing signage and install new as described below:

- |                                       |         |      |
|---------------------------------------|---------|------|
| 1. Sign Type A                        | \$_____ | each |
| 2. Sign Type B                        | \$_____ | each |
| 3. Sign Type C                        | \$_____ | each |
| 4. Sign Type D                        | \$_____ | each |
| 5. Sign Type E                        | \$_____ | each |
| 6. Sign Type F                        | \$_____ | each |
| 7. Max Occupancy Signage              | \$_____ | each |
| 8. FDC Connection Signage             | \$_____ | each |
| 9. Wayfinding Signage (2 lines text)  | \$_____ | each |
| 10. Wayfinding Signage (3 lines text) | \$_____ | each |
| 11. Wayfinding Signage (4 lines text) | \$_____ | each |

### **UNIT PRICE 11: EXIT SIGN**

## Submit with Part 2

Company Name: \_\_\_\_\_

This unit cost shall establish the amount to be added to the contract price to provide and install one (1) exit sign. Price shall include wiring to nearest available emergency circuit, up to 200 feet.

\$\_\_\_\_\_ each

### **UNIT PRICE 13: SECURITY FILM**

This unit cost shall establish the amount to be added to the contract price to provide and install security film on existing exterior glazing (minimum 200 square feet).

- |                 |         |             |
|-----------------|---------|-------------|
| 1. Armor Glass  | \$_____ | Square foot |
| 2. Saint Gobain | \$_____ | Square foot |
| 3. 3M           | \$_____ | Square foot |

### **UNIT PRICE 14: Topsoil**

Each 1,000 square yards of prepared topsoil, 2" uniform depth

\$\_\_\_\_\_ Square yard

### **Unit Price NO. 15: Backfill Offsite Sources**

Each cubic yard of backfilling, meeting fill requirements of construction documents, compacted in lifts as required by construction documents.

\$\_\_\_\_\_ Square yard

### **Unit Price NO. 16: Backfill Onsite Sources**

Each cubic yard of backfilling, meeting fill requirements of construction documents, compacted in lifts as required by construction documents.

\$\_\_\_\_\_ Square yard

### **Unit Price NO. 17: Concrete Poured from Truck**

Each cubic yard structural concrete, off the truck, no pumping, placement, or finishing. as required by construction documents.

\$\_\_\_\_\_ Square yard

### **Unit Price NO. 18: Concrete Pumped**

Each cubic yard structural concrete, as required by construction documents.

\$\_\_\_\_\_ Square yard

## Submit with Part 2

Company Name: \_\_\_\_\_

### **Unit Price NO. 19: Fire Protection**

Each fire protection sprinkler head installed in acoustic tile ceiling, including twenty feet of piping, tee, elbow, head, hangers, flex, complete assembly, installed (using type of system described in construction documents as base bid)

\$ \_\_\_\_\_ Ea.

### **Unit Price NO. 20: Exterior Fire Horn Device**

Each exterior fire horn device, including J-box, conduit, cabling, weatherproofing, as required by the Contract Documents.

\$ \_\_\_\_\_ Ea.

### **Unit Price NO. 21: Interior Fire Horn/Strobe**

Each interior fire horn/strobe device, including J-box, conduit, and cabling, as required by the Contract Documents.

\$ \_\_\_\_\_ Ea.

### **Unit Price NO. 22: Interior Fire Voice/Strobe Device**

Each interior fire voice/strobe device, including J-box, conduit, and cabling, as required by the Contract Documents.

\$ \_\_\_\_\_ Ea.

### **Unit Price NO. 23: Interior Smoke Detector**

Each interior smoke detector device, including J-box, conduit, and cabling, as required by the Contract Documents.

\$ \_\_\_\_\_ Ea.

### **Unit Price NO. 24: Interior Pull Station**

Each interior pull station device, including J-box, conduit, and cabling, as required by the Contract Documents.

\$ \_\_\_\_\_ Ea.

### **Unit Price NO. 25: Interior Heat Detector**

Each interior heat detector device, including J-box, conduit, and cabling, as required by the Contract Documents.



## Submit with Part 2

Company Name:\_\_\_\_\_

\$\_\_\_\_\_ Ea.

### **Unit Price NO. 26: Interior Emergency Exit Device**

Each interior emergency exit sign device, including J-box, conduit, and cabling, as required by the Contract Documents.

\$\_\_\_\_\_ Ea.

Company:\_\_\_\_\_

Address:\_\_\_\_\_

City

ST

Zip

Telephone:\_\_\_\_\_ Fax:\_\_\_\_\_ Email:\_\_\_\_\_

Printed Name/Title:\_\_\_\_\_ Signature:\_\_\_\_\_

State whether firm is a: ☐ Corporation ☐ Partnership ☐ Individual

**Submit with Part 2**

Company Name:\_\_\_\_\_

**XXXIII. EXHIBIT S – KEY SUBCONTRACTORS**

The Owner reserves the right to select key subcontractors from the list below. Base bid shall include the subcontractor listed first in all cases. If the Owner selects a vendor other than the base bid subcontractor, the General Contractor agrees to modify their proposal to incorporate those cost adjustments by the value listed below only. No additional markup for change for scope may be made.

Provide the names of the (3) top bidding key subcontractors used in the preparation of your proposal.

**Structural Concrete**

1. Vendor \$
2. Vendor \$
3. Vendor \$

**Mechanical**

1. Vendor \$
2. Vendor \$
3. Vendor \$

**Electrical**

1. Vendor \$
2. Vendor \$
3. Vendor \$

**Plumbing**

1. Vendor \$
2. Vendor \$
3. Vendor \$

**Roofing**

1. Vendor \$
2. Vendor \$
3. Vendor \$

## Submit with Part 2

Company Name:\_\_\_\_\_

### **Data Cabling**

- |           |    |
|-----------|----|
| 1. Vendor | \$ |
| 2. Vendor | \$ |
| 3. Vendor | \$ |

### **Fire Alarm**

- |           |    |
|-----------|----|
| 1. Vendor | \$ |
| 2. Vendor | \$ |
| 3. Vendor | \$ |

### **Building Automation**

- |           |    |
|-----------|----|
| 1. Vendor | \$ |
| 2. Vendor | \$ |
| 3. Vendor | \$ |

### **Self-Performed Work List all Self-Performed work. Provide pricing for Subcontractors for the same work scope.**

- |           |    |
|-----------|----|
| 1. Vendor | \$ |
| 2. Vendor | \$ |
| 3. Vendor | \$ |

**XXXIV. EXHIBIT T – PREVAILING WAGE RATES**

**Prevailing Wage Rates - School Construction Trades  
Effective March 1, 2016  
Texas Gulf Coast Area**

<b>CLASSIFICATION</b>	<b>HOURLY RATE</b>
Asbestos Worker	\$15.42
Bricklayers; Masons	\$18.34
Carpenters/Caseworker	\$21.50
Carpet Layers/Floor Installers	\$20.03
Concrete Finishers	\$16.13
Data Comm / Telecom Installer	\$23.50
Drywall Installers; Ceiling Installers	\$16.69
Electricians	\$22.44
Elevator Mechanics	\$30.00
Fire Proofing Installer	\$19.13
Glaziers	\$19.87
Heavy Equipment Operators	\$18.18
Insulators	\$16.16
Ironworkers	\$18.14
Laborers	\$11.81
Lather / Plasterer	\$18.03
Light Equipment Operators	\$15.21
Metal Building Assemblers	\$17.53
Millwrights	\$20.69
Painters/Wall Covering Installers	\$15.75
Pipefitters	\$25.70
Plumbers	\$26.50
Roofers	\$18.80
Sheet Metal Workers	\$20.46
Sprinkler Fitters	\$25.10
Steel Erector	\$19.33
Terrazzo Workers	\$19.67
Tile Setters	\$19.83
Waterproofers/Caulkers	\$19.00

This document was developed by PBK Architects, Inc. in strict accordance with the Texas Government Code Chapter 2258.

**Prevailing Wage Rates  
Worker Classification Definition Sheet**

Asbestos Worker	Worker who removes & disposes of asbestos materials.
Bricklayers/Masons	Craftsman who works with masonry products, stone, brick, block or any material substituting for those materials & accessories.
Carpenter / Caseworker	Worker who builds wood structures or structures of any material which has replaced wood. Includes rough & finish carpentry, hardware and trim.
Carpet Layer / Floor Installer	Worker who installs carpets and/or floor coverings-vinyl tile.
Concrete Finisher	Worker who floats, trowels and finishes concrete.
Data Comm / Telecom Installer	Worker who installs data/telephone & television cable and associated equipment and accessories.
Drywall / Ceiling Installer	Worker who installs metal framed walls & ceilings, drywall coverings, ceiling grids & ceilings.
Electrician	Skilled craftsman who installs or repairs electrical wiring & devices. Includes fire alarm systems & HVAC electrical controls.
Elevator Mechanic	Craftsman skilled in the installation & maintenance of elevators.
Fire Proofing Installer	Worker who sprays or applies fire proofing materials.
Glazier	Worker who installs glass, glazing and glass framing.
Heavy Equipment Operator	Includes, but not limited to, all Cat tractors, all derrick-powered, all power operated cranes, back-hoe, back-filler, power operated shovel, winch truck, all trenching machines.
Insulator	Worker who applies, sprays or installs insulation.
Iron Worker	Skilled craftsman who erects structural steel framing & installs structural concrete Rebar.
Laborer / Helper	Worker qualified for only unskilled or semi-skilled work. Lifting, carrying materials & tools, hauling, digging, clean-up.
Lather / Plasterer	Worker who installs metal framing & lath. Worker who applies plaster to lathing and installs associated accessories.
Light Equipment Operator	Includes, but not limited to, air compressors, truck crane driver, flex plane, building elevator, form grader, concrete mixer (less than 14cf), conveyer.
Metal Building Assembler	Worker who assembles pre-made metal buildings.
Millwright	Mechanic specializing in the installation of heavy machinery, conveyance, wrenches, dock levelers, hydraulic lifts & align pumps.
Painter / Wall Covering Installer	Worker who prepares wall surfaces & applies paint and/or wall coverings, tape and bedding.
Pipefitter	Trained worker who installs piping systems, chilled water piping & hot water (boiler) piping, pneumatic tubing controls, chillers, boilers & associated mechanical equipment.
Plumber	Skilled craftsman who installs domestic hot & cold water piping, waste piping, storm system piping, water closets, sinks, urinals, and related work.
Roofer	Worker who installs roofing materials, Bitumen (asphalt & coal tar) felts, flashings, all types roofing membranes & associated products.
Sheet Metal Worker	Worker who installs sheet metal products. Roof metal, flashings & curbs, ductwork, mechanical equipment and associated metals.
Sprinkler Fitter	Worker who installs fire sprinkler systems & fire protection equipment.
Steel Erector	Worker who erects and dismantles structural steel frames of buildings and other structures
Terrazzo Worker	Craftsman who places & finishes Terrazzo.
Tile Setter	Worker who prepares wall and/or floor surfaces & applies ceramic tiles to these surfaces.
Waterproofing / Caulker	Worker who applies water proofing material to buildings. Products include sealant, caulk, sheet membrane, liquid membranes, sprayed, rolled or brushed.

**END OF DOCUMENT**

This document was developed by PBK Architects, Inc. in strict accordance with the Texas Government Code Chapter 2258.

**XXXV. EXHIBIT U - AIA DOCUMENT A101-2017**  
TO BE ISSUED VIA ADDENDUM

**XXXVI. EXHIBIT V - AIA DOCUMENT A201-2017**  
TO BE ISSUED VIA ADDENDUM





**SECTION 00 3132  
GEOTECHNICAL DATA**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Related Documents: General and Supplementary Conditions of the Contract, Division 01 General Requirements, and Drawings are applicable to this Section.

**1.02 INVESTIGATION**

- A. An investigation of subsurface soil conditions at the building site was authorized by the Owner, and these investigations were made by Alpha Testing, inc., report number H223322-Final , dated August 3, 2023.

**1.03 REPORT**

- A. The complete report of the testing laboratory follows this section and is provided for information only.
- B. Report and log of borings are available for Contractor's information but is not a warranty of subsurface conditions, nor is it a part of the Contract Documents.

**1.04 RESPONSIBILITY**

- A. Bidders are expected to examine the site and subsurface investigation reports and then decide for themselves the character of the materials to be encountered.
- B. The Owner and Architect assume no responsibility for variations of subsoil quality or conditions.
- C. The Owner and the Architect assume no responsibility for any conclusions or interpretations made on the basis of subsurface information contained in the contract documents.

**PART 2 - NOT USED**

**PART 3 - NOT USED**

**END OF SECTION**



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**GEOTECHNICAL EXPLORATION**

**TISD JUERGEN ROAD HIGH SCHOOL**  
Off Mueschke Road and Cypress Height Drive  
Tomball, Texas  
ALPHA Report No. H223322-Final  
August 03, 2023

Prepared for:

**TOMBALL ISD**  
310 South Cherry  
Tomball, Texas 77375  
Attention: Robert W. Wilbanks

Prepared By:



August 03, 2023

**Tomball ISD**  
310 South Cherry  
Tomball, Texas 77375  
Attention: Robert W. Wilbanks

Re: Geotechnical Exploration  
**TISD Juergen Road High School**  
Off Mueschke Road and Cypress Height Drive  
Tomball, Texas  
ALPHA Report No. H223322-Final

Attached is the report of the geotechnical exploration performed for the project referenced above. This study was authorized by Mr. Jim Ross through an AIA Agreement dated November 10, 2022, and performed in general accordance with ALPHA Proposal No. 93827-Rev, dated November 11, 2022. Sixty-seven (67) borings were originally proposed and drilled for this study. Eighteen (18) additional borings were drilled due to relocation of the school building. A Phase I Geologic Fault Study was submitted under a separate cover as ALPHA Report No. H223322-2, dated April 03, 2023.

This report contains results of field explorations and laboratory testing and an engineering interpretation of these with respect to available project characteristics. The results and analyses were used to develop recommendations to aid design and construction of high school building foundations, other small structures, tennis courts, athletic fields, and parking and driveways.

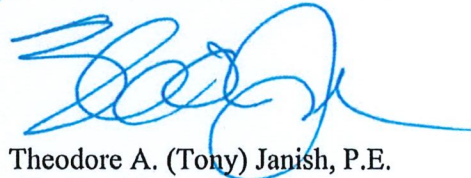
ALPHA TESTING, LLC appreciates the opportunity to be of service on this project. If we can be of further assistance, such as providing materials testing services during construction, please contact our office.

Sincerely,

**ALPHA TESTING, LLC**



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## **1.0 PURPOSE AND SCOPE**

The purpose of this geotechnical exploration is for ALPHA TESTING, LLC (“ALPHA”) to evaluate for Tomball ISD (“Client”) some of the physical and engineering properties of subsurface materials at selected locations on the subject site with respect to formulation of geotechnical design parameters for the proposed construction. The field exploration was accomplished by securing subsurface samples from widely spaced borings performed across the project site. Engineering analyses were performed from results of the field exploration and results of laboratory tests performed on representative samples.

Also included are general comments pertaining to reasonably anticipated construction problems and recommendations concerning earthwork and quality control testing during construction. This information can be used to evaluate subsurface conditions and to aid in ascertaining whether the construction meets project specifications.

Recommendations provided in this report were developed from information obtained in borings depicting subsurface conditions only at the specific boring locations and at the particular time designated on the Log of Boring sheets. Subsurface conditions at other locations may differ from those observed at the boring locations, and subsurface conditions at the boring locations may vary at different times of the year. The scope of work may not fully define the variability of subsurface materials and conditions that are present on the site.

The nature and extent of variations between borings may not become evident until construction. If significant variations then appear evident, our office should be contacted to re-evaluate our recommendations after performing on-site observations and possibly other tests.

## **2.0 PROJECT CHARACTERISTICS**

It is proposed to construct an approximately 390,000 SF new high school building, athletic fields, light poles, tennis courts, other small structures, and associated parking and driveways. The project site is located off proposed Cypress Height Drive, about 0.8 miles south of Juergens Road and about 0.3 miles east of Mueschke Road in Tomball, Texas. A vicinity map showing the project’s general location is provided as Figure A-1, in Appendix A of this report. At the time of the field explorations, the project site was covered with weeds and grass.

We understand the high school building structural service loads will be in the order of 300 kips. Based on the topographic survey provided by the client, the existing grade within the main high school building is about Elevation 175 to 177 ft. We understand the finish floor elevation will be at 180 ft. This will result in fill of about 3 to 5 ft to achieve the final grade within the main high school building area. From our discussions with TISD representatives, we understand it is generally desired to support the buildings on shallow foundations and to support the floor slabs on-grade.

## **3.0 FIELD EXPLORATION**

Subsurface conditions were explored by drilling 85 borings to depths of 5 to 75 ft. The borings were drilled in general accordance with ASTM D420 using standard rotary drilling equipment.

The approximate location of each test boring is shown on the Boring Location Plan, Figure A-2,



in Appendix A of this report. Details of drilling and sampling operations are briefly summarized in Methods of Field Exploration, Figure A-3 in Appendix A of this report.

Subsurface conditions observed during the field exploration are presented on the boring logs, in Appendix A of this report. The boring logs contain our field and laboratory test results, as well as our Field Technician's and Engineer's interpretation of conditions believed to exist between actual samples retrieved. Therefore, these boring logs contain both factual and interpretive information. Lines delineating subsurface strata on the boring logs are intended to group soils having similar engineering properties and characteristics. They should be considered approximate as the actual transition between soil types (strata) may be gradual. A Key to Soil Symbols and Classifications used on the boring logs is presented in Appendix A of this report.

#### **4.0 LABORATORY TESTS**

Selected samples of the subsurface materials were tested in the laboratory to evaluate certain engineering properties as a basis in providing recommendations for foundation design and earthwork construction. A brief description of testing procedures used in the laboratory can be found on Figure A-4 Methods of Laboratory Testing, in Appendix A of this report. Individual test results are presented on the boring log sheets enclosed in Appendix A.

#### **5.0 GENERAL SUBSURFACE CONDITIONS**

##### **5.1 Local Geology**

Based on a review of literature and public maps in our library, as well as our experience, the project site lies within the Coastal Prairies Province of the Gulf Coastal Plains Physiographic Region of Texas and is underlain by soils common to the Lissie Formation.

The Lissie Formation is approximately early Pleistocene in age. The Lissie outcrop is continuous except where cut by modern river valleys, or where covered by Holocene windblown deposits in South Texas. At outcrop, the Lissie Formation is composed of fine-grained sand and sandy clay and unconformably overlies and onlaps the Willis Formation. In the subsurface, the Lissie is defined as the interval between the Willis and the Beaumont Formations. The Lissie is dominated by non-marine depositional systems in the onshore part of the Texas Coastal Plain, although shore-zone facies are prominent in some coastal counties. Lissie Formation deposition was strongly influenced by glacial-interglacial cycles on the North American continent. High-frequency, glacio-eustatic, sea-level fluctuations resulted in shorter depositional episodes, thinner genetic sequences, and greater erosional downcutting.

The Lissie Formation ranges in thickness from about 100 ft at outcrop to greater than 700 ft at the coast. The Lissie Formation dips coastward about 5 to 20 ft per mile, and is 500 to 1,000 ft deep at the modern shoreline. Lissie Formation depositional facies patterns are similar to those of the Willis Formation, and include dip-oriented fluvial channel sands separated by interchannel muds, and grading downdip into shore-parallel sands and muds. In Lissie fluvial systems, individual sand bodies are 20 to 100 ft thick, whereas interbedded muds are generally less than 20 ft thick. In general, the Lissie Formation is less sandy than the Willis Formation.





## **5.2 Subsurface Stratigraphy**

In general, layers of sandy lean clay (CL), lean clay (CL), sandy silty clay (CL-ML), sandy silt (ML), silty sand (SM), clayey sand (SC), poorly graded sand (SP), sandy fat clay (CH), and/or fat clay (CH) were encountered from the ground surface extending to the boring termination depths of 5 to 75 ft.

The letters in parenthesis represent the soils' classification according to the Unified Soil Classification System (ASTM D 2488). More detailed stratigraphic information is presented on the Logs of Boring sheets attached to this report.

## **5.3 Depth-to-Water**

Borings were drilled using dry-auger techniques to measure depth-to-water in the open boreholes. Free water was encountered in Borings B-1, B-2, B-3, B-5 through B-11, B-15, B-17, B-19, B - 21, and B-68 through B-85 at depths of 18 to 43 ft below the existing ground surface during drilling and immediately after the completion of drilling operations. Perched water was encountered at depths of about 2 to 10 ft in Borings B-7, B-58, B-69, B-74, B-78, B-83, and B-84. Free water was not encountered in the remaining borings.

The granular soils (silty sand, sandy silt, poorly graded sand, and clayey sand) encountered in the borings are considered relatively permeable and are anticipated to have a rapid response to water movement. However, the sandy clay and clay soils encountered in the borings are considered relatively impermeable and are expected to have a relatively slow response to water movement. Therefore, several days of observation would be required to evaluate actual groundwater levels within the depths explored. Also, the groundwater level at the site is anticipated to fluctuate seasonally depending on the amount of rainfall, prevailing weather conditions and subsurface drainage characteristics.

## **6.0 DESIGN RECOMMENDATIONS**

The following design recommendations were developed on the basis of the previously described Project Characteristics (Section 2.0) and General Subsurface Conditions (Section 5.0). If project criteria should change, including structure locations on the site, our office should conduct a review to determine if modifications to the recommendations are required. Further, it is recommended our office be provided with a copy of the final plans and specifications for review prior to construction.

The following design criteria given in this report were developed assuming the finish building pad elevation is constructed at elevations discussed in Section 2.0. Substantial cutting and filling on the site (more than discussed in Section 2.0) can alter the recommended foundation design parameters. Therefore, it is recommended our office be contacted before performing other cutting and filling on site to verify the appropriate design parameters are utilized for final foundation design.

### **6.1 Subgrade Improvement for Support of Foundations and Floor Slabs**

A floor slab, slab-on-grade foundations, shallow foundations and flatwork supported at elevation discussed in Section 2.0 could experience soil-related potential seasonal movements of about 1 to





2½ inches. This potential seasonal movement was estimated in general accordance with methods outlined by Texas Department of Transportation (TxDOT) Test Method Tex-124-E, swell tests, engineering judgment, and experience. Estimated movements were calculated assuming the moisture content of the in-situ soil within the normal zone of seasonal moisture content change varies between a “dry” condition and a “wet” condition as defined by Tex-124-E. Also, it was assumed a 1 psi surcharge load from the floor slab acts on the subgrade soils. Movements exceeding those predicted above could occur if the soils are exposed to an extended dry period, positive drainage of surface water is not maintained or if soils are subject to an outside water source, such as leakage from a utility line or subsurface moisture migration from off-site locations.

If some slab movement is tolerable (about ½ or 1 inch), the floor system of buildings and structures could consist of a concrete slab designed to bear uniformly on improved soils. The most appropriate method of subgrade improvement at this site includes over-excavating the existing highly plastic material and/or placement of select, non-expansive material. A minimum of 7 ft of select non-expansive material should be placed beneath the slab for the main school building to reduce the potential movements to ½ inches or less. A minimum of 3 ft of select non-expansive material should be placed beneath the slab of tennis courts, and in any other areas where it is desired to reduce potential movements to 1 inch or less. Select fill is described in Section 7.4 of this report. Some on-site soils may meet the requirements for select, non-expansive material. These soils should be tested to verify they meet the requirements for select fill, and stockpiled for use as select fill.

Any fill in the building pad areas (and any other areas of the site where potential movements will be reduced to ½ inch or 1 inch) below the 3 or 7 ft select fill depth can consist of on-site soils with a plasticity index of 30 or less, provided they are free of organics, debris, or other deleterious material, or select fill.

The select fill should extend throughout the buildings’ limits, at least 5 ft beyond the perimeter of the buildings, at least 2 ft beyond the perimeter of the shallow footings, and under adjoining flatwork. In major entrance areas or areas where movement is considered critical, select material should extend at least 10 ft beyond the perimeter of the building. However, select material extending beyond building lines should be capped with a 1-ft thick layer of clayey type soil (material with a plasticity index of at least 30) compacted as recommended in Section 7.4 to inhibit infiltration of surface water into the select material and below the building.

This improvement procedure will not eliminate future movement of a soil supported floor slab or footings. In choosing this method of slab movement reduction, the Owner is accepting some post construction movement (about ½ or 1 inch) of the slabs.

The use of a vapor retarder should be considered beneath interior concrete floor slabs in areas with moisture sensitive flooring. When conditions warrant the use of a vapor retarder, the slab designer and slab contractor should refer to ACI 302 for procedures and cautions about the use and placement of a vapor retarder.

## **6.2 Shallow Footing Foundation System for School Building and Other Small Structures**

The structural frame for the planned main building and other small structures (including, but not limited to, bleachers, backstops and dugouts, batting cages, concession buildings) may be supported using a shallow footing foundation system bearing on properly compacted and tested



select fill material. Footings may be designed using the applicable net allowable soil bearing pressure in Table A below. In using net pressure, the weight of the footing and backfill over the footing, including the weight of the floor slab need not be considered.

<b>TABLE A</b> <b>Net Allowable Bearing Pressure for Shallow Foundations</b> <b>Following Subgrade Improvement as Outlined in Section 6.1</b>	
<b>Structure</b>	<b>Net Allowable Bearing Pressure</b>
<b>Main High School Building</b> (Where 7 ft of Select Fill is Installed to Reduce Movement to ½ inch)	3.0 ksf
<b>Other Small Buildings and Structures</b> (Where 3 ft of Select Fill is Installed to Reduce Movement to 1 inch)	2.0 ksf

All exterior footings should be located at a depth of at least 2 ft below final exterior grade as measured adjacent to the building. Interior footings may be supported at a nominal depth below the bottom of the floor slabs. In addition, all footings for the main high school building should have at least 3 ft of select fill beneath the foundation element to utilize the design bearing pressure.

Wall footings should have a least dimension of 12 inches in width and column footings should have a least dimension of 18 inches for bearing capacity considerations. Footings subject to lateral forces or overturning should be proportioned such that the soil reaction force acting on the bottom of the footing lies within the middle one-third of the footing.

The resulting total foundation movements (following subgrade improvement to reduce the potential movements to about ½ inch or 1 inch as discussed in Section 6.1) due to foundation loads and from shrinking and swelling of active clays are estimated to be limited and not exceed about ½ or 1 inch, respectively. Differential movements between individual footings can approach total movements. Careful field inspection of footing excavations will contribute substantially to reducing foundation movements.

Careful monitoring during construction is necessary to locate any pockets or seams of unsuitable materials, which might be encountered in excavations for footings. Unsuitable or loose materials encountered at the foundation bearing level, should be removed and replaced with lean concrete (about 2,000 psi strength at 28 days), structural concrete, or compacted TxDOT flexible base (see Section 7.4).

Resistance to sliding will be developed by friction along the base of the footings and passive earth pressure acting on the vertical face of the footing and a key installed in the base of the footings, if required. We recommend a coefficient of base friction of 0.3 be used along the bottom of the footing. The available passive earth resistance on the vertical face of the footing and a key constructed in the base of the footing may be calculated using an allowable passive earth pressure of 100 psf per ft of depth below a depth of 2 ft from adjacent grade for footings bearing against native granular soils. For footings bearing against native clays or properly placed and compacted clay backfill, an allowable uniform passive earth pressure of 500 psf below a depth of 2 ft from adjacent grade may be used.



### **6.3 Drilled-And-Underreamed Pier Foundations for Light Poles, Bleachers, Backstops and Dugouts, Concession Buildings, and Other Small Structures ( Alternative)**

Alternatively, the other small structures associated with the project can be supported using drilled-and-underreamed piers. We recommend these piers bear on native clay soils at a depth of at least 12 ft below the existing grade or final grade, whichever is deeper. Drilled-and-underreamed piers may be designed as end-bearing units using an allowable soil bearing pressure of 4,000 psf. This bearing pressure is based on a factor of safety of at least 3.0 with respect to shearing failure for dead load and total load, respectively. Normal elastic settlement of piers under loading is estimated to be about 1 inch.

*Layers of granular soils (sandy silt, clayey and silty sand) were encountered at various depths in most of the borings. In addition, the clay soils at this site are sandy. These soils are subject to underream and/or sidewall collapse, particularly in the presence of groundwater. Substitution of a straight-shaft pier with the same diameter as the underream could be utilized where underream collapse occurs. Additional comments regarding drilled pier construction are provided in Section 7.3.*

*It is recommended that several test piers be performed prior to construction to verify groundwater conditions and the constructability of underreams. ALPHA should be involved in the discussions and planning for a test pier program. A representative of ALPHA should observe all test piers. Our office should be contacted for further recommendations if underream or sidewall collapse occurs, or if groundwater is encountered. If the test pier program indicates underream pier construction will not be feasible, it will be necessary to utilize an alternative foundation system (such as shallow spread footing foundations, see Section 6.3) for this project.*

Each pier should be designed with full length reinforcing steel to resist the uplift pressure (soil-to-pier adhesion) due to potential soil swell along the shaft from post construction heave and other uplift forces applied by structural loadings. The magnitude of uplift adhesion due to soil swell along the pier shaft cannot be defined accurately and can vary according to the actual in-place moisture content of the soils during construction. We estimate this uplift adhesion will not exceed about 1.0 ksf. This soil adhesion is approximated to act uniformly over the portion of the pier shaft in contact with clayey soils within 10 ft of the final ground surface or to the top of the underream, whichever is less. The uplift adhesion can be neglected for the portion of the shaft in contact with non-expansive fill (select fill) used to grade the building pad area.

Resistance to uplift forces exerted on the drilled piers will be provided by the sustained axial compressive force (dead load) and the allowable uplift resistance provided by the soil located above the pier underreamed bell. The uplift resistance above the bell is dependent upon depth and shape factors applied to the average shear strength of the overlying soils. To resist uplift forces, we recommend the diameter of the underream should be at least two (2) and not exceeding three (3) times the diameter of the shaft. The minimum clear spacing between edges of adjacent piers should be at least one (1) underream diameter, based on the larger underream.

Lateral loads imposed on pier foundations can be resisted by passive resistance in the underlying clay soils. An *allowable uniform passive resistance* of 0.5 ksf can be considered for the clay soils. This allowable passive pressure value has a factor of safety of at least 2. Further, the above resistance values should be applied uniformly over the projected face of the pier. The lateral resistance of the top portion of the pier shafts within 3 ft of final grade should be neglected.



Grade beams may be used to support loads by spanning the drilled-and-underreamed piers. Grade beams should be designed to transfer loads to the piles or piers as a simply supported beam, ignoring any support from the soil between the piers. The depth of exterior and interior grade beams can be varied according to the structural requirements of the floor slab. However, we recommend that exterior grade beams extend at least 12 inches below the lowest adjacent grade. Backfill soils placed adjacent to grade beams must be compacted as outlined in Section 7.4 of this report.

In general, where the subgrade is improved and the floor slab is supported on-grade, we do not recommend the use of void boxes below grade beams and caps because of the potential to collect free water within the void space, especially if replacing the excavated subgrade soils with relatively pervious select fill materials.

#### **6.4 Slab-on-Grade Foundations for Tennis Courts and Other Small Structures**

Slab-on-grade foundation systems can be utilized for the tennis courts and other small structures. Slab foundations constructed within 2 ft of the existing grade tennis courts could experience soil-related potential seasonal movements of up to about 2½ inches. Subgrade improvement procedures as discussed above in Section 6.1 can be performed to reduce soil related potential seasonal movements of the tennis courts to about 1 inch. Potential slab movements can be reduced to about 1 inch by installation of 3 ft of select fill and other associated site grading as described in Section 6.1.

All slab foundations should be designed with exterior and interior grade beams adequate to provide sufficient rigidity to the foundation system. A net allowable soil bearing pressure of 1.5 ksf may be used for design of all grade beams bearing on an improved subgrade as described above in Section 6.1 of this report. Grade beams should bear a minimum depth of 12 inches below final grade and should have a minimum width of 10 inches to utilize the recommended net allowable bearing pressure of the soil.

To reduce cracking as normal movements occur in foundation soils, all grade beams and floor slabs should be adequately reinforced with steel (conventional reinforcing steel and/or post-tension reinforcement). It is common to experience some minor cosmetic distress to structures with slab-on-grade foundation systems due to normal ground movements. A properly designed and constructed moisture barrier (such as a 15 mil vapor barrier) should be placed between the slab and subgrade soils to retard moisture migration through the slabs.

##### **6.4.1 Post-Tensioning Institute, Design of Post-Tensioned Slabs-on-Ground Tennis**

Provided in Table B is information for the design of post-tensioned, slab-on-grade foundations for the concession buildings and tennis courts. Design parameters provided were evaluated based on the conditions encountered in the borings and using information and correlations published by PTI Third Edition and VOLFLO 1.5 computer program provided by Geostructural Tool Kit, Inc. (GTI).



<b>TABLE B</b> <b>Post-Tensioned Slab-on-Ground Design Criteria</b> <b>Potential Seasonal Movement = 1 inch</b> <b>Following Subgrade Improvement as Outlined in Section 6.1</b>		
	<b>EDGE LIFT</b>	<b>CENTER LIFT</b>
Edge Moisture Distance, ft ( $e_m$ )	4.8	7.8
Differential Soil Movement, inches ( $y_m$ )	1.2 (swell)	-0.9 (shrink)

### **6.5 Subgrade Preparation for Track and Field and Other Athletic Fields**

The track and field areas could experience soil-related potential seasonal movements of up to about 2½ inches as discussed in Section 6.1. If this level of movement is unacceptable, the subgrade improvement procedures as discussed in Section 6.1 could be considered for reduction in soil movement in areas where post-construction movements would be critical.

The improvement procedures should extend a minimum of 2 ft beyond the edge of the track and fields. Positive drainage away from the track should be maintained in all areas.

The site should be prepared in accordance with recommendations provided in Section 7.1. Prior to placement of any fill and/or the turf/drainage system, the field should be cleared of all vegetation and proofrolled as discussed in Section 7.1 with a heavy roller to detect possible weak areas. Any weak soils identified as part of the proof-rolling process should be removed and replaced with well-compacted soil as outlined in Section 7.4 of this report. Synthetic turf (if used) and drainage system can then be placed per the manufacturer's recommendations.

### **6.6 Parking and Drive Areas**

Sandy silt (ML), sandy silty clay (CL-ML), silty sand (SM), clayey sand (SC), and sandy lean clay (CL) soils encountered near the existing ground surface in the borings, or similar materials used as engineered fill for grading the site, will likely constitute the pavement subgrade for most parking and drive areas. To permit correlation between information from test borings and actual subgrade conditions exposed during construction, a qualified Geotechnical Engineer should be retained to provide subgrade monitoring and testing during construction. If there is any change in project criteria, the recommendations contained in this report should be reviewed by our office.

Calculations used to determine the required pavement thickness are based only on the physical and engineering properties of the materials used and conventional thickness determination procedures. Pavement joining building should be constructed with a curb and the joint between the building and curb should be sealed. Related civil design factors such as subgrade drainage, shoulder support, cross-sectional configurations, surface elevations, reinforcing steel, joint design and environmental factors will significantly affect the service life and must be included in preparation of the construction drawings and specifications, but all were not included in the scope of this study. Normal periodic maintenance will be required for all pavements to achieve the design life of the pavement system.

*Please note*, the recommended pavement sections provided below are considered the minimum necessary to provide satisfactory performance based on the expected traffic loading. In some



cases, local municipal minimum standards for pavement section construction may exceed those provided below.

*Mechanical treatment of the pavement subgrade soil will not prevent normal seasonal movement of the underlying untreated materials. Pavement and other flatwork will have the same potential for movement as slabs constructed directly on the existing undisturbed soils (up to about 2½ inches). Good perimeter surface drainage with a minimum slope of 2 percent away from the pavement is recommended. The use of sand as a leveling course below pavement supported on expansive clays should be avoided. Normal maintenance of pavement should be expected over the life of the structures.*

*Our recommendations for subgrade stabilization are preliminary. The actual depth and type of stabilization should be determined in the field at the time of construction just after site stripping and proofrolling. Furthermore, the type and amount of the stabilizer may vary depending on the final grade elevation and the soil type encountered.*

We recommend stabilization procedures (if utilized) extend at least 1 ft beyond the edge of the pavement to reduce effects of seasonal shrinking and swelling upon the extreme edges of pavement.

When small or inaccessible areas are encountered where it is impracticable for standard mixing equipment to work, the above recommendations for chemical treatment may be substituted with an equivalent thickness of cement-treated sand or TxDOT flexible base (see Section 7.4).

### **6.6.1 Pavement Subgrade Preparation with Lime-Fly Ash or Cement**

Where low plasticity to non-plastic granular materials (silty sand and sandy silt) and cohesive soils with a plasticity index of 15 or less are encountered at the pavement subgrade level, the exposed surface of the pavement subgrade soils should be scarified to a depth of at least 6 inches. Then, the scarified soils in these areas should be chemically treated (lime-fly ash or cement modification) as described below and compacted to at least 95 percent of standard Proctor maximum dry density (ASTM D 698) and within the range of 2 percent below to 2 percentage points above the material's optimum moisture content.

Lime-fly ash or cement modification of the granular subgrade soils is recommended to aid in compaction of the subgrade soils and reduce future maintenance of pavement. The purpose of the lime-fly ash or cement modification is not necessarily to increase the subgrade strength, but to reduce the tendency of the granular soils to "pump" up or migrate through cracks and joints in the pavement over time when the subgrade becomes wet. The use of lime-fly ash or cement will also aid in compaction of the loose granular soils.

If lime-fly ash modification is used, the exposed surface of the pavement subgrade soils should be scarified to a depth of 6 inches and mixed with at least 3 percent hydrated lime and 7 percent fly ash (by dry unit weight) in conformance with TxDOT Standard Specifications Item 265. Specification for Type B slurry, if selected, should be submitted to the Geotechnical Engineer-of-Record prior to construction for approval. The curing period of the soil-lime mixture before the fly ash stabilization begins should be as directed by the Geotechnical Engineer-of-Record.





Prior to construction, we recommend that the optimum lime content of the subgrade soils be determined by laboratory testing. The selected Fly-Ash should be in accordance with ASTM C 618, Class C; and have a minimum CaO content of 20 percent. Lime-Fly Ash treated subgrade soils should be compacted to a minimum of 95 percent of the maximum density at a moisture content within the range of optimum moisture content to 3 percentage points above the optimum moisture content as determined by ASTM D 698.

If cement modification is used, the exposed surface of the pavement subgrade soils should be scarified to a depth of 6 inches and mixed with at least 4 percent Portland cement (by dry unit weight) in conformance with TxDOT Standard Specifications Item 275. Assuming an in-place unit weight of 110 pcf for the pavement subgrade soils, this percentage of cement equates to about 20 lbs of cement per square yard for 6 inches of treated depth. The soil-cement mixture should be compacted to at least 95 percent of standard Proctor maximum dry density (ASTM D 698) and within the range of -1 to +3 percentage points of the mixture's optimum moisture content.

#### **6.6.2 Pavement Subgrade Preparation with Lime**

Where sandy clay (CL) with PI greater than 15 is encountered at the pavement subgrade level, the exposed surface of the pavement subgrade soil should be scarified to a depth of 6 inches and mixed with a sufficient quantity of hydrated lime to reduce the soil-lime mixture plasticity index to 15 or less in conformance with TxDOT Standard Specifications Item 260. The optimum lime content is the amount of lime necessary to achieve a pH of 12.4 (which represents lime fixation).

The actual amount of lime required should be confirmed by additional laboratory tests (ASTM C 977 Appendix XI) prior to construction. However, for estimating purposes, we recommend that 6 percent lime by weight be assumed for treatment, resulting in an application rate of 30 lbs of lime per square yard of treated area (based on an assumed dry unit weight of 110 pcf). For construction purposes, we recommend that the optimum lime content of the subgrade soils be determined by laboratory testing. Lime-treated subgrade soils should be compacted to a minimum 95 percent of the maximum density at a moisture content within the range of optimum moisture content to 3 percentage points above the optimum moisture content as determined by TxDOT Test Method Tex-114-E.

#### **6.6.3 PCC Pavement Section**

Following subgrade improvement as recommended in Sections 6.6.1 and/or 6.6.2, PCC (reinforced) pavement sections are recommended in Table C.



<b>TABLE C</b> <b>RECCOMENDED PCC PAVEMENT SECTIONS</b>		
<b>Paving Areas and/or Type</b>	<b>Subgrade Thickness, Inches</b>	<b>PCC Thickness, Inches</b>
Parking Areas Subjected Exclusively to Passenger Vehicle Traffic Up to 75,000 ESALs	Lime/Fly Ash, Cement, or Lime Stabilized, 6	5
Drive Lanes, Fire Lanes, Areas Subject to Light Volume Truck Traffic Up to 700,000 ESALs	Lime/Fly Ash, Cement, or Lime Stabilized, 6	6
Bus Lanes, Dumpster Traffic Areas, Areas Subject to Moderate Volume Truck Traffic Up to 1,400,000 ESALs	Lime/Fly Ash, Cement, or Lime Stabilized, 6	7

If higher ESAL (18-kip Equivalent Single Axle Loads) counts are expected, ALPHA should be contacted for additional recommendations.

PCC should have a minimum compressive strength of 3,000 psi at 28 days in parking areas. Portland cement concrete should have a minimum compressive strength of 3,000 lbs per sq inch (psi) at 28 days in parking areas subjected exclusively to passenger vehicle traffic, drive lanes, and fire lanes (5-inch and 6-inch PCC sections). We recommend a minimum compressive strength of 3,500 lbs per sq inch (psi) at 28 days for bus lanes, dumpster traffic areas and truck areas (7-inch PCC section). Concrete should be designed with 5±1 percent entrained air. Joints in concrete paving should not exceed 15 ft. Reinforcing steel should consist of No. 3 bars placed at 18 inches on-center in two directions for the 5-inch and 6-inch PCC sections. Reinforcing steel should consist of No. 4 bars placed at 18 inches on-center in two directions for the 7-inch PCC section.

## **6.7 Flatwork**

Flatwork and any other soil-supported structural elements will be subjected to the same level of movement as discussed in Section 6.1 (up to about 2½ inches). If this level of movement is unacceptable, the subgrade improvement procedures as discussed in Section 6.1 could be considered for reduction in soil movement in areas where post-construction movements would be critical.

## **6.8 IBC Seismic Coefficients**

The Site Class for seismic design is based on several factors that include soil profile (soil or rock), shear wave velocity, and strength, averaged over a depth of 100 ft. Since our borings did not extend to 100-foot depths, we based our determinations on the assumption that the subsurface materials below the bottom of the borings were similar to those encountered at the termination depth of the borings. Based on Section 1613.3.2 of the 2012 International Building Code and Table 20.3-1 in the 2010 ASCE-7, we recommend using Site Class D (stiff soil) for seismic design at this site.





Based on Tables 1613.5.6(1) and 1613.5.6(2), and calculations performed using a Java program titled, “Seismic Hazard Curves and Uniform Hazard Response Spectra” published by the United States Geological Survey (USGS), the Seismic Design Category for the short period response accelerations and the 1 second response accelerations for the project site is **A** for all occupancy categories.

## 6.9 Corrosion

Four (4) representative samples obtained from the borings were tested for soluble sulfate concentrations, pH and electrical resistivity. Results of these laboratory tests are presented in Table D.

<b>TABLE D</b>					
<b>Corrosion Test Results</b>					
<b>Sample</b>		<b>Type of Material</b>	<b>Resistivity ohm-cm</b>	<b>pH</b>	<b>Sulfates ppm</b>
<b>Boring No.</b>	<b>Depth, ft</b>				
B-6	2-4	Reddish brown, brown SANDY LEAN CLAY	7,990	7.6	43.1
B-17	8-10	Reddish brown, gray SANDY FAT CLAY	3,540	8.5	8.03
B-21	4-6	Light gray, reddish brown FAT CLAY	4,260	8.9	75.5
B-60	0-2	Light brown SANDY SILTY CLAY	5,490	7.5	28.2

Based on results of these tests, the corrosion potential of metal utility lines is anticipated to be mild to moderate and metal utility lines will require corrosion protection. Based on the soluble sulfate test results, the risk of sulfate attack on Portland cement concrete structures is considered to be very low.

## 6.10 Drainage and Other Considerations

Adequate drainage should be provided to reduce seasonal variations in the moisture content of foundation soils. All pavement and sidewalks within 10 ft of the structure should be sloped away from the building to prevent ponding of water around the foundations. Final grades within 10 ft of the structure should be adjusted to slope away from the structure at a minimum slope of 2 percent. Maintaining positive surface drainage throughout the life of the structure is essential.

In areas with pavement or sidewalks adjacent to the new structure, a positive seal must be maintained between the structure and the pavement or sidewalk to minimize seepage of water into the underlying supporting soils. Post-construction movement of pavement and flatwork is common. Normal maintenance should include examination of all joints in paving and sidewalks, etc. as well as re-sealing where necessary.

Several factors relate to civil and architectural design and/or maintenance, which can significantly affect future movements of the foundation and floor slab system:



- Preferably, a complete system of gutters and downspouts should carry runoff water a minimum of 5 ft from the completed structure.
- Large trees and shrubs should not be allowed closer to the foundations than a horizontal distance equal to roughly one-half of their mature height due to their significant moisture demand upon maturing.
- Moisture conditions should be maintained "constant" around the edge of the slabs. Ponding of water in planters, in unpaved areas, and around joints in paving and sidewalks can cause slab movements beyond those predicted in this report.
- Planter box structures placed adjacent to the building should be provided with a means to assure concentrations of water are not available to the subsoil stratigraphy.

Trench backfill for utilities should be properly placed and compacted as outlined in Sections 7.4 and 7.5 of this report and in accordance with requirements of local City standards. Since granular bedding backfill is used for most utility lines, the backfilled trench should not become a conduit and allow access for surface or subsurface water to travel toward the new structures. Concrete cut-off collars or clay plugs should be provided where utility lines cross building lines to prevent water from traveling in the trench backfill and entering beneath the structures.

## **7.0 GENERAL CONSTRUCTION PROCEDURES AND GUIDELINES**

Variations in subsurface conditions could be encountered during construction. To permit correlation between test boring data and actual subsurface conditions encountered during construction, it is recommended a registered Professional Engineering firm be retained to observe construction procedures and materials.

Some construction problems, particularly degree or magnitude, cannot be anticipated until the course of construction. The recommendations offered in the following paragraphs are intended not to limit or preclude other conceivable solutions, but rather to provide our observations based on our experience and understanding of the project characteristics and subsurface conditions encountered in the borings.

### **7.1 Site Preparation and Grading**

All areas supporting foundations, flatwork, or areas to receive new fill should be properly prepared.

- After completion of the necessary stripping, clearing, and excavating and prior to placing any required fill, the exposed soil subgrade should be carefully evaluated by probing and testing. Any undesirable material (organic material, wet, soft, or loose soil) still in place should be removed.
- The exposed soil subgrade should be further evaluated by proof-rolling with a heavy pneumatic tired roller, loaded dump truck or similar equipment weighing approximately 20 tons to check for pockets of soft or loose material hidden beneath a thin crust of possibly better soil.



- Proof-rolling procedures should be observed routinely by a Professional Engineer, or his designated representative. Any undesirable material (organic material, wet, soft, or loose soil) exposed during the proofroll should be removed and replaced with well-compacted material as outlined in Section 7.4.
- Prior to placement of any fill, the exposed soil subgrade should then be scarified to a minimum depth of 6 inches and recompact as outlined in Section 7.4.

If fill is to be placed on existing slopes (natural or constructed) steeper than six horizontal to one vertical (6:1), the fill materials should be benched into the existing slopes in such a manner as to provide a minimum bench-key width of five (5) ft. This should provide a good contact between the existing soils and new fill materials, reduce potential sliding planes, and allow relatively horizontal lift placements.

Slope stability analysis of embankments (natural or constructed) was not within the scope of this study.

The contractor is responsible for designing any excavation slopes, temporary sheeting or shoring. Design of these structures should include any imposed surface surcharges. Construction site safety is the sole responsibility of the contractor, who shall also be solely responsible for the means, methods and sequencing of construction operations. The contractor should also be aware that slope height, slope inclination or excavation depths (including utility trench excavations) should in no case exceed those specified in local, state and/or federal safety regulations, such as OSHA Health and Safety Standard for Excavations, 29 CFR Part 1926, or successor regulations. Stockpiles should be placed well away from the edge of the excavation and their heights should be controlled so they do not surcharge the sides of the excavation. Surface drainage should be carefully controlled to prevent flow of water over the slopes and/or into the excavations. Construction slopes should be closely observed for signs of mass movement, including tension cracks near the crest or bulging at the toe. If potential stability problems are observed, a geotechnical engineer should be contacted immediately. Shoring, bracing or underpinning required for the project (if any) should be designed by a professional engineer registered in the State of Texas.

Due to the nature of the sandy and clayey soils found near the surface at the borings, traffic of heavy equipment (including heavy compaction equipment) may create pumping and general deterioration of shallow soils. Therefore, some construction difficulties should be anticipated during periods when these soils are saturated.

## **7.2 Constructability**

Based on the borings performed for this study, non-plastic sandy silt and silty sand, and low plasticity sandy silty clay and clayey sand was observed near the ground surface at most of the boring locations. As such, construction difficulties should be anticipated, especially during the wet season or immediately after rain events.

Although having a thin layer of non-plastic or low plasticity soils overlying cohesive soils is typical of this geologic region, our experience suggests that the local contractors find these materials troublesome and can often be the source of change orders, construction delays, and budget over



runs. The following recommendations are intended to address the site access and workability problems that will occur due to the presence of surficial non-plastic or low plasticity soils and are provided in descending order of preference:

1. The most appropriate method of dealing with surficial non-plastic or low plasticity soils is to remove them and replace them with suitable cohesive fill soils. After successfully passing a proofroll as discussed above in Section 7.1, suitable cohesive fill soils should be placed and compacted as discussed below in Section 7.4.
2. Lime-fly ash or cement modification of the non-plastic or low plasticity soils could be utilized to aid in compaction and to provide a working surface. Recommendations for application rates and placement procedures for lime-fly ash or cement modification are provided above in Section 6.7.1.
3. Based on our experience, the most difficult method of dealing with the surficial non-plastic or low plasticity soils would be to rework the soils using conventional moisture control and compaction methods. However, even properly placed and compacted sandy soils will not have enough shear strength (bearing capacity) to hold up to construction traffic or weathering when exposed at the ground surface. As such, the surficial non-plastic or low plasticity soils would require continual repair and maintenance until the planned footings and/or pavements could be constructed.

### **7.3 Foundation Excavations**

All foundation excavations should be monitored to verify foundations bear on suitable material. The bearing stratum exposed in the base of all foundation excavations should be protected against any detrimental change in conditions. Unsuitable materials encountered at the bearing level of shallow foundations should be removed and replaced with structural concrete, lean concrete flowable fill, flexible base, or compacted non-expansive material. The requirements for flexible base and non-expansive material are described in Section 7.4 below.

All concrete for foundations should be placed as soon as practical after the excavation is made. Drilled piers should be excavated and concrete placed within 8 hours after the design penetration into the bearing stratum is begun. *Due to the presence of groundwater and sandy soils at this site, it may be necessary to place concrete immediately after constructing the underream portion of the pier to reduce the likelihood of underream collapse.*

Surface runoff should be drained away from excavations and not allowed to pond in the bottom of the excavation. The exposed foundation soils should not be allowed to become excessively dry or wet before placement of concrete. Prolonged exposure of the bearing surface to air or water will result in changes in strength and compressibility of the bearing stratum. Therefore, if delays occur, underream pier excavations, spread footings, and grade beams should be slightly widened, deepened and cleaned in order to provide a fresh bearing surface. *Also, granular soils as encountered at the borings are prone to collapse; it may be necessary to form shallow foundations and grade beams for slab foundations.*

All pier shafts should have a minimum diameter of 1.5 ft to facilitate clean-out of the base and proper monitoring. Concrete placed in pier holes should be directed through a tremie, hopper, or equivalent. Placement of concrete should be vertical through the center of the shaft without hitting



the sides of the pier or reinforcement to reduce the possibility of segregation of aggregates. Concrete placed in piers should have a minimum slump of 5 inches (but not greater than 7 inches) to avoid potential honey-combing.

Observations during pier drilling should include, but not necessarily be limited to, the following items:

- Verification of proper bearing strata and consistency of subsurface stratification with regard to boring logs;
- Verification of the minimum required penetration into the bearing strata is achieved;
- Complete removal of cuttings from bottom of pier holes;
- Proper handling of any observed water seepage and sloughing of subsurface materials;
- No standing water should be permitted at the bottom of pier holes prior to placing concrete;
- Verification that the bell for drilled-and-underreamed piers are concentric with the pier shafts, and;
- Verification of pier diameter, underream diameter, and steel reinforcement.

Reinforcing steel should be checked for size and placement prior to concrete placement. Placement of concrete should be accomplished as soon as possible after excavation to reduce changes in the moisture content or the state of stress of the foundation materials. No foundation element should be left open overnight without concreting.

Free water was encountered in Borings B-1, B-2, B-3, and B-5 through B-11, B-15, B-17, B-19, B-21, and B-68 through B-85 at depths of 18 to 43 ft below the existing ground surface. However, groundwater seepage may be encountered at shallower depths during pier installation, particularly during or after periods of precipitation. Submersible pumps, bailing tools, and/or immediate placement of concrete may be sufficient to control light seepage. Temporary casing may also be necessary to prevent sloughing of soils during pier drilling operations and to control water seepage as encountered. We recommend a separate bid item be provided for casing on the contractors' bid schedule.

*Due to the presence of the granular soils and sandy clay with high sand content and sand seams, the underreams may be prone to collapse. Immediate placement of concrete after constructing the underream may be sufficient to control underream collapse. Test piers (with underream) are recommended to verify pier constructability. If test piers indicate underreamed piers will not be practical, consideration could be given to drilling a straight-shaft pier the same diameter as the underream, or redesigning the foundations to consist of shallow spread footings. We should be contacted for further review and evaluation if groundwater seepage and/or underream collapse occurs during pier installation.*



## 7.4 Fill Compaction

**Select Fill (Non-Expansive Fill):** Select fill used as non-expansive fill should have a liquid limit less than 40, a plasticity index (PI) not less than 10 nor greater than 20. Select fill should not contain deleterious material and debris. Select fill should be compacted to a dry density of at least 95 percent of standard Proctor maximum dry density (ASTM D 698) and within the range of -1 to +3 percentage points of the material's optimum moisture content. The plasticity index and liquid limit of material used as select, non-expansive fill should be verified during fill placement using laboratory tests. Atterberg limits tests to verify the select, non-expansive fill shall be performed at a frequency of at least one test per 2 ft of thickness per 5,000 square ft. Atterberg limits shall be staggered between various lifts within each 5,000 square ft.

**Flexible Base Material (Non-Expansive Fill):** Flexible base material used as non-expansive fill and for backfilling foundation undercuts and pavement subgrade undercuts should meet the requirements of TxDOT Standard Specifications Item 247, Type A or D, Grade 1-2. The material should be compacted to a minimum 95 percent of standard Proctor maximum dry density (ASTM D 698) and within -2 to +3 percentage points of the material's optimum moisture content.

The following recommendations pertain to fill soils placed for general site grading.

Clay and sandy clay soils to be used as general site fill outside of the building pad area and below the 3 ft of select fill depth within the building pad area should be compacted to a dry density of at least 95 percent of standard Proctor maximum dry density (ASTM D 698) and within the range of 1 percentage point below to 3 percentage points above the material's optimum moisture content. Clayey soil materials used as fill should be processed and the largest particle or clod should be less than 6 inches prior to compaction.

Granular soils (silty sand, sandy silt, clayey sand and poorly graded sand) to be used as general site fill outside of the building pad should be compacted to a dry density of at least 95 percent of standard Proctor maximum dry density (ASTM D 698) and within the range of 2 percentage point below to 2 percentage points above the material's optimum moisture content. It may be necessary to mix about 3 to 5 percent cement into the granular soils to improve the compaction characteristics of these materials.

Compaction should be accomplished by placing fill in about 8-inch thick loose lifts and compacting each lift to at least the specified minimum dry density. Field density and moisture content tests should be performed on each lift.

## 7.5 Utilities and Deep Fills

In cases where utility lines and/or deep fills are more than 10 ft deep, the fill/backfill below 10 ft should be compacted to at least 100 percent of standard Proctor maximum dry density (ASTM D 698) and within -2 to +2 percentage points of the material's optimum moisture content. The portion of the fill/backfill shallower than 10 ft should be compacted as previously outlined. Density tests should be performed on each lift (maximum 12-inch thick) and should be performed as the trench is being backfilled.

*Even if fill is properly compacted, fills in excess of about 10 ft are still subject to settlements over time of up to about 1 to 2 percent of the total fill thickness. This should be considered when*





*designing pavements, flatwork, and other structures over utility lines and/or other areas with deep fill.*

If utility trenches or other excavations extend to or beyond a depth of 5 ft below construction grade, the contractor or others shall be required to develop an excavation safety plan to protect personnel entering the excavation or excavation vicinity. The collection of specific geotechnical data and the development of such a plan, which could include designs for sloping and benching or various types of temporary shoring, is beyond the scope of this study. Any such designs and safety plans shall be developed in accordance with current OSHA guidelines and other applicable industry standards.

## **7.6 Wet Weather Conditions**

Due to the nature of the surficial soils, construction operations may encounter difficulties due to wet or soft surface soils becoming a general hindrance to equipment, especially following periods of wet weather. If the subgrade cannot be adequately compacted to the minimum densities as described previously, one of the following measures will be required: 1) removal and replacement with select fill, 2) chemical treatment of the soil to dry and improve the condition of the subgrade, or 3) drying by natural means if the schedule allows. Based on our experience with similar soils in this area, chemical treatment is generally the most efficient and effective method to increase the supporting value of wet and weak subgrade. ALPHA TESTING should be contacted for additional recommendations if chemical treatment is needed due to soft and wet subgrade.

## **7.7 Groundwater**

Free water was encountered in Borings B-1, B-2, B-3, B-5 through B-11, B-15, B-17, B-19, B-21 and B-68 through B-85 at depths of 18 to 43 ft below the existing ground surface during drilling and immediately after the completion of drilling operations. Perched water was encountered at depths of about 2 to 10 ft in Borings B-7, B-58, B-69, B-74, B-78, B-83, and B-84. Free water was not encountered in the remaining borings. From our experience with similar soils, groundwater seepage could be encountered at relatively shallow depths in excavations for foundations, utility conduits, and other general excavations. The risk of seepage increases with depth of excavation and during or after periods of precipitation. Standard sump pits and pumping may be adequate to control seepage on a local basis for relatively shallow excavations. Supplemental dewatering measures, such as (but not limited to) submersible pumps in slotted casings and wellpoints may be required where sump pits and pumping are not adequate or where groundwater is encountered in granular soils.

## **8.0 LIMITATIONS**

Professional services provided in this geotechnical exploration were performed, findings obtained, and recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. The scope of services provided herein does not include an environmental assessment of the site or investigation for the presence or absence of hazardous materials in the soil, surface water or groundwater. ALPHA, upon written request, can be retained to provide these services.

ALPHA is not responsible for conclusions, opinions or recommendations made by others based on this data. Information contained in this report is intended for the exclusive use of the Client



(and their designated design representatives), and is related solely to design of the specific structures outlined in Section 2.0. No party other than the Client (and their designated design representatives) shall use or rely upon this report in any manner whatsoever unless such party shall have obtained ALPHA's written acceptance of such intended use. Any such third party using this report after obtaining ALPHA's written acceptance shall be bound by the limitations contained herein. Recommendations presented in this report should not be used for design of any other structures except those specifically described in this report. In all areas of this report in which ALPHA may provide additional services if requested to do so in writing, it is presumed that such requests have not been made if not evidenced by a written document accepted by ALPHA. Further, subsurface conditions can change with passage of time. Recommendations contained herein are not considered applicable for an extended period of time after the completion date of this report. It is recommended our office be contacted for a review of the contents of this report for construction commencing more than one (1) year after completion of this report. Non-compliance with any of these recommendations by the Client or anyone else shall release ALPHA from any liability resulting from the use of, or reliance upon, this report.

Recommendations provided in this report are based on our understanding of information provided by the Client about characteristics of the project. If the Client notes any deviation from the facts about project characteristics, our office should be contacted immediately since this may materially alter the recommendations. Further, ALPHA is not responsible for damages resulting from workmanship of designers or contractors. It is recommended the Owner retain qualified personnel, such as a Geotechnical Engineering firm, to verify construction is performed in accordance with plans and specifications.





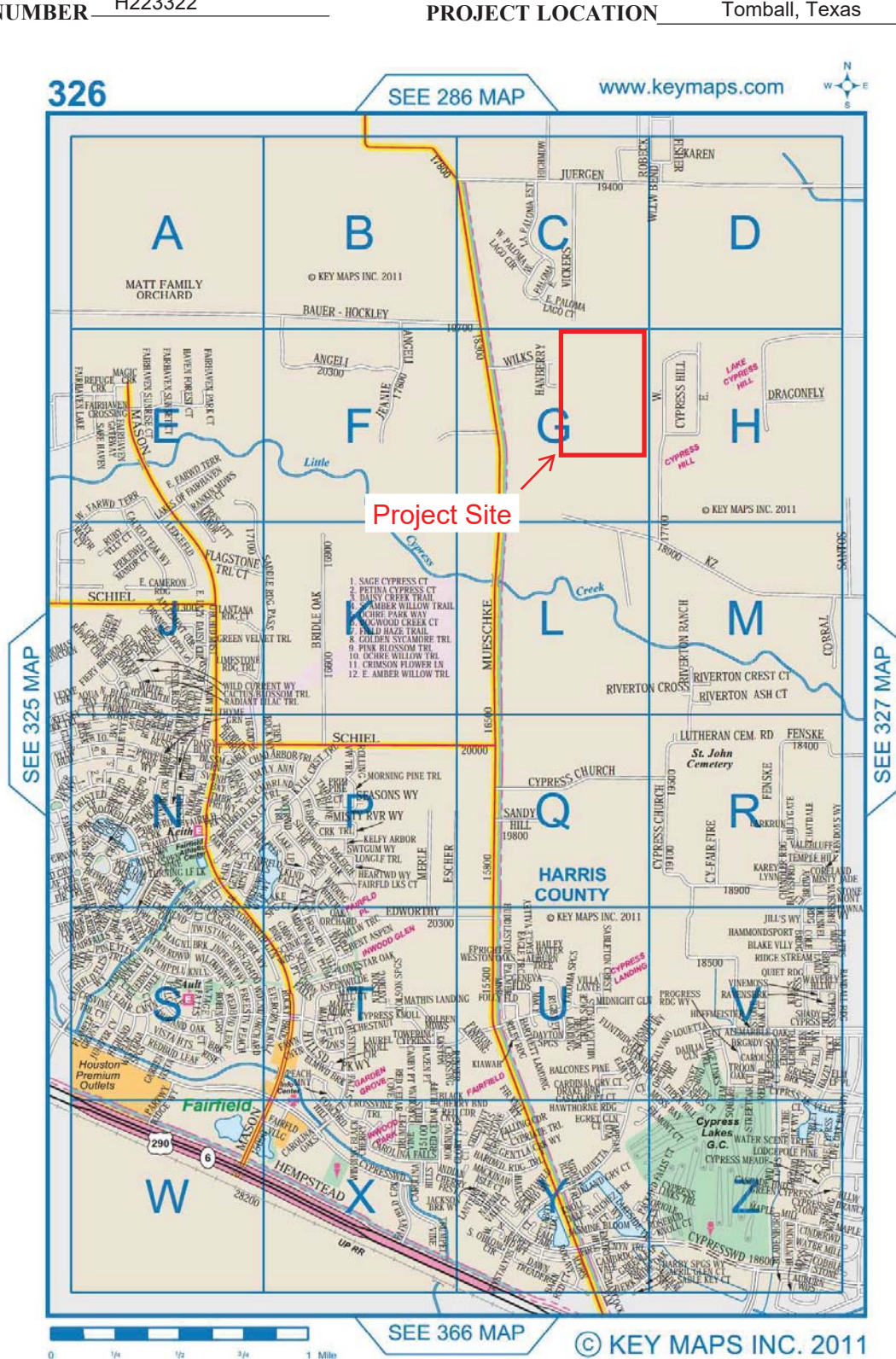
# APPENDIX

CLIENT Tomball ISD

PROJECT NAME TISD Juergen Rd High School

PROJECT NUMBER H223322

PROJECT LOCATION Tomball, Texas



Key Map used with permission

FIGURE A-1

CLIENT Tomball ISD  
PROJECT NUMBER H223322

PROJECT NAME TISD Juergen Rd High School  
PROJECT LOCATION Tomball, Texas

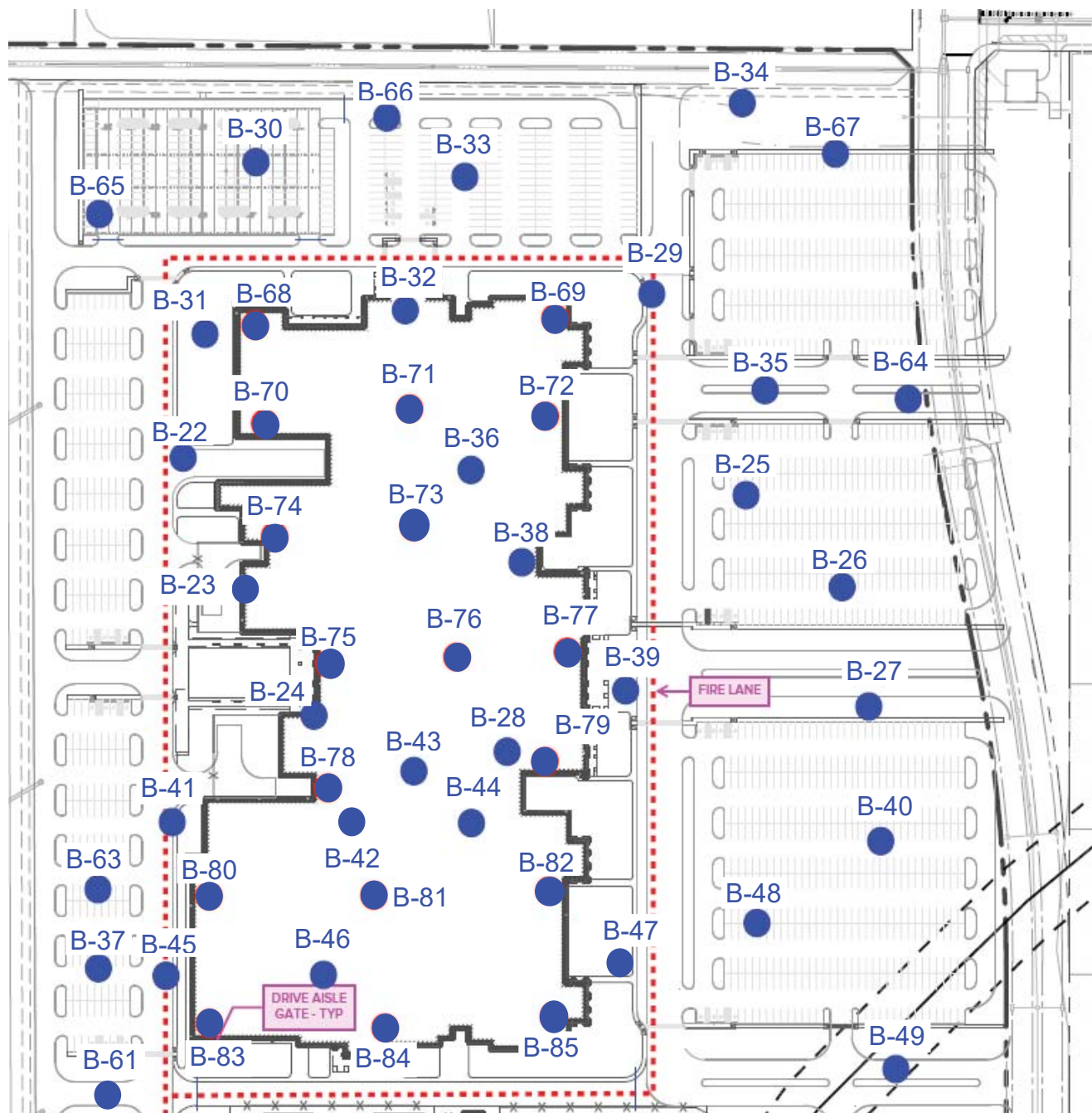


FIGURE A-2



CLIENT Tomball ISD  
PROJECT NUMBER H223322

PROJECT NAME TISD Juergen Rd High School  
PROJECT LOCATION Tomball, Texas

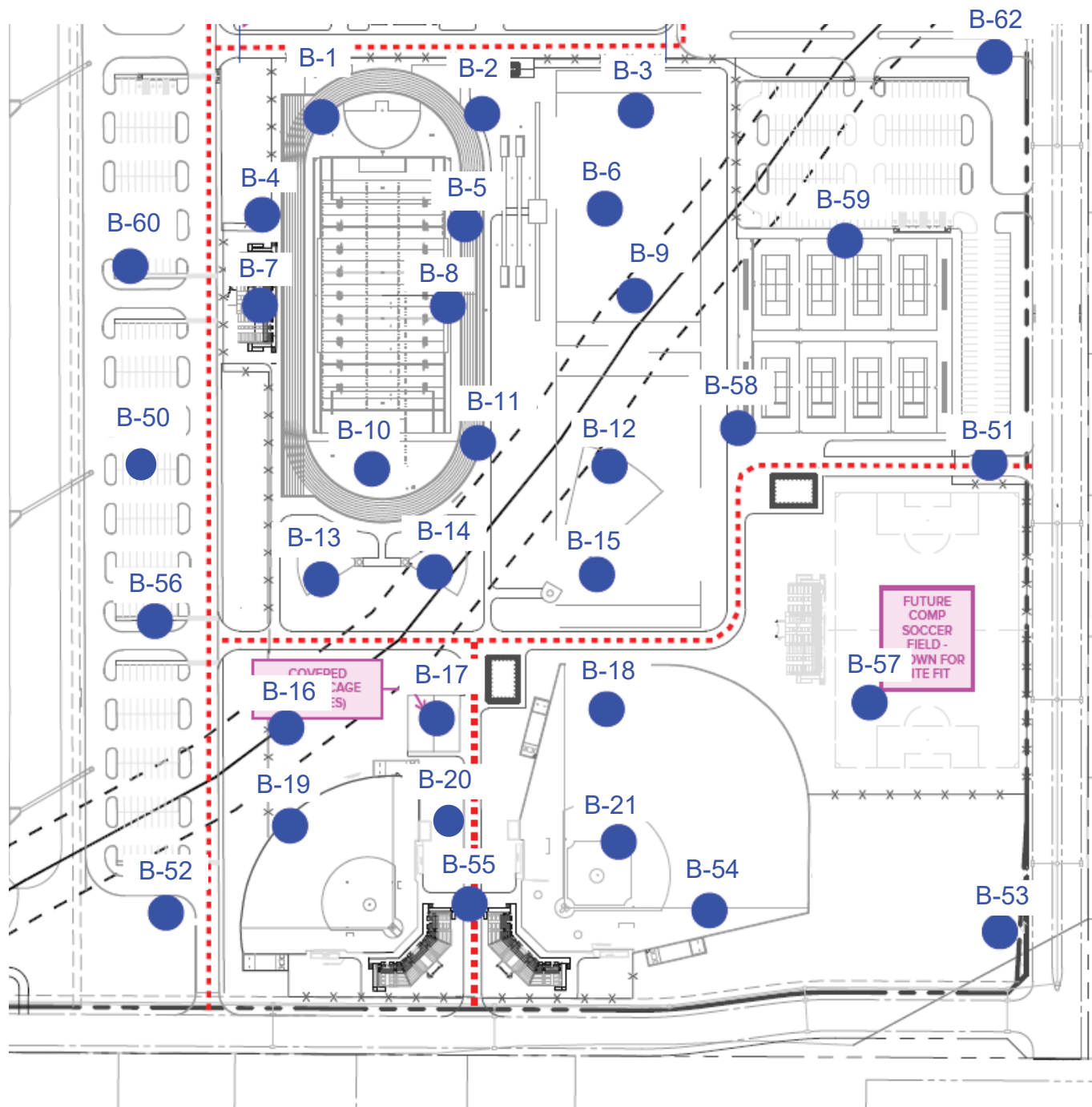


FIGURE A-2



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### **A-3    METHODS OF FIELD EXPLORATION**

Using standard rotary drilling equipment, a total of 85 test borings were performed for this geotechnical exploration at the approximate locations shown on the Boring Location Plan, Figure A-2. The boring locations were staked by using a handheld GPS device as shown on the site plan provided during this study. The locations of the test borings shown on the Boring Location Plan are considered accurate only to the degree implied by the method used to define them.

Relatively undisturbed samples of the cohesive subsurface materials were obtained by hydraulically pressing 3-inch O.D. thin-wall sampling tubes into the underlying soils at selected depths (ASTM D 1587). These samples were removed from the sampling tubes in the field and examined visually. One representative portion of each sample was sealed in a plastic bag for use in future visual examinations and possible testing in the laboratory.

In addition, representative samples of the subsurface materials were obtained employing split-spoon sampling procedures in general accordance with ASTM Standard D 1586. Disturbed samples were obtained at selected depths in the borings by driving a standard 2-inch outside diameter split-spoon sampler 18 inches into the subsurface material using a 140-pound hammer falling 30 inches. The number of blows required to drive the split-spoon sampler the final 12 inches of penetration (N-value) is recorded in the appropriate column on the boring logs presented in Appendix A of this report.

Logs of all borings are included in the Appendix of this report. The logs show visual descriptions of subsurface strata encountered using the Unified Soil Classification System. Sampling information, pertinent field data, and field observations are also included. Samples not consumed by testing will be retained in our laboratory for at least 14 days and then discarded unless the Client requests otherwise.

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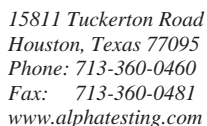


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#### **A-4    METHODS OF LABORATORY TESTING**

Selected samples were examined and classified by a qualified member of the Geotechnical Division and the boring logs were edited as necessary. To aid in classifying the subsurface materials and to determine the general engineering characteristics, natural moisture content tests (ASTM D 2216), Atterberg-limit tests (ASTM D 4318-Method B), and gradation tests (percent of material passing a No. 200 sieve, ASTM D 1140) and dry unit weight tests (ASTM D 2166) were performed on select samples. A calibrated pocket penetrometer was used to approximate the unconfined compressive strength as an indicator of soil consistency for all intact cohesive samples. Unconfined compression strength tests (ASTM D 2166) were also performed on representative samples. Results of all laboratory tests described above are provided on the accompanying Log of Boring sheets.

In addition to the Atterberg-limit tests, the expansive properties of the clay soils were further analyzed by absorption swell tests (ASTM D 4546). The swell test is performed by placing a selected sample in a consolidation machine and applying either the approximate current or expected overburden pressure and then allowing the sample to absorb water. When the sample exhibits very little tendency for further expansion, the height increase is recorded, and the percent free swell and total moisture gain calculated. Results of the absorption swell tests are provided on the Log of Boring sheets included in this appendix.



**BORING NO.:** 1  
Sheet 1 of 1

**PROJECT NO.:** H223322

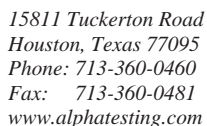
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<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	12/27/2022	<b>End Date:</b>	12/27/2022
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

**Location:** Tomball, Texas  
**Surface Elevation:** 174  
**West:**  
**North:**  
**Hammer Drop (lbs / in):** 140 / 30

[illegible]







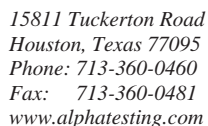
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Sheet 1 of 1

**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	12/28/2022	<b>End Date:</b>	12/28/2022
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

<b>Location:</b>	Tomball, Texas
<b>Surface Elevation:</b>	175
<b>West:</b>	
<b>North:</b>	
<b>Hammer Drop (lbs / in):</b>	140 / 30

[illegible]



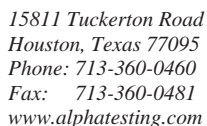
**BORING NO.:** 4  
Sheet 1 of 1

**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	12/7/2022	<b>End Date:</b>	12/7/2022
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

<b>Location:</b>	Tomball, Texas
<b>Surface Elevation:</b>	174
<b>West:</b>	
<b>North:</b>	
<b>Hammer Drop (lbs / in):</b>	140 / 30

[illegible]



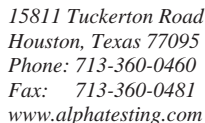
**BORING NO.:** 5  
Sheet 1 of 1

**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	12/7/2022	<b>End Date:</b>	12/7/2022
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

Location:	Tomball, Texas
Surface Elevation:	174
West:	
North:	
Hammer Drop (lbs / in):	140 / 30

[illegible]



**BORING NO.:** 6  
Sheet 1 of 1

**PROJECT NO.:** H223322

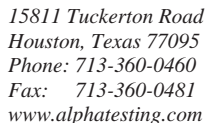
<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	12/7/2022	<b>End Date:</b>	12/7/2022
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

<b>Location:</b>	Tomball, Texas
<b>Surface Elevation:</b>	174
<b>West:</b>	
<b>North:</b>	
<b>Hammer Drop (lbs / in):</b>	140 / 30

[illegible]



[illegible]



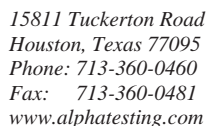
**BORING NO.:** 9  
Sheet 1 of 1

**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	12/7/2022	<b>End Date:</b>	12/7/2022
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

**Location:** Tomball, Texas  
**Surface Elevation:** 174  
**West:**  
**North:**  
**Hammer Drop (lbs / in):** 140 / 30

[illegible]



**BORING NO.:** 10  
Sheet 1 of 1

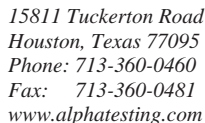
**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	12/13/2022	<b>End Date:</b>	12/13/2022
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

<b>Location:</b>	Tomball, Texas
<b>Surface Elevation:</b>	174
<b>West:</b>	
<b>North:</b>	
<b>Hammer Drop (lbs / in):</b>	140 / 30

[illegible]





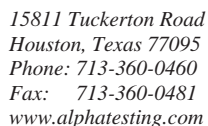
**BORING NO.:** 11  
Sheet 1 of 1

**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	12/7/2022	<b>End Date:</b>	12/7/2022
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

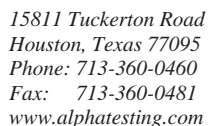
**Location:** Tomball, Texas  
**Surface Elevation:** 174  
**West:**  
**North:**  
**Hammer Drop (lbs / in):** 140 / 30

[illegible]



<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	12/8/2022	<b>End Date:</b>	12/8/2022
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

[illegible]



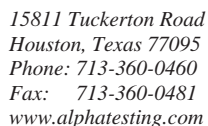
**BORING NO.:** 13  
Sheet 1 of 1

**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	12/8/2022	<b>End Date:</b>	12/8/2022
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

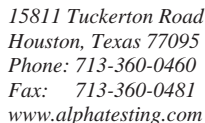
Location:	Tomball, Texas
Surface Elevation:	174
West:	
North:	
Hammer Drop (lbs / in):	140 / 30

[illegible]



<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	12/13/2022	<b>End Date:</b>	12/13/2022
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

[illegible]



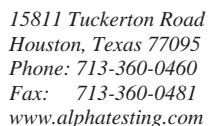
**BORING NO.:** 15  
Sheet 1 of 1

**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	12/8/2022	<b>End Date:</b>	12/8/2022
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

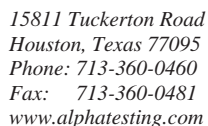
**Location:** Tomball, Texas  
**Surface Elevation:** 176  
**West:**  
**North:**  
**Hammer Drop (lbs / in):** 140 / 30

[illegible]



<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	12/9/2022	<b>End Date:</b>	12/9/2022
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

[illegible]



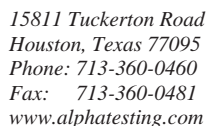
**BORING NO.:** 17  
Sheet 1 of 1

**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	12/6/2022	<b>End Date:</b>	12/6/2022
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

<b>Location:</b>	Tomball, Texas
<b>Surface Elevation:</b>	177
<b>West:</b>	
<b>North:</b>	
<b>Hammer Drop (lbs / in):</b>	140 / 30

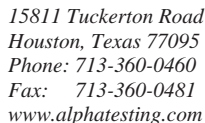
[illegible]



<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	12/9/2022	<b>End Date:</b>	12/9/2022
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

[illegible]



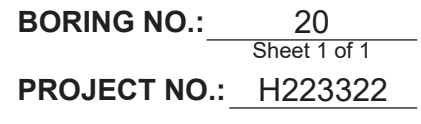


**BORING NO.:** 19  
Sheet 1 of 1  
**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	12/9/2022	<b>End Date:</b>	12/9/2022
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

**Location:** Tomball, Texas  
**Surface Elevation:** 174  
**West:**  
**North:**  
**Hammer Drop (lbs / in):** 140 / 30

[illegible]



**Location:** Tomball, Texas

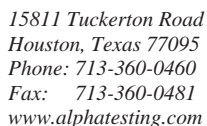
**Surface Elevation:** 177

**West:**

**North:**

**Hammer Drop (lbs / in):** 140 / 30

[illegible]



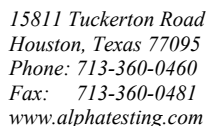
**BORING NO.:** 21  
Sheet 1 of 1  
**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	12/8/2022	<b>End Date:</b>	12/8/2022
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

Location:	Tomball, Texas
Surface Elevation:	178
West:	
North:	
Hammer Drop (lbs / in):	140 / 30

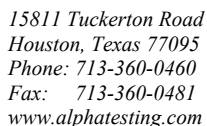
[illegible]

[illegible]



<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/13/2023	<b>End Date:</b>	2/13/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

[illegible]



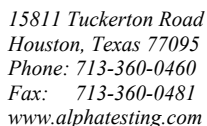
**BORING NO.:** 24  
Sheet 1 of 1

**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/13/2023	<b>End Date:</b>	2/13/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

**Location:** Tomball, Texas  
**Surface Elevation:** 176'  
**West:**  
**North:**  
**Hammer Drop (lbs / in):** 140 / 30

[illegible]



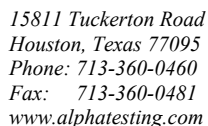
**BORING NO.:** 25  
Sheet 1 of 1

**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/13/2023	<b>End Date:</b>	2/13/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

**Location:** Tomball, Texas  
**Surface Elevation:** 176'  
**West:**  
**North:**  
**Hammer Drop (lbs / in):** 140 / 30

[illegible]

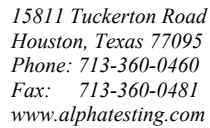


<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/13/2023	<b>End Date:</b>	2/13/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

[illegible]

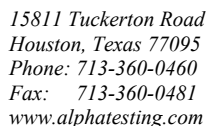


[illegible]



<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/13/2023	<b>End Date:</b>	2/13/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

[illegible]



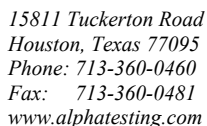
**BORING NO.:** 29  
Sheet 1 of 1  
**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/13/2023	<b>End Date:</b>	2/13/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

**Location:** Tomball, Texas  
**Surface Elevation:** 177'  
**West:**  
**North:**  
**Hammer Drop (lbs / in):** 140 / 30

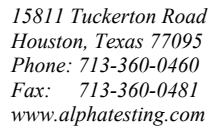
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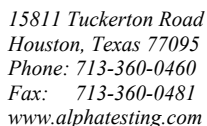
<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/13/2023	<b>End Date:</b>	2/13/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

[illegible]



<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/13/2023	<b>End Date:</b>	2/13/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

[illegible]



**BORING NO.:** 33  
Sheet 1 of 1

**PROJECT NO.:** H223322

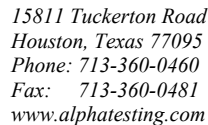
<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/13/2023	<b>End Date:</b>	2/13/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

**Location:** Tomball, Texas  
**Surface Elevation:** 178'  
**West:**  
**North:**  
**Hammer Drop (lbs / in):** 140 / 30

[illegible]

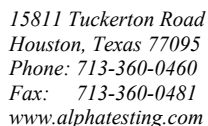






<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/13/2023	<b>End Date:</b>	2/13/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

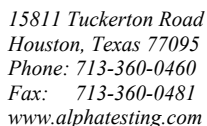
[illegible]



<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/13/2023	<b>End Date:</b>	2/13/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

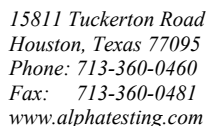
[illegible]





<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/13/2023	<b>End Date:</b>	2/13/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

[illegible]



**BORING NO.:** 39  
Sheet 1 of 1

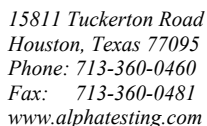
**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/13/2023	<b>End Date:</b>	2/13/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

**Location:** Tomball, Texas  
**Surface Elevation:** 176'  
**West:**  
**North:**  
**Hammer Drop (lbs / in):** 140 / 30

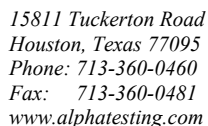
[illegible]

[illegible]



<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	1/3/2023	<b>End Date:</b>	1/3/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

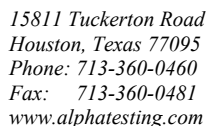
[illegible]



<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	1/3/2023	<b>End Date:</b>	1/3/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

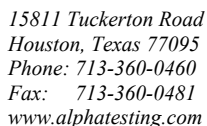
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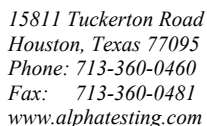
<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	1/3/2023	<b>End Date:</b>	1/3/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

[illegible]



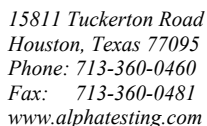
<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	1/3/2023	<b>End Date:</b>	1/3/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

[illegible]



<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	1/3/2023	<b>End Date:</b>	1/3/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

[illegible]



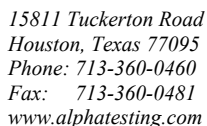
**BORING NO.:** 46  
Sheet 1 of 1

**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	1/3/2023	<b>End Date:</b>	1/3/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

**Location:** Tomball, Texas  
**Surface Elevation:** 175'  
**West:**  
**North:**  
**Hammer Drop (lbs / in):** 140 / 30

[illegible]

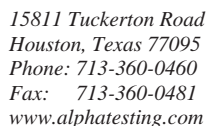


<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	1/3/2023	<b>End Date:</b>	1/3/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

[illegible]



[illegible]

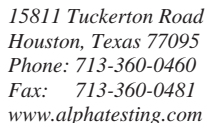


<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	1/3/2023	<b>End Date:</b>	1/3/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

[illegible]







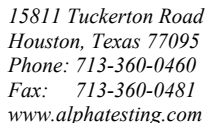
**BORING NO.:** 52  
Sheet 1 of 1

**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	1/3/2023	<b>End Date:</b>	1/3/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

<b>Location:</b>	Tomball, Texas
<b>Surface Elevation:</b>	174
<b>West:</b>	
<b>North:</b>	
<b>Hammer Drop (lbs / in):</b>	140 / 30

[illegible]



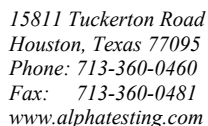
**BORING NO.:** 53  
Sheet 1 of 1

**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/10/2023	<b>End Date:</b>	2/10/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

**Location:** Tomball, Texas  
**Surface Elevation:** 178'  
**West:** \_\_\_\_\_  
**North:** \_\_\_\_\_  
**Hammer Drop (lbs / in):** 140 / 30

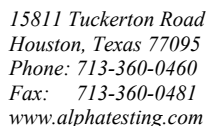
[illegible]



<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/10/2023	<b>End Date:</b>	2/10/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

**Location:** Tomball, Texas  
**Surface Elevation:** 179'  
**West:**  
**North:**  
**Hammer Drop (lbs / in):** 140 / 30

[illegible]



<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/10/2023	<b>End Date:</b>	2/10/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

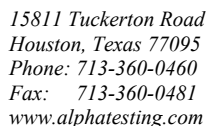
[illegible]

Depth, feet	Graphic Log	GROUND WATER OBSERVATIONS		Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft, in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Swell, %
		<div> <div>▽</div> <div>On Rods (ft):</div> <div>NONE</div> </div> <div> <div>▼</div> <div>After Drilling (ft):</div> <div>DRY</div> </div> <div> <div>▼</div> <div>After ____ Hours (ft):</div> <div></div> </div>	MATERIAL DESCRIPTION												
			Light brown SANDY SILT	1.0			1.5		51		19	NP	NP	NP	
			Light brown SANDY LEAN CLAY				1.5				15				
5			- with ferrous nodules from 3' to 5'	5.0			3.5				14				
			BORING TERMINATED AT 5 FT												
10															
15															
20															
25															
30															
35															
40															
45															
50															

[illegible]

[illegible]

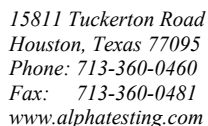




<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/10/2023	<b>End Date:</b>	2/10/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

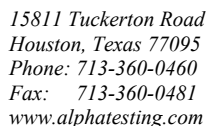
**Location:** Tomball, Texas  
**Surface Elevation:** 175'  
**West:**  
**North:**  
**Hammer Drop (lbs / in):** 140 / 30

[illegible]



<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	1/3/2023	<b>End Date:</b>	1/3/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

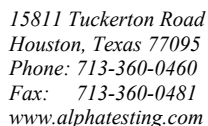
[illegible]



<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/10/2023	<b>End Date:</b>	2/10/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

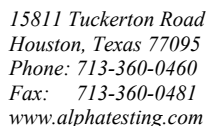
**Location:** Tomball, Texas  
**Surface Elevation:** 175'  
**West:**  
**North:**  
**Hammer Drop (lbs / in):** 140 / 30

[illegible]



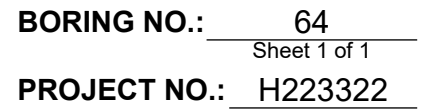
<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/10/2023	<b>End Date:</b>	2/10/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

[illegible]



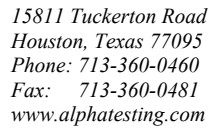
<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/10/2023	<b>End Date:</b>	2/10/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

[illegible]



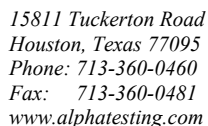
**Location:** Tomball, Texas  
**Surface Elevation:** 176'  
**West:** \_\_\_\_\_  
**North:** \_\_\_\_\_  
**Hammer Drop (lbs / in):** 140 / 30

[illegible]



<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/10/2023	<b>End Date:</b>	2/10/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

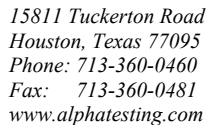
Depth, feet	Graphic Log	GROUND WATER OBSERVATIONS		Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft, in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Swell, %
		<div> <div>▽</div> <div>On Rods (ft):</div> <div>NONE</div> </div> <div> <div>▼</div> <div>After Drilling (ft):</div> <div>DRY</div> </div> <div> <div>▽</div> <div>After ____ Hours (ft):</div> <div></div> </div>	MATERIAL DESCRIPTION												
			Brown SANDY SILT with root fibers	1.0					54		19	NP	NP	NP	
			Brown SANDY SILTY CLAY			8					18				
5				5.0		6					18				
			BORING TERMINATED AT 5 FT												
10															
15															
20															
25															
30															
35															
40															
45															
50															



<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/10/2023	<b>End Date:</b>	2/10/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

Depth, feet	Graphic Log	<div> <div>GROUND WATER OBSERVATIONS</div> <div> <div>▽ On Rods (ft): _____ NONE</div> <div>▼ After Drilling (ft): _____ DRY</div> <div>▽ After _____ Hours (ft): _____</div> </div> </div>	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft, in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Swell, %
		Brown SANDY SILT	1.0	III						13				
		Brown SANDY SILTY CLAY		X	11					13	17	12	5	
5			5.0	X	15					13				
		BORING TERMINATED AT 5 FT												
10														
15														
20														
25														
30														
35														
40														
45														
50														

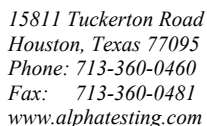




<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	2/10/2023	<b>End Date:</b>	2/10/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

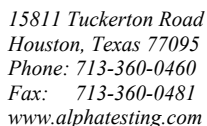
[illegible]





<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	4/27/2023	<b>End Date:</b>	4/26/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER AND WET ROTARY		

[illegible]



**BORING NO.:** 70  
Sheet 1 of 1

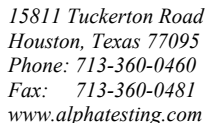
**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	4/26/2023	<b>End Date:</b>	4/26/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

**Location:** Tomball, TX  
**Surface Elevation:** 177'  
**West:**  
**North:**  
**Hammer Drop (lbs / in):** 140 / 30

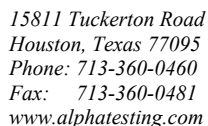
[illegible]





<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	4/26/2023	<b>End Date:</b>	4/26/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

[illegible]



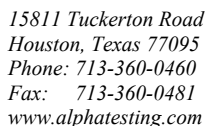
**BORING NO.:** 73  
Sheet 1 of 1

**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	4/26/2023	<b>End Date:</b>	4/26/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

**Location:** Tomball, TX  
**Surface Elevation:** 177'  
**West:**  
**North:**  
**Hammer Drop (lbs / in):** 140 / 30

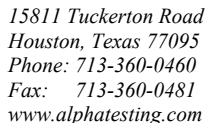
[illegible]



<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	4/27/2023	<b>End Date:</b>	4/26/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER AND WET ROTARY		

[illegible]





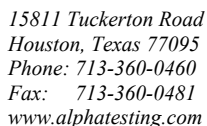
**BORING NO.:** 75  
Sheet 1 of 1

**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	4/27/2023	<b>End Date:</b>	4/26/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER AND WET ROTARY		

**Location:** Tomball, TX  
**Surface Elevation:** 176'  
**West:**  
**North:**  
**Hammer Drop (lbs / in):** 140 / 30

[illegible]



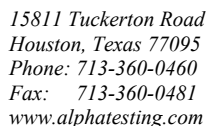
**BORING NO.:** 76  
Sheet 1 of 1

**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	5/4/2023	<b>End Date:</b>	5/4/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER AND WET ROTARY		

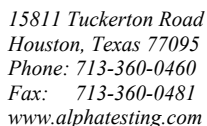
**Location:** Tomball, TX  
**Surface Elevation:** 176'  
**West:**  
**North:**  
**Hammer Drop (lbs / in):** 140 / 30

[illegible]



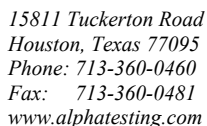
<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	4/26/2023	<b>End Date:</b>	4/26/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

[illegible]



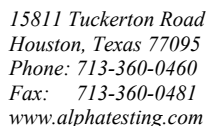
<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	4/27/2023	<b>End Date:</b>	4/26/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER AND WET ROTARY		

[illegible]



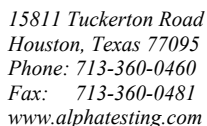
<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	4/26/2023	<b>End Date:</b>	4/26/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

[illegible]



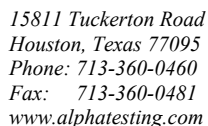
<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	4/26/2023	<b>End Date:</b>	4/26/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

[illegible]



<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	4/26/2023	<b>End Date:</b>	4/26/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER AND WET ROTARY		

[illegible]



<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	4/26/2023	<b>End Date:</b>	4/26/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

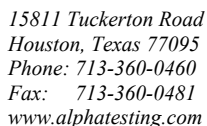
[illegible]



**Client:** Tomball ISD  
**Project:** TISD Juergen Rd High School  
**Start Date:** 5/4/2023 **End Date:** 5/4/2023  
**Drilling Method:** CONTINUOUS FLIGHT AUGER AND WET ROTARY

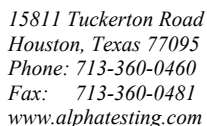
**Location:** Tomball, TX  
**Surface Elevation:** 175'  
**West:**  
**North:**  
**Hammer Drop (lbs / in):** 140 / 30

Depth, feet	Graphic Log	GROUND WATER OBSERVATIONS ▽ On Rods (ft): 25 ▼ After Drilling (ft): 25 ▽ After ____ Hours (ft):	Sample Type	Recovery % RQD	TX Cone or Std. Pen. (blows/ft, in)	Pocket Penetrometer (tsf)	Unconfined Comp. Strength (tsf)	% Passing No. 200 Sieve	Unit Dry Weight (pcf)	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Swell, %
MATERIAL DESCRIPTION														
5		Brown SANDY SILT with clay pockets - with perched water from 0' to 10'				7		60		11 13	NP	NP	NP	
10		Brown SANDY LEAN CLAY - reddish brown, light gray with sand seams from 6' to 8' - gray, light gray from 8' to 13'  - gray, brownish yellow from 13' to 28' - with sand seams and layers from 13' to 23'				0.75 1.0 1.0	0.5  0.4		124  116	15 14 14				
15						2.0			14	26	12	14		
20						0.5			14					
25						1.5			17					
30		Light gray SILTY SAND			34				19					
35					31				18					
40		Light gray, reddish brown FAT CLAY with slickensides  - reddish brown, light gray from 48' to 58'				3.0				19				
45					4.0			113	17					
50					4.5				23					
55					4.0			106	19					
60		Reddish brown, light gray SANDY SILT			27				19					
65	BORING TERMINATED AT 60 FT													
70														
75														
80														



<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	4/26/2023	<b>End Date:</b>	4/26/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER		

[illegible]





















**BORING NO.:** 85  
Sheet 1 of 1  
**PROJECT NO.:** H223322

<b>Client:</b>	Tomball ISD		
<b>Project:</b>	TISD Juergen Rd High School		
<b>Start Date:</b>	5/4/2023	<b>End Date:</b>	5/4/2023
<b>Drilling Method:</b>	CONTINUOUS FLIGHT AUGER AND WET ROTARY		






**Location:** Tomball, TX  
**Surface Elevation:** 175'  
**West:**  
**North:**  
**Hammer Drop (lbs / in):** 140 / 30

[illegible]

### SOIL & ROCK SYMBOLS

	(CH), High Plasticity CLAY
	(CL), Low Plasticity CLAY
	(SC), CLAYEY SAND
	(SP), Poorly Graded SAND
	(SW), Well Graded SAND
	(SM), SILTY SAND
	(ML), SILT
	(MH), Elastic SILT
	LIMESTONE
	SHALE / MARL
	SANDSTONE
	(GP), Poorly Graded GRAVEL
	(GW), Well Graded GRAVEL
	(GC), CLAYEY GRAVEL
	(GM), SILTY GRAVEL
	(OL), ORGANIC SILT
	(OH), ORGANIC CLAY
	FILL

### SAMPLING SYMBOLS

	SHELBY TUBE (3" OD except where noted otherwise)
	SPLIT SPOON (2" OD except where noted otherwise)
	AUGER SAMPLE
	TEXAS CONE PENETRATION
	ROCK CORE (2" ID except where noted otherwise)

### RELATIVE DENSITY OF COHESIONLESS SOILS (blows/ft)

VERY LOOSE	0 TO 4
LOOSE	5 TO 10
MEDIUM	11 TO 30
DENSE	31 TO 50
VERY DENSE	OVER 50

### COMPRESSIVE STRENGTH OF COHESIVE SOILS (tsf)

VERY SOFT	LESS THAN 0.25
SOFT	0.25 TO 0.50
FIRM	0.50 TO 1.00
STIFF	1.00 TO 2.00
VERY STIFF	2.00 TO 4.00
HARD	OVER 4.00

### RELATIVE DEGREE OF PLASTICITY (PI)

LOW	4 TO 15
MEDIUM	16 TO 25
HIGH	26 TO 35
VERY HIGH	OVER 35

### RELATIVE PROPORTIONS (%)

TRACE	1 TO 10
LITTLE	11 TO 20
SOME	21 TO 35
AND	36 TO 50

### PARTICLE SIZE IDENTIFICATION (DIAMETER)

BOULDERS	8.0" OR LARGER
COBBLES	3.0" TO 8.0"
COARSE GRAVEL	0.75" TO 3.0"
FINE GRAVEL	5.0 mm TO 3.0"
COURSE SAND	2.0 mm TO 5.0 mm
MEDIUM SAND	0.4 mm TO 5.0 mm
FINE SAND	0.07 mm TO 0.4 mm
SILT	0.002 mm TO 0.07 mm
CLAY	LESS THAN 0.002 mm

# DRAFT AIA® Document A101™ – 2017

## **Standard Form of Agreement Between Owner and Contractor** *where the basis of payment is a Stipulated Sum*

**AGREEMENT** made as of the «TBD» day of «January» in the year «2024»  
(In words, indicate day, month and year.)

**BETWEEN** the Owner:  
(Name, legal status, address and other information)

**Tomball Independent School District**  
**310 S. Cherry Street**  
**Tomball, Texas 77375**

and the Contractor:  
(Name, legal status, address and other information)

**TBD**

<< >>  
<< >>  
<< >>

for the following Project:  
(Name, location and detailed description)

**RFQ #947-23 – Tomball West High School**  
**A New 3,000 Student High School Campus**  
**17803 Cypress Heights Drive**  
**Cypress, Texas 77433**

The Architect:  
(Name, legal status, address and other information)

**Huckabee Architects**  
**1700 City Plaza Dr., Suite 125**  
**Spring, Texas 77389**

The Owner and Contractor agree as follows.

### **ADDITIONS AND DELETIONS:**

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

The parties should complete A101™-2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201™-2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

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## TABLE OF ARTICLES

- 1 THE CONTRACT DOCUMENTS
- 2 THE WORK OF THIS CONTRACT
- 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
- 4 CONTRACT SUM
- 5 PAYMENTS
- 6 DISPUTE RESOLUTION
- 7 TERMINATION OR SUSPENSION
- 8 MISCELLANEOUS PROVISIONS
- 9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS  
EXHIBIT B PROJECT MANAGEMENT SOFTWARE

### ARTICLE 1 THE CONTRACT DOCUMENTS

§ 1.1 The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions as well as the RFP Document in Total unless specifically modify at execution of the Agreement), all sections of the Project Manual, including Drawings, Specifications, and Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and written Modifications signed by both parties that are issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. As used in the Contract Documents, the terms “AIA Document A201 – 2017”, “General Conditions”, “General Conditions of the Contract for Construction” or “A201-2017” shall refer to the General Conditions document that pertains to the Project, as modified or amended by the Owner for the project. This Agreement represents the entire and integrated agreement between the Owner and the Contractor and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9. In the event of conflict, terms and conditions contained in the Agreement shall take precedence over terms and conditions contained in the General Conditions, and the terms and conditions in the General Conditions, shall take precedence over all other terms and conditions contained in the other Contract Documents. If the Request for Proposals and the Proposal are included in the Contract Documents, then the Request for Proposals shall take precedence over the Proposal, unless specifically agreed otherwise herein.

§ 1.2 The Board of Trustees, by majority vote, is the only representative of the Owner, an independent school district, having the power to enter into or amend a contract, to approve and execute a Change Order valued at or above \$50,000 or Construction Change Directive that would increase the Contract Sum more than \$50,000, or to agree to an extension to the date of Substantial or Final Completion.

§ 1.3 The Board designates the authorized representatives identified in Paragraph 8.3 to act on its behalf in other respects.

### ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

## ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:

(Check one of the following boxes.)

[ ☐ ] The date of this Agreement.

[ ☐ ] A date set forth in a notice to proceed issued by the Owner.

[ ☒ ] Established as follows:

(Insert a date or a means to determine the date of commencement of the Work.)

« The date of commencement shall be the day that the Contractor receives a Notice to Proceed (NTP) from the Owner with any limitations or restrictions. An NTP may precede the date of execution of this Agreement. If a Building Permit is not available or other approvals are not available for the entire Project, the Contractor must commence work on those portions of the Project that do not require a Building Permit or other approvals on receipt of an NTP. Work at the Project site shall not begin until Owner has received all required payment and performance bonds and insurance. This project is located and within the Jurisdiction of Harris County.»

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work, not by calendar days but by the Commencement Date and the Substantial Completion Date.

### § 3.3 Substantial and Final Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:

(Check one of the following boxes and complete the necessary information.)

[ ☐ ] Not later than ☐ ( ☐ ) calendar days from the date of commencement of the Work.

[ ☒ ] By the following date: «May 30, 2026»

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

#### Portion of Work

«All of the Athletics Fields, Flatwork, Outbuildings, Support Facilities and Infrastructure including Power, Lighting, Data (pathway) Domestic water, Irrigation, Storm Water, Sewer, Roads and Parking Lots within the confines of the encircling curb line. This requirement is not for early District use.

Final Completion is required by:»

#### Substantial Completion Date

October 15, 2025

May 30, 2026

§ 3.3.3 If the Contractor fails to achieve Substantial Completion or Final Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

§ 3.3.4 Subject to adjustments of the Contract Time as provided in the Contract Documents, Final Completion shall be 60 calendar days after the date of Substantial Completion.

## ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be « » (\$ « »), subject to additions and deductions as provided in the Contract Documents.

### § 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price
«TBD»	

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement. (Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance
«TBD»		

§ 4.3 Allowances, if any, included in the Contract Sum:  
(Identify each allowance.)

Item	Price
«Owner Betterment Allowance »	\$7,000,000.00

§ 4.3.1 The Contract Sum contains an Owner's Contingency / Owner Betterment Allowance. This contingency is for the sole use of the Owner to be used for changes in the scope of the Work and for the betterment of the Project. Owner's authorized representative may approve any expenditure from Owner's Contingency without further Board approval. Pending review of the scope and cost, a need to notify the Board prior to proceeding. If the Owner's Contingency is not expended or not fully expended, then any unused portion shall belong to the Owner and shall be credited to the Owner in calculating final payment.

§ 4.4 Unit prices, if any:  
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price per Unit (\$0.00)
«TBD»		

§ 4.5 Liquidated damages, if any:  
(Insert terms and conditions for liquidated damages, if any.)

« \$2,000 per Calendar Day »

§ 4.6 Other:  
(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

«Not Applicable»

## ARTICLE 5 PAYMENTS

### § 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

«Submission of a draft copy shall be presented to the Architect and Owner no later than the 21<sup>st</sup> of each month or the first business day immediately after this date when the 21<sup>st</sup> falls on a weekend. The Architect will proceed with



review and verification of the work complete comparing it to the percentage invoiced. The Program Manager will review concurrently for administrative correctness. Once a final “draft” is complete, the Contractor shall submit into Project Mates the assumed final copy for processing. It is incumbent upon the Contractor to ensure there are no mathematical errors exist and that all supporting backup documentation requested or required is included. Until the Application for Payment has passed all involved parties, it is not assumed to be correct and timing on payment does not begin. »

**§ 5.1.3** The Contractor shall submit monthly Applications for Payment to both the Architect and Program Manager, if applicable, on AIA Form G702 for approval. Continuation sheets shall be submitted on AIA Form G703. If the Architect and Program Manager, if applicable, approve the application, then they shall submit a Certificate for Payment to the Owner. The Architect and Program Manager, if applicable, may require any additional information deemed necessary and appropriate to substantiate the Application for Payment. Materials that are verified to be on the jobsite or other approved location for use in the Project may also be incorporated into the Application for Payment. The Architect and Program Manager, if applicable, shall have seven (7) days from date of receipt from the Contractor of an Application for Payment to approve or reject all or any part of the Application for Payment. The Owner shall pay the undisputed amounts certified by the Architect and Program Manager, if applicable, to the Contractor within forty-five (45) days of receipt of the Certificate for Payment from the Architect and Program Manager, if applicable, unless otherwise provided in the Contract Documents. Undisputed amounts unpaid after the date on which payment is due shall bear interest pursuant to Texas Government Code Section 2251.025.

**§ 5.1.4** Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum, less any unused Owner’s contingency, among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require, but shall contain as a minimum, individual line items for each section of the table of contents of the Project Manual separated by material costs and labor costs. Additionally, General Conditions costs shall be separated into individual line items. Each Application for Payment shall also include a list, with backup data, of how each payment shall be spent, including a list detailing which subcontractors and suppliers will be paid out of funds paid by the Owner and the amount of such payments to subcontractors and suppliers. Additionally, beginning with the second application for payment, proof of each payment to Contractor’s subcontractors and suppliers for payment within 61-days after payment. The Application for Payment shall be submitted on a schedule of values basis. This schedule of values shall be used as a basis for reviewing the Contractor’s Applications for Payment.

**§ 5.1.5** Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

**§ 5.1.6** In accordance with AIA Document A201™–2017, as modified by the Owner for the project, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be provided using the AIA G702 and G703 format and computed as follows:

**§ 5.1.6.1** The amount of each progress payment shall first include:

- .1 That portion of the Contract Sum properly allocable to completed Work;
- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect’s professional judgment, to be reasonably justified.

**§ 5.1.6.2** The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017, as modified by the Owner for the project;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017 as modified by the Owner for the project; and

**.5 Retainage withheld pursuant to Section 5.1.7.**

**§ 5.1.6.3** If Owner is entitled to deduct liquidated damages, or any other damages or amounts provided in the Contract Documents, including clean-up fees, then Owner shall be entitled to deduct such liquidated damages, amounts and fees at any time.

**§ 5.1.6.4** If Contractor fails or refuses to complete the Work, or has unsettled claims with Owner, any payment to Contractor shall be subject to deduction for such amounts as the Architect and Program Manager, if applicable, shall determine as the cost for completing incomplete Work and the value of unsettled claims.

**§ 5.1.6.5** Payments shall be made on account of materials and equipment (a) incorporated in the Work, (b) suitably stored at the Project site, or (c) suitably stored at some off-site location provided the following conditions are met for off-site storage:

- .1** The location must be agreed to, in writing, by the Owner and Surety;
- .2** The location must be a bonded warehouse;
- .3** The surety must agree, in writing, to each request for payment; and
- .4** The Contractor must bear the cost of the Owner's and Architect's expenses related to visiting the off-site storage area.

Payment for materials and/or equipment stored on or off the site shall be conditioned upon submission by the Contractor of bills of sale or such other procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance (naming the Owner as additional insured) and transportation to the site for those materials and equipment stored off the site. Under no circumstances will the Owner reimburse the Contractor for down payments, deposits, or other advance payments for materials or equipment. All material or equipment being invoiced for as stored are subject to physical inspection at the site they are stored. The Contractor shall ensure access. Delays stemming from lack of or slow access will impact the review of Applications for Payment. When stored materials or equipment will be invoiced, written notice to the Architect and Owner shall be made a week prior to submission of the Application for Payment to allow time to determine need and/or schedule a verification. It is the Contractor's sole responsibility to provide all necessary proof of existence and insurance as required in this Agreement prior to the Architect's or Owner's physical verification.

**§ 5.1.7 Retainage**

**§ 5.1.7.1** For each progress payment made prior to Final Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

*(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)*

«Five percent (5%) »

**§ 5.1.7.1.1** The following items are not subject to retainage:

*(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)*

« »

**§ 5.1.7.2** Reduction or limitation of retainage, if any, shall be as follows:

*(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)*

«No reduction allowed prior to Final Completion. »

**§ 5.1.7.3** Except as set forth in this Section 5.1.7.3, upon Final Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Final Completion shall not include retainage as follows:

*(Insert any other conditions for release of retainage upon Final Completion.)*

«As-built drawings and all other closeout documents shall be submitted with all final punch list items completed unless provision has been made by written approval. All closeout documents shall be accepted as accurate by the Architect before any Retainage will be released. »

**§ 5.1.8** If Final Completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts payable in accordance with Article 9 of AIA Document A201–2017, as modified by the Owner for the Project.

**§ 5.1.9** Except with the Owner's prior written approval or as otherwise provided in Section 9.3.2 of the AIA Document A201-2017, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site. If the Contractor wishes to bill for materials or equipment which cannot be stored on site, the Contractor shall, along with the request for approval, provide evidence of purchase, evidence of delivery in good order without damage, and a certificate of insurance specifically covering the material identified by way of serial numbers, bill of lading, and copy of signature of receipt of materials and photography showing material. The Contractor shall also require, proof that the facility at which the materials or equipment is stored is bonded. Security and protection from theft and damage remains on the Contractor as the first line of accountability and financial responsibility. Delays due to issues arising from stored materials shall not be considered as reasonable justification to release the Contractor from meeting the schedule unless the Owner agrees to such delay in writing in advance of any delay.

## **§ 5.2 Final Payment**

**§ 5.2.1** Final payment, constituting the entire unpaid balance of the Contract Sum, minus disputed sums, authorized deductions, and liquidated damages, shall be made by the Owner to the Contractor after

- .1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct nonconforming Work as provided in Article 12 of AIA Document A201–2017, as modified by the Owner for the project, and to satisfy other requirements, if any, which extend beyond final payment;
- .2 the Contractor has provided all documents required by Section 3.5 et seq. and 9.10.2 of AIA Document A201-2017; and
- .3 a final Certificate for Payment has been issued by the Architect.

**§ 5.2.2** The Owner's final payment to the Contractor shall be made no later than 45 days after Owner's Board's vote or other required approval pursuant to applicable policy. Undisputed amounts unpaid after the date on which payment is due shall bear interest pursuant to Texas Government Code Section 2251.025.

«Whether time or money, a Change Order will be issued to resolve and settle the final payment and contractor release from daily responsibility. Warranty management and performance remains as required by the contract.»

## **§ 5.3 Interest**

Payments due and unpaid under the Contract shall bear interest at the rate established by Texas Government Code Chapter 2251.

## **ARTICLE 6 DISPUTE RESOLUTION**

### **§ 6.1 Initial Decision Maker**

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, as modified by the Owner for the project, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.

*(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)*

« »  
« »  
« »  
« »

### **§ 6.2 Binding Dispute Resolution**

For any Claim or dispute between the parties, the method of binding dispute resolution shall be as follows:

*(Check the appropriate box.)*

[ «☐» ] Arbitration pursuant to Section 15.4 of AIA Document A201–2017

[ «X☐» ] Litigation in a court of competent jurisdiction

[ «☐» ] Other (*Specify*)

«☐»

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

## ARTICLE 7 TERMINATION OR SUSPENSION

**§ 7.1** The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017, as amended by the Owner for the Project.

**§ 7.1.1** If the Contract is terminated for the Owner’s convenience in accordance with Article 14 of AIA Document A201–2017, as amended by the Owner for the project, then the Owner shall pay the Contractor a termination fee as follows:

*(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner’s convenience.)*

«As described in AIA Document A201-2017, as amended by the Owner for the project. »

**§ 7.2** The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017, as amended by the Owner for the project.

## ARTICLE 8 MISCELLANEOUS PROVISIONS

**§ 8.1** Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

**§ 8.2** The Owner’s Designated representative:

*(Name, address, email address, and other information)*

The Owner’s Board of Trustees, by majority vote at a duly noticed and lawfully called public meeting, is the only representative of Owner, a Texas independent school district organized under the laws of the State of Texas, having the power to enter into a contract, to execute a change order in an amount of \$50,000 or more, or to agree to an extension to the contractual completion date, unless this authority is lawfully delegated. The Board may designate in writing an authorized representative (or representatives), as appropriate, to act on its behalf during the course of construction. Such authorized representative shall have authority to act on behalf of the Owner concerning decisions that do not require a majority vote of the Board of Trustees and shall have the authority to bind the Owner only to the extent expressly authorized or delegated by the Board of Trustees. The authorized representative shall have no implied authority. Such authorized representative shall also bring recommendations to the Board of Trustees on any matter requiring Board approval. In the event that changes in the scope of the Work are required before the Board’s next regularly scheduled meeting or in order to facilitate and expedite the timely completion of the Work, the Board’s authorized representative shall have authority to approve construction changes that do not exceed \$50,000.00 in increased costs. Any such change shall be confirmed in writing between the Contractor and the Board’s authorized representative and notice of such approved changes shall be given to the Board at its next regularly scheduled meeting. The Board shall act as soon as reasonably possible to avoid unnecessary delays in the construction completion date. Except as expressly authorized by the Owner or the Contract Documents, the Architect does not have the authority to bind the Owner. The term “Owner” means the Owner or the Owner’s authorized representative.

**§ 8.3** The Owner’s authorized representative:

«Superintendent of Schools »

« »

« »

<< >>  
<< >>  
<< >>

**§ 8.3** The Contractor's representative:  
(Name, address, email address, and other information)

«TBD »  
<< >>  
<< >>  
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**§ 8.4** The Contractor's representative shall be changed without ten days' prior notice to the other party.

**§ 8.5 Insurance and Bonds**

**§ 8.5.1** The Contractor shall purchase and maintain insurance as set forth in Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

**§ 8.5.2** The Contractor shall provide bonds as set forth in AIA Document A101™–2017 Exhibit A, and elsewhere in the Contract Documents.

**§ 8.6** All notices required to be given under the Contract must be in writing. Any notice required or permitted to be given under the Contract shall be deemed delivered, whether or not actually received, three days after it is deposited in the U.S. Mail, when sent by certified mail, return receipt requested, postage prepaid, and correctly addressed to the party at the address provided in this Agreement. Notice given in any other manner shall be deemed delivered when actually received. Either party may change its address for notice by giving notice of the change of address in accordance with this provision. The Architect must be copied on notices sent to the Owner.

**§ 8.7** Other provisions:

<< >>

**§ 8.7.1** The subject of this Contract is a public school facility which is governed by School Facilities Standards promulgated by the State Board of Education and said project must be constructed in compliance with these Standards. Upon request, Owner, its authorized agent, its Architect, and/or its Engineer shall make available information related to the School Facilities Standards necessary for compliance with said Standards.

**§ 8.7.2** The Owner is an organization exempt from Texas taxes. Owner shall not be responsible for sales, consumer, use, and similar taxes on labor, materials, equipment, systems, and other items purchased for the project which Owner would ordinarily be exempt. A tax exemption certificate is available upon request by the Contractor.

**§ 8.7.3** All provisions in the Contract Documents that mandate arbitration are expressly deleted and rendered null and void.

**§ 8.7.4** Subcontracts, purchase orders and rental agreements entered into by the Contractor shall contain provisions permitting assignment to the Owner upon default by Contractor under the Contract Documents. If the Owner accepts such assignment, the Owner shall be responsible for the payment of amounts which would have been reimbursable to Contractor under this Agreement and for which payment has not already been made to the Contractor. Contractor shall be responsible for the payment of any other amounts payable under the Contract. If the Owner elects not to accept the assignment of any subcontract, purchase order or rental agreement which would have constituted a Cost of the Work had this agreement not been terminated, the Contractor shall terminate such subcontract, purchase order or rental agreement.

**§ 8.7.5** Unless the context of this Agreement otherwise clearly requires, references to the plural include the singular, the term "including" is not limiting and the terms "hereof," "herein," "hereunder" and similar terms in the Contract Documents refer to the Contract Documents as a whole and not to any particular provision thereof, unless stated otherwise. Additionally, the parties hereto acknowledge that they have carefully reviewed this Agreement and have been advised by counsel of their choosing with respect thereto, and that they understand its contents and agree that



this Agreement shall not be construed more strongly against any part hereto regardless of who is responsible for its preparation.

**§ 8.7.6** In the event of any suit or action arising out of or in connection with any of the Contract Documents, the prevailing party in such proceedings shall be entitled to recover reasonable attorney fees and court costs.

**§ 8.7.7** Any provision in the Contract Documents to the contrary notwithstanding, if any of the facilities to be constructed or modified under this Agreement or the Contract require the issuance of a Certificate of Occupancy or other regulatory approval, then Substantial Completion of any such facilities shall not be deemed to have been attained for those facilities prior to the date on which an unconditional Certificate of Occupancy or other regulatory approval is obtained.

**§ 8.7.8** If the building will be used or occupied by the Owner or members of the public, the Contractor shall be responsible for maintaining safe routes of travel from sidewalks and parking areas to the building, and shall reroute access as necessary to maintain safe access during construction at no additional cost beyond the agreed contract amount.

**§ 8.7.9** By signing this Agreement or providing or causing to be provided a certificate of coverage, the Contractor is certifying to the Owner that all employees of the Contractor who will provide services on the Project will be covered by workers' compensation coverage for the duration of the Project. Contractor is also representing that it will require all subcontractors to provide workers' compensation coverage on all employees who will provide services on the Project for the duration of the Project and to provide written certifications of such coverage to the Contractor. The Contractor will provide the certifications to Owner. Providing false or misleading information may subject the Contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions. The Contractor's failure to comply with any of these provisions is a breach of contract by the Contractor which entitles the Owner to declare the contract void if the Contractor does not remedy the breach within ten days after receipt of notice of breach from the Owner.

**§ 8.7.10** The Contractor shall, as a condition precedent to allowing any subcontractor to proceed with any work on the Project, either require that the subcontractor provide proof of the existence of workers' compensation coverage for its employees, or, at the Contractor's sole discretion, provide for coverage of the subcontractor's employees under the Contractor's workers' compensation insurance coverage. The Contractor shall maintain records of all required certificates of insurance provided by the subcontractors, and shall forward copies to the Owner and the Architect.

**§ 8.7.11** Warranty. The Contractor shall be responsible for the coordination of warranty work, if any during the first year after Substantial Completion of the Entire Work.

**§ 8.7.12** No provision of this Agreement shall waive any immunity or defense. No provision of this Agreement is a waiver of any immunity or a consent to suit.

**§ 8.7.13** The Owner's competitive procurement solicitation documents/packet and the response of the Contractor to same are incorporated herein by reference as if copied verbatim. The Contractor agrees to comply with all requirements incorporated or included in the competitive procurement solicitation documents/packet by the Owner

**§ 8.7.14** The Contractor shall record the progress of the Project. On a monthly basis, or as otherwise agreed to by the Owner, the Contractor shall submit written progress reports to the Owner and Architect, showing percentages of completion and other information required by the Owner. The Contractor shall also keep, and make available to the Owner and Architect, a daily log containing a record for each day of weather, portions of the Work in progress and accomplished, Subcontractors working on the site, number of workers on site, identification of equipment on site, problems that might affect progress of the work, accidents, injuries, and other information required by the Owner. The log shall be available to the Owner and Architect at any time during work hours and shall be presented for discussion at the project progress meetings.

**§ 8.7.15** If (a) Contractor is not a sole proprietorship; (b) Contractor has ten (10) or more full-time employees; and (c) this Agreement has a value of \$100,000 or more, the following certification shall apply; otherwise, this certification is not required. Pursuant to Chapter 2270 of the Texas Government Code, the Contractor hereby

certifies and verifies that neither the Contractor, nor any affiliate, subsidiary, or parent company of the Contractor, if any (the “Contractor Companies”), boycotts Israel, and the Architect agrees that the Contractor and Contractor Companies will not boycott Israel during the term of this Agreement. For purposes of this Agreement, the term “boycott” shall mean and include refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes.

**§ 8.7.16** Contractor verifies and affirms that it is not a foreign terrorist organization as identified on the list prepared and maintained by the Texas Comptroller of Public Accounts. If Contractor misrepresents its inclusion on the list, then such omission or misrepresentation shall void this Agreement.

**§ 8.7.17** If Contractor is not a governmental body and (a) this Agreement has a stated expenditure of at least \$1 million in public funds for the purchase of goods or services by Owner; or (b) this Agreement results in the expenditure of at least \$1 million in public funds for the purchase of goods or services by Owner in a fiscal year of Owner, the following certification shall apply; otherwise, this certification is not required. As required by Tex. Gov’t Code § 552.374(b), the following statement is included in the RFP and the Agreement (unless the Agreement is (1) related to the purchase or underwriting of a public security; (2) is or may be used as collateral on a loan; or (3) proceeds from which are used to pay debt service of a public security of loan): “The requirements of Subchapter J, Chapter 552, Government Code, may apply to this RFP and Agreement and the Contractor agrees that the Contract can be terminated if the Contractor knowingly or intentionally fails to comply with a requirement of that subchapter.” Pursuant to Subchapter J, Chapter 552, Texas Government Code, the Contractor hereby certifies and agrees to (1) preserve all contracting information related to this Agreement as provided by the records retention requirements applicable to Owner for the duration of the Agreement; (2) promptly provide to Owner any contracting information related to the Agreement that is in the custody or possession of the Contractor on request of Owner; and (3) on completion of the Agreement, either (a) provide at no cost to Owner all contracting information related to the Agreement that is in the custody or possession of Contractor, or (b) preserve the contracting information related to the Agreement as provided by the records retention requirements applicable to Owner.

**§ 8.7.18** Program Manager shall have, and is hereby granted by Owner, full and complete power, authority, and discretion to act for, and in the name, place, and stead of, Owner in carrying out and discharging the responsibilities and obligations of Program Manager under the Agreement between the Owner and Program Manager; provided, however, that Program Manager shall have no right or authority, express or implied, to commit or otherwise obligate Owner in any manner whatsoever except to the extent specifically provided in the Agreement between the Owner and the Program Manager or specifically authorized in writing by Owner. In no event shall Program Manager be authorized to execute any documents, agreements, or other instruments on behalf of Owner without written approval by Owner. In no event shall Program Manager have the authority to modify completion dates of the Project Schedule without written approval by Owner. Program Manager shall have the authority to modify interim milestones dates not affecting the completion dates specified in the Agreements between the parties. In no event shall Program Manager have the authority to modify contract value of the Project without written approval by Owner. Program Manager shall have the authority to modify budgets, contingencies, allowances and similar accounting tasks not affecting the contract value specified in the Agreements between the parties. In no event shall Program Manager have the authority to relax or to bind the Owner to codes and standards imposed by the Authorities Having Jurisdiction, unless authorized in writing by the Owner.

**§ 8.7.19** The Contractor shall utilize online project management software in the manner described in Exhibit B Project Management Software.

There is a cost associated with this software. The software requires single user licenses, and the Contractor shall consider how many seats of the software and annual renewal premiums fees which are not considered reimbursable and shall be a part of the General Conditions. Cost per seat is \$795 ea with a \$695 for each annual renewal.

## **§ 8.8 Governing Law and Venue**

**§ 8.8.1** Section 13.1 of the General Conditions document pertaining to the Project, as modified by the Owner, shall apply to the Agreement, the Contract, and the Contract documents in all respects. No provision of this Agreement is a waiver of any immunity, defense, or a consent to suit.

## **§ 8.8.2 Venue**

To the maximum extent permitted by applicable law, the parties expressly agree that the exclusive venue and place of trial for any action brought under or in connection with or in any way related to the Work, the Project, the Agreement, the Contract, or any of the Contract Documents shall be in the state district courts of Harris County, Texas, and the parties hereby waive any and all objections to the agreed-upon venue as stated herein. The Contract, including but not limited to the Agreement and all other Contract Documents, is performable entirely in Harris County, Texas.

### § 8.9 Severability

If any provision or part of the Contract Documents is held to be illegal, invalid, or unenforceable under any present or future law or regulation, such provision shall be fully severable and the Contract Documents shall be construed and enforced as if such illegal, invalid or unenforceable provision had never comprised a part of the Contract Documents. The remaining provisions of the Contract Documents shall remain in full force and effect and shall not be affected by the illegal, invalid, or unenforceable provision or by its severance.

### § 8.10 Information and Services Required of the Owner

§ 8.10.1 Pursuant to the requirements of the Texas Business and Commerce Code section 56.054(e)(3), the Owner represents that funds are available and have been authorized for the full contract amount of the work.

## ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor, as modified by Owner for the Project
- .2 Exhibit A, Insurance and Bonds
- .3 AIA Document A201™–2017, General Conditions of the Contract for Construction, as modified by the Owner for the project
- .4 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:  
(Insert the date of the E203-2013 incorporated into this Agreement.)

« »

- .5 Drawings

Number	Title	Date
« »		

- .6 Specifications

Section	Title	Date	Pages
« »			

- .7 Addenda, if any:

Number	Date	Pages
« »		

Portions of Addenda relating to bidding or competitive purchasing requirements are not part of the Contract Documents unless the bidding or competitive purchasing requirements are also enumerated in this Article 9.

- .8 Other Exhibits:

(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[ « » ] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:  
(Insert the date of the E204-2017 incorporated into this Agreement.)

« »



[ « » ] The Sustainability Plan:

Title	Date	Pages
« »		

[ « » ] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
« »			

**.9** Other documents, if any, listed below:

*(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™-2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)*

« »

- .1** Owner's competitive procurement solicitation documents and Contractor's responses and proposals to same.
- .2** The Project Manual for the Project, including all sections to same, whether issued or created prior to or after the execution of this Agreement.
- .3** Statutory Payment and Performance Bonds.
- .4** Certificates of Insurance required of the Contractor.
- .5** All documents listed or described in Section 1.1.1 of AIA Document A201-2017, as amended by the Owner.
- .6** Scale/Schedule of Prevailing Wages (attached as Exhibit A to the AIA Document A201-2017, General Conditions of the Contract for Construction, as modified by the Owner for the project) and incorporated herein as if fully set forth.
- .7** Any modifications to this Agreement or to the Contract or any Contract Documents approved by the Parties.
- .8** Any documents stated in this Agreement as being a part of or incorporated into this Agreement or the Contract
- .9** Exhibit B – Project Management Software

This Agreement entered into as of the day and year first written above.

« »

\_\_\_\_\_  
**OWNER (Signature)**

« »« »

\_\_\_\_\_  
*(Printed name and title)*

\_\_\_\_\_  
*(Date)*

« »

\_\_\_\_\_  
**CONTRACTOR (Signature)**

« »« »

\_\_\_\_\_  
*(Printed name and title)*

\_\_\_\_\_  
*(Date)*



# DRAFT AIA® Document A201™ – 2017

## General Conditions of the Contract for Construction

for the following PROJECT:  
(Name and location or address)

**RFQ #947-23 – Tomball West High School  
A New 3,000 Student High School Campus  
17803 Cypress Heights Drive  
Cypress, Texas 77433**

**THE OWNER:**  
(Name, legal status and address)

**Tomball Independent School District  
310 S. Cherry Street  
Tomball, Texas 77375**

**THE ARCHITECT:**  
(Name, legal status and address)

**Huckabee Architects  
1700 City Plaza Dr., Suite 125  
Spring, Texas 77389**

**THE PROGRAM MANAGER:**  
(Name, legal status and address)

**Lockwood, Andrews, & Newnam, Inc.  
2925 Briarpark Drive, Suite 400  
Houston, TX 77042-3720**

The Owner may retain Program Manager(s) to carry out some of the functions of the administration of the Owner's construction program. The Contractor, Architect, and Program Manager (when applicable) shall cooperate with each other in the performance of their respective functions. The management and reporting systems used by the Owner and/or Program Manager, including the assignment of the Program Manager, may be changed by Owner during the Project.

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#### ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

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7	CHANGES IN THE WORK
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10	PROTECTION OF PERSONS AND PROPERTY
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## ARTICLE 1 GENERAL PROVISIONS

### § 1.1 Basic Definitions

#### § 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect or the Owner. All sections of the Project Manual shall be a part of the Contract Documents. The solicitation documents used by the Owner, including advertisement or Requests for bids or Proposals, Instructions to Bidders, other information furnished by the Owner in anticipation of receiving bids or proposals, and Addenda relating to such solicitation documents, except to the extent that the proposal has been modified by the terms of the Contract shall be a part of the Contract Documents. Any reference to any Contract Documents shall mean the document as amended and/or supplemented for this Project.

#### § 1.1.2 The Contract

The Contract Documents form the Contract for Construction (the “Contract”) and are as fully a part of the Contract as if attached hereto or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. After execution of the original Contract Documents, the Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect’s consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect’s consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect’s duties.

**§ 1.1.2.1** To be effective, all Contract Documents requiring signatures must be signed first by the Contractor and then by the Owner’s authorized representative, after approval by Owner’s Board of Trustees, unless otherwise delegated. If an approved Contract Document requiring signature has not been signed, then the missing signature shall be provided within a reasonable period of time. Failure to sign an approved Contract Document after notice and a reasonable opportunity to sign shall be considered a material breach of the Contract. Contractor’s signing of the Agreement shall be considered as signing all Contract Documents identified therein.

**§ 1.1.2.2** After execution of the original Contract Documents, the Contract may thereafter be amended or modified only by a written Modification signed by Contractor, approved by Owner’s Board of Trustees, unless otherwise delegated, and signed by an authorized representative of Owner’s Board of Trustees. As a material consideration for the making of the Contract, Modifications to the Contract shall not be construed against the maker of said Modifications.

**§ 1.1.2.3** In the event of conflict, the order of precedence of the Contract Documents shall be as listed in the Agreement. Terms and conditions contained in the Agreement shall take precedence over terms and conditions contained in the General Conditions, and the terms and conditions in the General Conditions shall take precedence over all other terms and conditions contained in the other Contract Documents, except for Exhibit A, “Insurance and Bonds,” attached to the Agreement, which shall take precedence over the General Conditions. An enumeration of the Contract Documents and their order of precedence, other than a Modification, appear in Article 9 of the AIA A101, as modified by the Owner for the Project

**§ 1.1.2.4** Any reference to the Agreement, General Conditions, or any other Contract Document shall mean the document as amended and/or supplemented for this Project.

#### § 1.1.3 The Work

The term “Work” means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor’s obligations. The Work may constitute the whole or a part of the Project. The Work includes all of Contractor’s responsibilities as to all labor, parts, supplies, skill, supervision, transportation services, storage requirements, and other facilities and things necessary, proper or incidental to the carrying out and completion of the terms of the Contract Documents and all other items of cost or value needed to

produce, construct, and fully complete the public Work identified by the Contract Documents. The Contract Documents include all Construction Documents, such as Drawings and Specifications that establish in detail the quality levels of materials and systems required for the Project. The Construction Documents shall reflect all agreements between Owner and Architect concerning Owner's budgetary constraints, programmatic needs, and expectations as to quality, functionality of systems, maintenance costs, and usable life of equipment and facilities. Said Construction Documents shall reflect the Owner's educational program and educational specifications, the State educational adequacy, safety, and security standards in 19 TAC Section 61.1040, and any other standards to which the Architect is subject pursuant to applicable law or contract. The Architect shall provide Construction Documents which are sufficient for Owner to complete construction of the Project.

#### **§ 1.1.4 The Project**

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

#### **§ 1.1.5 The Drawings**

The Drawings are the graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

#### **§ 1.1.6 The Specifications**

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

#### **§ 1.1.7 Instruments of Service**

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials or documents, including those in electronic form, prepared by the Architect and the Architect's consultants and shall set forth in detail the requirements for construction of the Project.

#### **§ 1.1.8 Initial Decision Maker**

The Initial Decision Maker is the person identified in the Agreement to render initial decisions or recommendations on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

#### **§ 1.1.9 Project Manual**

The Project Manual is a volume assembled for the Work which includes the bidding or proposal requirements, sample forms, Conditions of the Contract and Specifications.

#### **§ 1.1.10 Project Manual Addenda**

Project Manual Addenda are written, or graphic instruments issued prior to the execution of the Contract, which modify or interpret the bidding or proposal documents, including Drawings and Specifications, by additions, deletions, clarifications, or corrections. Addenda will become part of the Contract Documents when the Agreement is executed. The Contractor and Subcontractors shall include all addenda items on their copies of the Drawings and Specifications.

**§ 1.1.11** The terms "bids" or "bidding" shall include any kind of competitive purchasing/procurement under Texas Government Code Chapter 2269.

#### **§ 1.1.12 Abbreviations**

AIA:	American Institute of Architects
AIEE:	American Institute of Electrical Engineers
ACI:	American Concrete Institute
AHERA:	Asbestos Hazardous Emergency Response Act
AISI:	American Iron and Steel Institute
AISC:	American Institute of Steel Construction

ANSI:	American National Standards Institute
ASA:	American Standards Association
ASTM:	American Society of Testing Materials
AWSC:	American Welding Society Code
CERCLA:	Comprehensive Environmental Response, Compensation, and Liability Act
EPA:	Environmental Protection Agency
FS:	Federal Specification
NEC:	National Electrical Code
NIC:	Not in Contract (indicates work not to be done by this Contractor under this Agreement)
OSHA:	Occupational Safety and Health Administration
SPR:	Simplified Practice Recommendation
TAS:	Texas Accessibility Standards
UL:	Underwriters Laboratories, Inc.

### § 1.1.13 Miscellaneous Other Words

§ 1.1.13.1 Calendar Days: The days of the Gregorian calendar. The Contract Time is established in Calendar Days and extensions of time granted for Regular Work Days lost, if any, will be converted to Calendar Days.

§ 1.1.13.2 Holidays: The days officially recognized by the construction industry in this area as a holiday; limited to the observance days of New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day and the day after, and Christmas Day.

§ 1.1.13.3 Regular Work Days: All calendar days except holidays and Sundays. Requests for extensions of time shall be requested on the basis of Regular Work Days

§ 1.1.13.4 Anticipated Adverse Weather Days: An allowance of Regular Work Days established as probable days lost due to weather delays; said allowance to be included in the Contractor's Completion Time.

§ 1.1.13.5 Adverse Weather Days: Regular Work Days when rain, flooding, snow, unusually high winds, excessively wet grounds, or similar circumstances prevent progress on Critical Path portions of the Work. The Contractor will be entitled to an extension of the Contract Time for the net additional time, if any, which results from deducting the amount of Anticipated Adverse Weather Days from the total amount of approved Adverse Weather Days.

§ 1.1.13.5.1 Further, Adverse Weather is defined as the occurrence of one or more of the following conditions within a twenty-four (24) hour day that prevents construction activity exposed to weather conditions or access to the site and is readily apparent and easily demonstrated that it was cause for delay:

1. Precipitation (rain, snow, or ice) in excess of twenty-five one hundredths of an inch (0.25") liquid measure, hereafter referred to as Standard Baseline.
2. Temperatures that do not rise above that required for the day's construction activity, if such temperature requirement is specified or accepted as standard industry practice.
3. Sustained wind in excess of twenty-five (25) m.p.h.
4. "dry-out" or "mud" days resulting from precipitation that occur beyond the standard baseline; only if there is a hindrance to site access or sitework and Contractor has taken all reasonable accommodations to avoid such hindrance; and, at a rate no greater than 1 make-up day for each day or consecutive days of precipitation beyond the Anticipated Adverse Weather Days that total 1.0 inch or more, liquid measure.
5. Adverse weather prevents work on the project for fifty percent (50%) or more of the Contractor's scheduled work day and critical path construction activities were included in the day's schedule, including a weekend day or holiday if Contractor has scheduled construction activity that day.

§ 1.1.13.6 Net Days: Actual Adverse Weather Days experienced to date less Anticipated Adverse Weather Days anticipated to date. Actual Instruction Days experienced to date less Anticipated Instruction Days anticipated to date.



§ 1.1.13.7 Instruction Days: Regular Work Days when the Owner operations prevent progress on Critical Path portions of the Work. The Contractor will be entitled to an extension of the Contract Time for the net additional time, if any, which results from deducting the amount of Anticipated Instruction Days from the total amount of approved Instruction Days.

§ 1.1.13.8 The term “business day” is a day the Owner’s Administration Building is scheduled to be open for normal business purposes, unless closed by the Owner’s Superintendent of Schools or designee for inclement weather or other reason. Days on which the Administration Building is normally closed are Thanksgiving Break, Winter Break, Spring Break, and Summer Break, as well as other federal, state or local days specified in the calendar approved by the Owner’s Board of Trustees on an annual basis. A business day does not include a day on which the Owner’s Administration Building is open only for the purposes of conducting candidate filing, early voting, elections, or other special events.

§ 1.1.13.9 The term “Direct Labor Cost” means the actual and verifiable salaries and wages (basic, premium and incentive) paid to personnel, but does not include indirect payroll related costs or fringe benefits (Labor Cost Burden).

§ 1.1.13.10 The term “Labor Cost Burden” means the actual and verifiable cost of customary and statutory benefits including, but not limited to, social security contributions, unemployment, excise and payroll taxes, workers’ compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. Labor Cost Burden excludes all forms of general liability policy premiums and deductibles, safety training, tuition cost reimbursement, small tool expense, and union dues. The Owner reserves the right to request evidence of Labor Cost Burden at any time from Contractor and Subcontractors.

§ 1.1.14 The term “Compensable Change” means circumstances involving the performance of Extra Work:

- 1 that are the result of
  - (1) Differing Site Conditions,
  - (2) amendments or additions to Applicable Laws, which amendments or additions are enacted after the execution of the Agreement,
  - (3) a Change requested by Owner in accordance with the conditions of authorization applicable to Compensable Changes set forth in Article 7, below, or
  - (4) other circumstances involving a Change in the Work for which Contractor is given under the Contract Documents a specific and express right to a Change Order to the Contract Price;
- 2 that are not caused, in whole or in part, by an act or omission of Contractor or a Subcontractor, of any Tier, constituting negligence, willful misconduct, or violation of an Applicable Law, or by a failure of Contractor or a Subcontractor, of any Tier, to comply with the Contract Documents;
- .3 for which a Change Order is neither prohibited by nor waived under the terms of the Contract Documents; and
- .4 that if performed would require Contractor to incur additional and unforeseeable Allowable Costs that would not have been required to be incurred in the absence of such circumstances.

§ 1.1.15 The term “Compensable Delay” means a Delay to the critical path of activities affecting Contractor’s ability to achieve Substantial Completion of the entirety of the Work within the Contract Time:

- 1 that is the result of
  - (a) a Compensable Change,
  - (b) the active negligence of Owner, Architect, a Owner Consultant or a Separate Contractor,
  - (c) a breach by Owner of an obligation under the Contract Documents, or
  - (d) other circumstances involving Delay for which Contractor is given under the Contract Documents a specific and express right to a Change Order adjusting the Contract Price;
- 2 that is not caused, in whole or in part, by an act or omission of Contractor or a Subcontractor, of any Tier, constituting negligence, willful misconduct, or a violation of an Applicable Law, or a failure by Contractor or any Subcontractor, of any Tier, to comply with the Contract Documents; and
- 3 for which a Change Order to the Contract Time is neither prohibited by nor waived under the terms of the Contract Documents.

**§ 1.1.16** The term “Excusable Delay” means a Delay, other than a Compensable Delay, to Contractor’s ability to achieve Substantial Completion or Final Completion of the Work within the Contract Time that is: (1) not caused, in whole or in part, by an act or omission of Contractor or a Subcontractor, of any Tier, constituting negligence, willful misconduct, a violation of an Applicable Law or a failure by Contractor or any Subcontractor, of any Tier, to comply with the Contract Documents; (2) unforeseeable, unavoidable and beyond the control of Contractor and the Subcontractors, of every Tier; and (3) the result of a Force Majeure Event. Without limitation to the foregoing, neither the bankruptcy, insolvency nor financial inability of Contractor or a Subcontractor, of any Tier, nor any failure by a Subcontractor, of any Tier, to perform any obligation imposed by contract or Applicable Laws shall constitute a ground for Excusable Delay.

**§ 1.1.17** The term “Unexcused Delay” means any Delay that is not a Compensable Delay or Excusable Delay or that constitutes a Compensable Delay or Excusable Delay for which Contractor is not entitled to a Change Order to the Contract Time, including, without limitation, the following: (1) Delay caused by an act or omission of Contractor or a Subcontractor, of any Tier, constituting negligence, willful misconduct, a violation of an Applicable Law or a failure by Contractor or any Subcontractor, of any Tier, to comply with the Contract Documents; (2) Delay for which Contractor has failed to provide a timely and complete Notice of Delay or Request for Extension; or (3) Delay associated with any circumstances where the costs or risk associated with such circumstances are designated in the Contract Documents as being at Contractor’s risk or Contractor’s Own Expense.

## **§ 1.2 Correlation and Intent of the Contract Documents**

**§ 1.2.1** The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

**§ 1.2.1.1** The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties’ intentions and purposes in executing the Contract.

**§ 1.2.1.2** During the course of the Work, should any conflict be found in or between the Contract Documents, the Contractor shall be deemed to have estimated the Work on the basis of the greater quantity or better quality, or the most stringent requirement, unless the Contractor obtained a decision in writing from the Architect as to what shall govern before the submission of the Contractor’s proposal. The Architect, in case of such conflict, may interpret or construe the documents so as to obtain the most substantial and complete performance of the Work consistent with the Contract Documents and reasonably inferable therefrom, in the best interest of Owner, and the Architect’s decision shall be final. The terms and conditions of this clause shall not relieve any party of any other obligation under the Contract Documents.

**§ 1.2.2** Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

**§ 1.2.3** Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

## **§ 1.2.4 Relation of Specifications and Drawings**

General Requirements in the Specifications govern the execution of all Specifications. Summary paragraphs present a brief indication of the Work, but do not limit the Work as later detailed. The Drawings and Specifications are correlative and have equal authority and priority. Should the Drawings and Specifications have internal inconsistencies, then the Contractor shall base the bids and construction on the most expensive combination of quality and quantity of Work indicated. If Drawings and Specifications are not in concurrence regarding quantity or quality, Contractor shall request interpretation from the Architect. For purposes of construction, the Architect shall determine in writing the appropriate Work, after the Contractor brings the inconsistency to the Architect’s attention.



Failure to report an inconsistency shall be evidence that Contractor has elected to proceed in the more expensive manner.

**§ 1.2.4.1** Drawings are in part diagrammatic, and do not necessarily show complete details of construction, materials, or their performance, or installation, and do not necessarily show how construction details or other items of work or fixtures or equipment may affect any particular installation. These shall be ascertained by the Contractor from the Architect and correlated to bring the parts together to a complete whole.

**§ 1.2.4.2** All dimensions shall be verified by field measurements and all work laid out to permit pipes, valves, ductwork, lights, panels, other items of construction, to be located as closely as possible to locations shown. All items shall be checked before installation to determine that they can be concealed properly, if appropriate, and that they clear any structural components, supports for other items, and cabinets and equipment or other mechanical, electrical or architectural items having fixed locations.

**§ 1.2.4.3** Work shall be laid out to assure ready accessibility to valves, fittings, and other items requiring servicing, adjustment or checking.

**§ 1.2.4.4** Actual physical dimensions of specified stock items shall govern over dimensions shown for work to receive stock items. Custom items or modified stock items shall be fabricated to dimensions shown, or to fit into other dimensioned work.

**§ 1.2.4.5** If Work is required in a manner which makes it impossible to produce the specified quality of Work, or should errors, omissions, or discrepancies exist in the Contract Documents, the Contractor shall request in writing an interpretation before proceeding with Work. If Contractor fails to make such a written request, no excuse or claim will thereafter be entertained for failure to carry out Work in a satisfactory manner as specified by Contract Documents. Should conflict occur in or between Drawings and Specifications which should reasonably have been ascertained by the Contractor, Contractor is deemed to have estimated and included in the Contract Sum the more expensive way of doing the Work.

## **§ 1.2.5 Materials, Equipment and Processes**

The mechanical, electrical, and plumbing drawings show the general arrangement and extent of the Work. Exact location and arrangement of the various parts shall be determined with the approval of the Architect after equipment has been selected and as the Work progresses.

**§ 1.2.5.1** All Work shall, insofar as possible, be installed in such a manner as will not interfere with architectural or structural portions of the building. Should changes become necessary because of a failure of the Contractor to comply with the bidding instructions concerning equipment requiring area not shown on the Construction Documents, the Contractor shall be fully responsible for completing any required modifications or eliminating any interferences. The Contractor shall be required to submit material data and drawings on all equipment, which may vary from the Drawings and Project Manual, and any interferences must be eliminated before Work proceeds.

**§ 1.2.5.2** Where in the Project Manual, Specifications, and Drawings, certain products, manufacturer's trade names, or catalog numbers are given, it is done for the express purpose of establishing a standard of function, dimension, appearance, and quality of design, in harmony with the Work, and is not intended for the purpose of limiting competition. Where particular items are specified, products of those named manufacturers are required unless Contractor submits for consideration proposed substitutions of materials, equipment or processes from those set out in the Contract Documents. Submittals of proposed substitutions should contain sufficient information to allow the Architect and Owner to determine if the proposed substitution is in fact equal to or better than the requirements in the Contract Documents. Contractor shall bear all risk caused by submitting substitutions, including all costs. The Owner may approve substitutions only when the substitution is clearly provided by the Contract to be equal in performance characteristics to the requirements of the Contract Documents, equally compatible with the existing installations, and complementary to the architectural design for the Work. Certain specified construction and equipment details may not be regularly included as part of the named manufacturer's standard catalog equipment but shall be obtained by the Contractor from the manufacturer as required for the proper evaluation and/or functioning of the equipment. Reasonable minor variations in equipment are expected and will be acceptable, if approved in advance by the Architect and Owner; however, indicated and specified performance and material requirements are the minimum. The Owner and the Architect reserve the right to determine the equality of equipment and materials

that deviate from any of the indicated and specified requirements. Materials or equipment shall not be substituted unless the Architect has specifically accepted such substitution for use on this Project in writing.

**§ 1.2.5.3** Diagrammatic indications of piping, ducts, conduit, and other similar items are subject to adjustment to obtain required grading, passage over, under or around obstructions, to avoid exposure to finished areas, or unsightly, obstructing conditions. Contractor shall be responsible for coordination of these adjustments and recommending alternate solutions whenever design details affect construction feasibility, costs, or schedules. All manufactured articles, materials, and equipment shall be incorporated into the Work in accordance with the manufacturer's written or printed directions and instructions unless otherwise indicated in the Contract Documents.

#### **§ 1.2.6 Standards and Requirements**

When the Work is governed by reference to standards, building codes, manufacturers' instructions, or other documents, unless otherwise specified, the current edition as of the date of execution of the Agreement shall apply. Requirements of public authorities apply as minimum requirements only and do not supersede more stringent specified requirements.

#### **§ 1.2.7 Errors in Construction Documents**

The Owner and Contractor agree that the Contract Documents may not be free from errors, inconsistencies, or omissions. The Contractor stipulates and agrees that the Owner has no duty to discover any errors, inconsistencies, or omissions in the Drawings, Plans, Specifications and other Construction Documents, and has no duty to notify Contractor of same. Owner makes no warranty as to the completeness, adequacy, and accuracy of any Drawings, Plans, Specifications or other Construction Documents, either express or implied. Execution of the Contract by the Contractor is a representation that the Contractor has thoroughly reviewed and become familiar with the Contract Documents and that the Contractor is not aware of any errors, inconsistencies, or omissions in the Contract Documents which would delay the Contractor in the performance of the Contract Work. The Contractor shall not be entitled to any damages or increase in the Contract Sum due to delays or disruptions to the Work.

#### **§ 1.3 Capitalization**

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

#### **§ 1.4 Interpretation**

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

#### **§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service**

**§ 1.5.1** All ownership rights, whether common law, statutory, or other reserved rights, including copyright ownership, of the Instruments of Service/Construction Documents, are controlled by the Agreement between the Owner and the Architect. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service or Construction Documents. The Owner holds perpetual right to use all of the Instruments of Service / Construction Documents for this Project. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of any reserved rights.

**§ 1.5.2** The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the copyright holder. All copies of the Instruments of Service and Construction Documents, except the Contractor's record set, shall be returned or suitably accounted for to the copyright holder upon completion of the Work.

#### **§ 1.6 Notice**

**§ 1.6.1** Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to

whom the notice is addressed and shall be deemed to have been duly served if delivered to the individual for which it was intended in person, by registered or certified mail, return receipt requested, by courier service providing proof of delivery, or by electronic transmission (facsimile or email), with electronic confirmation of receipt, if a method for electronic transmission is set forth in the Agreement. For notices delivered by electronic transmission and received after 5:00 p.m. on a day on which the recipient's offices are open, or on a weekend, Holiday, or other day on which the recipient's offices are closed, notice shall be deemed to have been duly served on the next day on which the recipient's offices are open.

**§ 1.6.2** Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, return receipt requested, or by courier providing proof of delivery.

### **§ 1.7 Digital Data Use and Transmission**

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form, including, in the Owner's sole discretion, using AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data. Notwithstanding any provision herein to the contrary, if the parties agree to an exchange of electronic data/CAD files, such transfer shall be in accordance with the following requirements: the seals and signatures shall be removed from any Drawings or Project Manual and the following statement substituted: The record copy of this Drawing or Project Manual is on file at the Architect's office. This electronic document is released for the purposes of reference, coordination and/or facility management under the authority of Texas Registration Number Architect License No. (insert License #). Any modification of this Drawing or Project Manual shall be in compliance with the Texas Board of Architectural Examiner's rules.

### **§ 1.8 Building Information Models Use and Reliance**

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in Section 1.7, above, or any use of Contract Documents or any other information or documentation in digital form inconsistent with those protocols set forth in Section 1.7, above, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

### **§ 1.9 Parties to Consult**

**§ 1.9.1** Representatives of the Owner, Contractor, and Architect shall meet periodically at mutually agreed upon intervals for the purpose of establishing procedures to facilitate cooperation, communication and timely responses among the participants. By participating in this arrangement, the parties do not intend to create additional contractual obligations or modify the legal relationships which may otherwise exist.

**§ 1.9.2** Contractor acknowledges that the Contract Sum reflects Owner's absolute budgetary limit for the Costs of the Work. Should the Contractor become aware of circumstances with respect to the Work that, if not addressed or remedied would lead to a cost overrun, it shall immediately notify Owner and Architect of the existence of such circumstances and its recommendation for addressing the circumstances, including any possible elimination or offset of the cost overrun. If at any time circumstances arise that might result in the Contract Sum being exceeded, the Owner, Contractor and Architect shall consult and revise the Drawings and Project Manual (including, but not limited to consideration of substitutions of materials) in such fashion as to cause the Work as revised to be accomplished for the Contract Sum; provided that no such revision shall result in a material diminishment of the square footage of the instructional facilities.

## **ARTICLE 2 OWNER**

### **§ 2.1 General**

**§ 2.1.1** The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. All parties understand that only the Board of Trustees acting as a body corporate has the authority to bind the Owner with respect to all matters requiring the Board's approval under current policy of the Board of Trustees, including, but not limited to, a Change Order or Construction Change Directive modifying the Contract Sum or an extension to the date of Substantial or Final Completion. The Board of Trustees may designate in writing one or more persons to represent the Owner and act on its behalf for such matters, as well as day-to-day operations under the Contract, in accordance with the current policy of the Board of Trustees; however, such representatives shall have the authority to bind the Owner only to the extent expressly authorized by

the Owner and shall have no implied authority. Neither Architect nor Contractor may rely upon the direction of an employee of Owner who has not been designated as set forth herein, and Owner shall not be responsible, financially or otherwise, for actions taken by the Architect or Contractor in reliance upon direction from unauthorized persons. Except as otherwise provided in Section 4.2.1, the Architect does not have the authority to bind the Owner with respect to matters requiring Owner's approval or authorization. The Owner has contracted with the Architect who will carry out the functions of administration of the Project and the initial arbiter of Claims as identified in Section 15.2.

**§ 2.1.2** The presence of the Owner, the Owner's representative(s) or Architect at the Work site does not imply acceptance or approval of the Work.

**§ 2.1.3** The Owner may require that the Contractor use and/or respond to certain Owner-furnished forms or inquiries during the course of the Project. From time to time, there may be future revisions, changes, additions or deletions to these forms. The fact that the Owner modifies and increases reasonable reporting requirements shall not serve as the basis for a claim for additional time or compensation by the Contractor.

**§ 2.2** Intentionally deleted.

**§ 2.2.4** Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

### **§ 2.3 Information and Services Required of the Owner**

**§ 2.3.1** Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities. Contractor shall pay for all permit fees and inspection fees required for performance of the Work other than inspection and testing fees which the Owner contracts for separately with a third party, and Certificates of Occupancy fees. All of such fees shall be considered Cost of the Work unless the Contractor is required to pay for them without reimbursement due to the Contractor's fault under other provisions of the Contract Documents.

**§ 2.3.2** The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

**§ 2.3.3** If the employment of the Architect terminates, the Owner shall employ a successor whose status under the Contract Documents shall be that of the Architect. Owner shall notify Contractor if a new Architect has been employed by Owner.

**§ 2.3.4** If requested in writing to do so by the Contractor prior to the start of the Work, the Owner may, at the Owner's sole discretion, furnish surveys known to the Owner describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. Owner does not guarantee the accuracy of surveys provided, including the locations of utility lines, cables, pipes, or pipelines, or the presence or absence of easements. The Contractor shall not be entitled to rely on the accuracy of information furnished by the Owner and shall exercise proper diligence and take appropriate precautions relating to the safe performance of the Work. THE OWNER DOES NOT IN ANY WAY REPRESENT, WARRANT OR GUARANTY TO CONTRACTOR OR TO ANY OTHER PERSON THE RELIABILITY, CONSTRUCTABILITY, COMPLETENESS, OR ACCURACY OF ANY SURVEYS, REPORTS, STUDIES, TESTS, ARCHITECTURAL OR ENGINEERING PLANS, OR SIMILAR INFORMATION PROVIDED BY OWNER IN CONNECTION WITH THIS CONTRACT, NOR DOES THE OWNER REPRESENT, WARRANT OR GUARANTY THAT SUCH INFORMATION IS FREE FROM DEFECTS, ERRORS OR DEFICIENCIES, AND ALL SUCH

REPRESENTATIONS, WARRANTIES AND GUARANTIES ARE HEREBY EXPRESSLY DENIED AND DISCLAIMED. The Owner shall not be liable to the Contractor or any other person for breach of warranty or misrepresentation in the event of any errors or deficiencies in such information provided to the Contractor by the Owner. The Owner's provision of a survey will not relieve the Contractor from its obligations to examine the site or exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 Information or services required of the Owner by the Contract Documents shall be furnished by the Owner within a reasonable time following actual receipt of a written request. Absent such timely request by Contractor, any Claim based upon lack of such information or services shall be waived. The Owner shall not be required to expend any funds to obtain such information unless Owner agrees to do so.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one .pdf copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2. The cost of reproductions will be borne by the Contractor.

#### § 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct non-conforming or defective Work as required by Section 12.2, or fails to complete the Work on time as required by the Contract or is in default of any of its material obligations hereunder, the Owner, by a written order signed by an agent specifically so empowered by the Owner, may order the Contractor to stop the Work or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to any duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity. This right shall be in addition to, and not in restriction of, the Owner's rights under Section 12.2.

#### § 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a three-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Owner or Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the actual cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's and other consultants' additional services and expenses made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner within thirty (30) days after receipt of written notice from the Owner therefor. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

### ARTICLE 3 CONTRACTOR

#### § 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative. If the Work is performed under a Construction Manager at Risk delivery method, the term "Contractor" shall include the Construction Manager or its authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents and in a good and workmanlike manner except to the extent the Contract Documents expressly specify a higher degree of finish or workmanship. Workmanship shall be of a quality to produce first class results. This shall mean that all material shall be installed in a true and straight alignment, level and plumb, patterns shall be uniform, and jointing of materials shall be flush and level unless otherwise directed in writing by the Architect. All labor shall be performed in the best manner by laborers, workers, and mechanics skilled in their respective trades.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, activities



of the Owner (or Owner's Program Manager, if applicable), or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

**§ 3.1.4** By submission of a proposal, the Contractor represents and warrants the following to the Owner (in addition to the other representations and warranties contained in the Contract Documents), as an inducement to the Owner to execute this Contract, which representations and warranties shall survive the execution and delivery of the Contract and the Final Completion of the Work: (1) that the Contractor is financially solvent, able to pay its debts as they mature, and possessed of sufficient working capital to complete the Work and perform its obligations under the Contract Documents; (2) that the Contractor is able to furnish the plant, tools, materials, supplies, equipment, and labor required to timely complete the Work and perform its obligations hereunder and that the Contractor is sufficiently experienced and competent to do so; (3) that the Contractor is authorized to do business in the State where the Project is located and properly licensed by all necessary governmental, public, and quasi- public authorities having jurisdiction over the Contractor, the Work, or the site of the Project; and (4) that the execution of the Contract and its performance thereof are within the Contractor's duly-authorized powers.

**§ 3.1.5** Pursuant to Texas Education Code Section 44.034, Contractor must give advance written notice to the Owner if the Contractor or an owner or operator of the Contractor has been convicted of a felony. The Owner may terminate the Contract if the Owner determines that the Contractor failed to give such notice or misrepresented the conduct resulting in the conviction. This paragraph requiring advance notice does not apply to a publicly-held corporation.

**§ 3.1.6** Contractor, its Subcontractors, Sub-subcontractors, suppliers, and other vendors shall bear responsibility for compliance with all applicable state and federal laws, regulations, guidelines, and ordinances applicable to the Work, including but not limited to, laws concerned with labor, equal employment opportunity, safety, minimum wages, and prevailing wage rates. Contractor further recognizes that the Owner and Architect do not owe the Contractor or any Subcontractor, Sub-subcontractor, supplier, or other vendor any duty to supervise or direct its work so as to protect such party from the consequences of its own conduct. Without limiting the foregoing, the Owner reserves the right to utilize one or more of its employees to function in the capacity of the Owner's inspector, whose primary function will be daily inspections, checking pay requests, construction timelines, and storage of supplies and materials.

**§ 3.1.7** The Contractor shall disclose the existence and extent of any financial interests, whether direct or indirect, such Contractor may have in any Subcontractor, Sub-subcontractor, supplier, and other vendor which the Contractor may propose for the Project.

**§ 3.1.8** It is understood and agreed that the relationship of Contractor to Owner shall be that of an independent contractor. Nothing contained the Contract or inferable therefrom shall be deemed or construed to: (1) make Contractor the agent, servant or employee of the Owner; or (2) create any partnership, joint venture, or other association between Owner and Contractor. Any direction or instruction by Owner in respect of the Work shall relate to the results the Owner desires to obtain from the Work and shall in no way affect Contractor's independent contractor status as described herein.

## **§ 3.2 Review of Contract Documents and Field Conditions by Contractor**

**§ 3.2.1** Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents. Contractor also represents by its execution of the Contract, that the Contractor has thoroughly reviewed all of the Contract Documents and that based on such review and to the best knowledge of Contractor as a contractor, not as a design professional, that said Contract Documents are sufficient to enable the Contractor to determine the Contract Sum and that the Contract Documents are sufficient to enable it to perform the Work described in the Contract Documents, and otherwise to fulfill all its obligations hereunder in accordance with the terms of the Contract. The Contractor further acknowledges and declares that it has visited and examined the site (but only as to visible surface conditions or conditions ascertainable from the results of any subsurface tests required or provided in connection with this Project, or other reports and documents available to the Contractor) and reasonably examined the physical, legal and other conditions affecting the Work including, without limitation, all soil, subsurface, water, survey and engineering reports and studies delivered to or obtained by Contractor and the conditions described in this Section 3.2.1. In connection therewith, Contractor, by execution of the Contract will be representing and warranting to Owner that it has, by careful examination, satisfied

itself as to the conditions and limitations under which the Work is to be performed, including, without limitation, (1) the location, layout and nature of the Project site and surrounding areas, (2) generally prevailing climatic and weather conditions, (3) anticipated labor supply and costs, (4) availability and cost of materials, tools and equipment and (5) other similar issues. In arriving at the Contract Sum, the Contractor has, as an experienced and prudent manager and contractor, exercised its reasonable judgment and expertise to include the impact of such circumstances upon the Contract Sum.

- .1 Claims for additional compensation or time because of the failure of the Contractor to familiarize itself with visible surface conditions at the site or other conditions under which the Work is to be performed will not be allowed.
- .2 The Owner assumes no responsibility or liability for the physical condition or safety of the Project site or any improvements located on the Project Site. The Contractor shall be solely responsible for providing a safe place for the performance of the Work. The Owner shall not be required to make any adjustment in the Contract Sum, Guaranteed Maximum Price, if applicable, or Contract Time in connection with any failure by the Contractor or any Subcontractor to comply with the requirements of this Section 3.2.
- .3 The Contractor represents that the Subcontractors, manufacturers and suppliers engaged or to be engaged by it are and will be familiar with the requirements for performance by them of their obligations. All contracts with subcontractors and suppliers shall be in writing, and shall reflect the terms of this Contract which directly or indirectly affect subcontractors or suppliers, including Owner's right to withhold payment, retainage requirements, and Owner's rights and liability on termination of this Contract. The Contractor shall require compliance with the terms and provisions of the Contract Documents applicable to them, including, without limitation, the requirement for subcontractors to comply with the prevailing wage rates established in the Contract, to maintain worker's compensation coverage on employees, and to provide certification of such coverage to Contractor.
- .4 This project has been planned around a master planned campus with three (3) public roads bisecting from different directions. There are also infrastructure projects and other school construction projects all of which will be in varying stages of completion while this project begins. It is incumbent upon the Contractor to work with other Owner Contractors performing work along shared corridors. Should a dispute arise between two Contractor's, the Contractor shall notify the Owner who will mediate the dispute in a method which best resolves the overall Program schedule and work being performed on this campus.

**§ 3.2.2** Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor. In addition, as part of the Contractor's preconstruction services, in reviewing the Contract Documents, the Contractor shall endeavor to detect any errors, omissions, or inconsistencies in the design and other documents which affect the performance or constructability of the Work. The Contractor shall promptly report to the Architect and the Owner any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents. The Contractor shall make a reasonable attempt to interpret the Contract Documents before asking the Architect for assistance in interpretation or initiating a Request for Information (RFI). The Contractor shall not ask the Architect for observation of Work prior to the Contractor's field superintendent's personal inspection of the Work. If, in the opinion of the Architect or the Owner, the Contractor does not make a reasonable effort to comply with the above requirements or such information was available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, Owner-provided information, Contractor-prepared coordination drawings, or prior Project correspondence or documentation, and this causes the Architect or its Consultants to expend additional time in the discharge of the duties imposed by the Contract Documents, then the Contractor shall bear the cost of compensation for the Architect's and its consultants' additional services and

expenses made necessary by the Contractor's failure and the Owner shall be entitled to deduct such amounts from the Contract Sum. The Architect will give the Contractor prior notice of intent to bill for additional services and expenses before additional services are performed or additional expenses are incurred.

- .1 The exactness of grades, elevations, dimensions, or locations given on any Drawings issued by the Architect, or the work installed by other contractors, is not guaranteed by the Owner. The Contractor shall, therefore, satisfy itself as to the accuracy of all grades, elevations, dimensions, and locations. In all cases of interconnection of its Work with existing or other work, it shall verify at the site all dimensions relating to such existing or other work. Any errors due to the Contractor's failure to so verify all such grades, elevations, dimensions, or locations shall be promptly rectified by the Contractor without any additional cost to the Owner.

**§ 3.2.3** The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect and the Owner any nonconformity in the Contract Documents with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities that is discovered by or made known to the Contractor as a request for information in such form as the Architect or Owner may require. The Owner is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities.

**§ 3.2.4** If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall notify the Owner prior to incurring such additional cost or expending such additional time, or if Contractor cannot reasonably provide notice prior to incurring costs or expending additional time, then as soon thereafter as reasonably possible, but not later than 10 Calendar Days, and may submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations including any extra efforts as required to bring the project back into alignment with the original schedule. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and limitations of the Contractor's ability to satisfactorily perform the Work or to honor an applicable warranty, and limitations of or interference with the Owner's intended use, caused by products or systems specified except when: (1) such errors, inconsistencies, omissions, differences, nonconformities, or limitations are the fault of Contractor, in whole or in part, (2) the Contractor failed to discover such errors, inconsistencies, omissions, differences, or nonconformities due to its failure to properly perform the obligations of Section 3.2.2 or 3.2.3, (3) the Contractor recognized such errors, inconsistencies, omissions, differences, nonconformities, or limitations and failed to report them to the Architect and the Owner, or (4) the Contractor should have detected such errors, inconsistencies, omissions, differences, nonconformities, or limitations as part of Contractor's performance of its obligations under the Contract Documents, including the performance of Contractor's preconstruction services.

**§ 3.2.5** Notwithstanding the delivery of a survey or other documents by the Owner, prior to performing any Work, Contractor shall, if applicable, independently determine the location of all utility lines as shown and located on the plans and specifications, including telephone company lines and cables, sewer lines, water pipes, gas lines, electrical lines, including, but not limited to, all buried pipelines and buried telephone cables, and shall perform the Work in such a manner so as to avoid damaging any such lines, cables, pipes, and pipelines. Contractor shall be responsible for any damage done to such utility lines, cables, pipes and pipelines during its Work, and shall be responsible for any loss, damage, or extra expense resulting from such damage. Repairs shall be made immediately to restore all service. Any delay for such break shall be attributable to Contractor. In addition, Contractor shall, if applicable, review the appropriate AHERA and hazardous materials surveys for the particular site(s) involved in the Project, and shall notify all Subcontractors and Sub-subcontractors of the necessity to review said surveys. Contractor shall perform the Work in such a manner as to avoid damaging, exposing, or dislodging any asbestos-containing materials that are clearly identified and located in AHERA and other hazardous material surveys. Before performing any portion of the Work, the Contractor shall fully investigate all physical aspects of the Project site and verify all dimensions, measurements, property lines, grades and elevations, existing improvements, and general suitability of existing conditions at the Project site. If applicable, Contractor shall comply with U.S. Environmental Protection



Agency rules concerning renovating, repairing or painting work in schools built prior to 1978 involving lead-based paint.

**§ 3.2.6** If the Contractor has knowledge that any of the products or systems specified will perform in a manner that will limit the Contractor's ability to satisfactorily perform the Work or to honor an applicable warranty, or will result in a limitation of or interference with the Owner's intended use, then the Contractor shall promptly notify the Architect and Owner in writing, providing substantiation for its position.

**§ 3.2.7** The Contractor shall arrange meetings prior to commencement of the Work of all major Subcontractors to allow the Subcontractors to demonstrate an understanding of the Contract Documents to the Architect and to allow the Subcontractors to ask for interpretations, when necessary. The Contractor and each Subcontractor shall evaluate and satisfy themselves as to the conditions and limitations under which the Work is to be performed, including: (1) The location, condition, layout, drainage and nature of the Project site and surrounding areas; (2) Generally prevailing climatic conditions; (3) Anticipated labor supply and costs; (4) Availability and cost of materials, tools and equipment; and (5) Other similar issues.

### **§ 3.3 Supervision and Construction Procedures**

**§ 3.3.1** The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. Contractor shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed without acceptance of changes proposed by the Contractor, the Contractor shall not be responsible for any resulting loss or damage to the extent that the acceptance of Contractor's proposed alternative means, methods, techniques, sequences, or procedures would have avoided such loss or damage.

**§ 3.3.2** The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

**§ 3.3.2.1** Contractor shall, before any duties are performed on Owner's property where students are present, and at least annually thereafter, comply with all requirements relating to criminal history information required by Texas Education Code Chapter 22, unless Owner, in its sole discretion, determines in writing that an exception applies under Section 22.08341(c) of the Texas Education Code, subject to Contractor's and all Subcontractors' compliance with Section 22.08341(i) of the Texas Education Code. Before beginning any Work on the Project, Contractor will provide written certification and all information required by Owner to the Owner that Contractor has complied with the statutory requirements as of that date. The form of certification by the Contractor shall be supplied by the Owner and must be supplemented by the Contractor as required by law, or as requested by Owner. Upon request by Owner, Contractor will provide, in writing, updated certifications and the names and any other requested information regarding individuals to whom Chapter 22 applies, so that the Owner may obtain criminal history record information on such individuals. Contractor shall assume all expenses associated with obtaining criminal history record information. It shall be the responsibility of the Contractor and the entities with which the Contractor contracts to ensure compliance with this provision.

**§ 3.3.2.1.1** Subcontractors or any Subcontractor entity, as defined by Texas Education Code Chapter 22, shall be required by the terms of their contract with Contractor or any other contracting entity (as defined in Texas Education Code Chapter 22), and by Texas law, to comply with all requirements relating to criminal history record information on their employees, agents, or applicants, to give required certifications and provide all information requested by Owner to Owner and the contracting entities, and to obtain required certifications/compliance from the subcontracting entity's subcontractors.

**§ 3.3.2.1.2** Contractor will not assign any “covered employees” with a “disqualifying criminal history”, as those terms are defined below, to work on the Project. If Contractor receives information that a covered employee has a reported disqualifying criminal history, then Contractor will immediately remove the covered employee from the Project and notify the Owner in writing within three (3) business days. If Owner, in its sole discretion, objects to the assignment of a covered employee for any reason, including, but not limited to, on the basis of the covered employee’s criminal history record information and/or insufficient qualifications, lack of experience, and the like, based on information gathered by Owner through the procurement and/or contracting processes, Contractor/Subcontractor agrees to discontinue using that covered employee to provide services on Owner’s Project. If Contractor has taken precautions or imposed conditions to ensure that the employees of Contractor or any Subcontractor will not become covered employees, Contractor will ensure that these precautions or conditions continue throughout the time the contracted services are provided.

**§ 3.3.2.1.3** For the purposes of this Section 3.3.2.1, “covered employees” means employees, agents or Subcontractors of Contractor or a Subcontractor who has or will have continuing duties related to the services to be performed on Owner’s Project and has or will have direct contact with Owner’s students. “Disqualifying criminal history” means: (1) For employees of a contracting or subcontracting entity that is providing engineering, architectural, or construction services on a project to design, construct, alter, or repair a public work: (1) a conviction or other criminal history information designated by Owner; (2) a felony or misdemeanor offense that would prevent a person from being employed under Texas Education Code § 22.08341(d), that is: conviction during the preceding 30 years (if at the time of the offense, the victim was under 18 or was enrolled in a public school) of: (a) a felony offense under Title 5, Texas Penal Code; (b) an offense on conviction of which a defendant is required to register as a sex offender under Chapter 62, Texas Code of Criminal Procedure; or (c) an offense under federal law or the laws of another state that is equivalent to (a) or (b); (2) For employees of all other contracting or subcontracting entities: (1) a conviction or other criminal history information designated by Owner; (2) a felony or misdemeanor offense that would prevent a person from being employed under Texas Education Code § 22.085(a), that is: (a) conviction of a felony offense under Title 5, Texas Penal Code if at the time of the offense, the victim was under 18; (b) conviction of or placement on deferred adjudication community supervision for an offense for which a defendant is required to register as a sex offender under Chapter 62, Texas Code of Criminal Procedure; or (c) conviction of an offense under federal law or the laws of another state that is equivalent to (a) or (b).. Owner shall be solely responsible for making the final determination of what constitutes direct contact with Owner’s students and what constitutes a disqualifying criminal history.

**§ 3.3.2.2** Contractor shall enforce the Owner’s alcohol-free, drug-free, tobacco-free, harassment-free and weapon-free policies and zones, which will require compliance with those policies and zones by Contractor’s employees, Subcontractors, and all other persons carrying out the Contract. Contractor shall require all construction workers, whether Contractor’s own forces or the forces of Contractor’s Subcontractors, while on Owner’s property, to refrain from committing any criminal conduct, using tobacco products, possessing or drinking alcoholic beverages, possessing or using illegal drugs or any controlled substance, carrying or possessing weapons, speaking profane and/or offensive language, or engaging in any inappropriate interactions of any nature whatsoever with Owner’s students or employees, including talking, touching, staring or otherwise contributing to a hostile or offensive environment for Owner’s students or employees. The Contractor shall further ensure that no on-site fraternization shall occur between personnel under the Contractor’s and Subcontractor’s direct or indirect supervision and Owner’s students or employees or the general public. Sexual harassment is strictly forbidden. Any employee of the Contractor or a Subcontractor who is found to have engaged in any such conduct shall be subject to appropriate disciplinary action by the Contractor or Subcontractor, including immediate removal from the job site.

**§ 3.3.2.3** All areas of campus, other than the defined construction area, shall be off limits to Contractor’s forces, unless their work assignment specifies otherwise. Contractor shall also require adequate and appropriate dress, including wearing shirts at all times, and “badging” of Contractor’s employees, Subcontractors, and all other persons carrying out the Work on the job site for identification. Contractor shall ensure that all construction workers, whether Contractor’s own forces or the forces of Contractor’s Subcontractors, wear identification tags on the front of their persons during all times that they are on Owner’s property. Such identification tags shall contain a current photograph and the worker’s name in a typeface large enough to be seen from a reasonable distance. Contractor shall furnish to Owner (and update, as appropriate) photo identification of all workers and employees.

**§ 3.3.2.4** Contractor shall require all construction workers, whether Contractor’s own forces or the forces of Contractor’s Subcontractors, to park their personal motor vehicles on Owner’s property only in the parking places

designated by the Owner's campus principal or other facility administrator. Any vehicles not parked in the appropriate locations shall be towed at the vehicle owner's sole expense.

**§ 3.3.2.5** Contractor shall follow, and shall require all employees, agents and subcontractors to follow, the tree ordinance of the municipality in which the Project is located. In addition, if not covered by the municipal tree ordinance, Contractor shall barricade and protect all trees on the Project, which shall be included in the Cost of the Work.

**§ 3.3.2.6** Contractor shall institute a theft deterrence program designed to restrict construction worker access to properties of Owner that are currently in use, to maintain supervision of Contractor's and Contractor's Subcontractor's forces, and to reimburse the Owner or those persons suffering a theft loss which results from Contractor's forces or Contractor's Subcontractor's forces' actions, omissions, or failure to secure the Work or connecting or adjacent property.

**§ 3.3.2.7** Any individual found by Owner to have violated the standards of conduct or restrictions set forth in Section 3.3.2 is subject to immediate removal from the job site and, in Owner's sole discretion, permanent removal from the Project or all construction on any of Owner's property. Repeated removal of Contractor's or Contractor's Subcontractor's forces, or one serious infraction, shall constitute a material breach of the Contract justifying the immediate termination by Owner pursuant to Article 14. THE CONTRACTOR HEREBY RELEASES, INDEMNIFIES AND HOLDS HARMLESS THE OWNER FROM AND AGAINST CONTRACTOR'S AND ANY SUBCONTRACTOR'S FORCES' NON-COMPLIANCE WITH THE STANDARDS OF CONDUCT OR RESTRICTIONS SET FORTH IN SECTION 3.3.2, NON-COMPLIANCE WITH CRIMINAL LAW, AND NON-COMPLIANCE WITH IMMIGRATION LAW OR REGULATIONS. Contractor shall place similar language in its subcontract agreements, requiring its Subcontractors and Sub-subcontractors to be responsible for their own forces, and Contractor shall cooperate with the Owner to ensure Subcontractor and Sub-subcontractor compliance.

**§ 3.3.3** The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work. Copies of inspection reports, photographs or other related records shall be made available to the Owner for review if requested. Reports and documentation shall be formatted and developed in a logical format indicating dates, time of day, findings and the person performing the inspection.

**§ 3.3.4** The Contractor shall review Subcontractor safety programs, procedures, and precautions in connection with performance of the Work. However, the Contractor's duties shall not relieve any Subcontractor(s) or any other person or entity (e.g., a supplier), including any person or entity with whom the Contractor does not have a contractual relationship, of their responsibility or liability relative to compliance with all applicable federal, state, and local laws, rules, regulations, and ordinances which shall include the obligation to provide for the safety of their employees, persons, and property and the requirements to maintain a work environment free of recognized hazards. The foregoing notwithstanding, the requirements of this Section are not intended to impose upon the Contractor any additional obligations that the Contractor would not have under any applicable state or federal laws, including, but not limited to, any rules, regulations, or statutes pertaining to the Occupational Safety and Health Administration.

**§ 3.3.5** The Contractor has the responsibility to ensure that all materials suppliers and Subcontractors, Sub-subcontractors, suppliers, and their agents, and employees adhere to the Contract Documents, and that they order materials on time, taking into account the current market and delivery conditions and that they provide materials on time. The Contractor shall properly and efficiently coordinate the timing, scheduling, and routing of its Work with that of all trades, Subcontractors, and others on the Project including deliveries, storage, installations and construction utilities. The Contractor shall be responsible for the space requirements, locations, and routing of all materials and equipment required under the Agreement or other Contract Documents. In areas and locations where the proper and most effective space requirements, locations, and routing cannot be made as indicated, the Contractor shall meet with all others involved, before installation, to plan the most effective and efficient method of overall installation.

**§ 3.3.6** Contractor acknowledges that the Work may be performed in connection with a facility which may be currently occupied and in use. It is imperative that Contractor's operations and the performance of the Work not interfere with, interrupt, disturb, or disrupt Owner's normal operations or facilities. Contractor agrees to and shall comply with all rules, regulations and requirements of the Owner and the facility on which the Work is to be

performed, and shall take all steps necessary to protect and guard the safety of the employees, students and invitees of Owner. Contractor shall exercise the utmost skill and judgment to ensure that continuing construction activity will not interfere with the use, occupancy and quiet enjoyment of facilities in use on the site. Contractor recognizes that the ongoing activities in proximity with its construction activities shall result in the need for prompt and effective coordination of its services with those involved in the ongoing utilization of the premises. Such coordination and adequate site access shall be the responsibility of Contractor. When Work occurs in existing facilities, Contractor understands and accepts the cost and schedule impacts associated with work in existing facilities and the potential delays and disruptions to the progress of the Work and has considered such delays and disruptions in the Contract Sum. The Contractor shall perform all the Work in such a manner as to cause minimum interference with the operations of the Owner and other Contractors and Subcontractors on the site, and shall take, and cause the Contractor's and its Subcontractor's employees, agents, licensees and permittees to take all necessary precautions to protect the Work and the site and all persons and property thereon from damage or injury. Contractor shall not request access to the Project, or request the presence of the Owner or presence of Owner's Consultants during non-working times unless the Contractor has demonstrated full-time, fully staffed performance of the Work during Regular Work Days. Owner shall not be obligated to comply with properly submitted requests.

**§ 3.3.7** Representatives of the Owner, Contractor, and Architect shall meet periodically at mutually agreed upon intervals, for the purpose of establishing procedures to facilitate cooperation, communication, and timely responses among the participants. By participating in this arrangement, the parties do not intend to create additional contractual obligations or modify the legal relationships which may otherwise exist.

**§ 3.3.8** The Owner may require that the Contractor use and/or respond to certain Owner-furnished forms or inquiries during the course of the Project. From time to time, there may be future revisions, changes, additions or deletions to these forms. The fact that the Owner modifies and increases reasonable reporting requirements shall not serve as the basis for a claim for additional time or compensation by the Contractor.

**§ 3.3.9** In the event Contractor shall fall behind schedule at any time, for any reason, Owner shall be entitled to direct acceleration or resequencing of the Work to bring the Work back on schedule. Contractor shall be entitled to compensation for such acceleration only (a) to the extent necessitated by excusable and compensable delays, and (b) to the extent of premium pay and additional equipment cost actually incurred by Contractor. In the event Contractor determines that the Scheduled Completion Date cannot be met by resequencing the Work, then Contractor shall immediately provide to the Owner, and in any event within seven (7) days after the date of receipt of any request by Owner for resequencing or acceleration, a plan to complete the Work in the shortest possible time. No approval by the Owner of any plan for resequencing or acceleration of the Work submitted by Contractor pursuant to this paragraph shall constitute a waiver by Owner of any damages or losses which Owner may suffer by reason of such resequencing or the failure of Contractor to meet the Scheduled Completion Date.

#### **§ 3.4 Labor and Materials**

**§ 3.4.1** Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

**§ 3.4.1.1** The Contractor and any Subcontractor or Sub-subcontractor on the Project shall properly classify, as an employee or an independent contractor, in accordance with the Fair Labor Standards Act, its implementing regulations, and Texas Labor Code Section 214.008, any individual the Contractor, Subcontractor, or Sub-subcontractor directly retains and compensates for services performed in connection with the Contract. Any Contractor, Subcontractor, or Sub-subcontractor who fails to properly classify such an individual may be subject to the penalties of Texas Labor Code Sec. 214.008(c).

**§ 3.4.1.2** Attention is called to the Government Code, Chapter 2258, Prevailing Wage Rates. Among other things, this Article provides that it shall be mandatory upon the Contractor, and upon any Subcontractor and Sub-Subcontractor under the Contractor, to pay all laborers, workers, and mechanics employed or utilized by them in the execution of the Contract not less than the prevailing rates of per diem wages for work of a similar character in the locality at the time of construction.



**§ 3.4.1.3** In accordance therewith Texas Government Code Section 2258 et seq.; Texas Labor Code Section 62.051 et seq, the Owner has established a scale of prevailing wages which is incorporated in the Contract Documents, and not less than this established scale must be paid on the Project. Any workers not included in the schedule shall be properly classified and paid not less than the rate of wages prevailing in the locality of the Work at the time of construction. Wages listed are minimum rates only, and payment greater than the prevailing wage is not prohibited. No claims for additional compensation above the Contract Sum shall be considered by the Owner because of payments of wage rates in excess of the applicable rates provided herein. If no schedule of prevailing wage rates is included in the Contract Documents, then the parties shall, at a minimum, use the wage rates determined by the U.S. Department of Labor for projects located in the County in which the Project is located in accordance with the Davis-Bacon Act, 40 USC3141-3148, which can be accessed on the internet at <https://sam.gov/content/wage-determinations>, or the wage rates determined by any local contractor association, whichever is higher..

**§ 3.4.1.4** The Contractor and each Subcontractor and Sub-Subcontractor shall keep a record showing the name and occupation of each worker employed by the Contractor, Subcontractor, or Sub-subcontractor in the construction of the Work and the actual per diem wages paid to each worker. Owner reserves the right to receive and review payroll records, payment records, and earning statements of employees of Contractor, and of Contractor's Subcontractors and Sub-subcontractors. These records shall be maintained and made accessible for no less than three (3) years following the date of Final Completion.

**§ 3.4.1.5** A Contractor or Subcontractor or Sub-Subcontractor who violates the requirements of Sections 3.4.1.2 or 3.4.1.3 shall pay to Owner the sum of Sixty Dollars and No/100 (\$60.00) for each laborer, worker, or mechanic employed for each calendar day or part of the day that the laborer, worker, or mechanic is paid less than the wage rate stipulated in the scale of prevailing wages applicable to the Project, as required by Texas Government Code Section 2258.023(b).

**§ 3.4.1.6** In the event of a complaint of a breach of the requirements in Sections 3.1.6 or 3.4.1, et seq, the Owner shall have the right to make a determination as provided by law, and to retain any amount due under the Contract pending a final determination of the violation. Owner may conduct, at its discretion, wage-related interviews of any worker at the sites of the Work without prior warning to the Contractor or Subcontractor or Sub-Subcontractor.

**§ 3.4.1.7** In the event of a strike or stoppage of Work resulting from a dispute involving or affecting the labor employed by the Contractor or any of its Subcontractors or Sub-subcontractors, Owner may, at its option and without any notice required by the Contract, terminate the Contract for default unless the Contractor remedies the strike of Work or Work stoppage or other disruption within twenty (20) calendar days after the dispute arises.

**§ 3.4.1.8** The Contractor shall require all Subcontractors and Sub-Subcontractors to comply with the provisions of this Section 3.4.1 and its subparts.

**§ 3.4.2** Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the prior written consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive. Any such substitution request shall be made to the Architect within fifteen (15) days after execution of the Contract.

- .1** Substitutions and alternates may be rejected without explanation and will be considered only under one or more of the following conditions: (i) the proposal is required for compliance with interpretation of code requirements or insurance regulations then existing; (ii) specified products are unavailable through no fault of the Contractor; (iii) and when, in the judgment of the Owner or the Architect, a substitution would be substantially in the Owner's best interests in terms of cost, time, or other considerations.
- .2** The Contractor must submit to the Architect and the Owner (i) a full explanation of the proposed substitution and submittal of all supporting data, including technical information, catalog cuts, warranties, test results, installation instructions, operating procedures, and other like information necessary for a complete evaluation for the substitution; (ii) a written explanation of the reasons the substitution is necessary, including the benefits to the Owner and the Work in the event the substitution is acceptable; (iii) the adjustment, if any, in the Contract Sum; (iv) the adjustment, if any, in the Contract Time and the construction schedule; and (v) an affidavit stating the (a) proposed

substitution conforms to and meets all requirements of the pertinent Specifications and the requirements shown on the Drawings, and (b) the Contractor accepts the warranty and correction obligations and will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be completed in all respects as if originally specified by the Architect. Proposals for substitutions shall be submitted in triplicate to the Architect and the Owner in sufficient time to allow the Architect and the Owner no less than twenty-one (21) Business Days for review, unless a shorter time is agreed upon in writing. No substitutions will be considered or allowed without the Contractor's submittals of complete substantiating data and information as stated herein.

- .3 Whether or not the Owner or the Architect accepts any proposed substitution, the Contractor shall reimburse the Owner for any fees charged by the Architect or other consultants for evaluating each proposed substitute.

**§ 3.4.3** The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly qualified by training and experience and skilled in tasks assigned to them. The Contractor shall only employ or use labor in connection with the Work capable of working harmoniously with all trades, crafts, and any other individuals associated with the Project. The Contractor shall furnish Owner, on request, resumes of the Contractor's key personnel involved in the day-to-day Work on the Project, as well as a list of all engineers, consultants, subcontractors and suppliers involved in construction. At the written request of the Owner or Architect, the Contractor shall not use in the performance of the Work any engineer, consultant, or employee of the Contractor, Subcontractor or Sub-subcontractor reasonably deemed by Owner to be incompetent, careless, unqualified to perform the Work assigned to him, insubordinate, in violation of any provision in the Contract Documents, or otherwise unsatisfactory to Owner. Contractor shall engage sufficient workers on the Project at all times for the proper coordination and performance of the Work in the time periods required by the Contract. This provision is applicable to Subcontractors, Sub-subcontractors and their employees.

**§ 3.4.4 Identification of Employees.** Contractor shall require all construction workers, whether Contractor's own forces, or the forces of Contractor's subcontractors, to wear identification tags on the front of their persons during all times that they are on Owner's property. Such identification tags shall have identification of the construction worker by number or other identifying medium in a typeface large enough to be seen from eight feet away if requested to do so.

### **§ 3.5 Warranty**

**§ 3.5.1** The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. The Contractor further warrants that the Work will be performed and completed in a good and workmanlike manner, continuously and diligently in accordance with the Contract Documents, all applicable building codes, and generally accepted standards of engineering and construction practice for construction of projects similar to the Project, except to the extent the Contract Documents expressly specify a higher degree of finish or workmanship, in which case the standard shall be the higher standard. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse by parties other than Contractor, alterations to the Work not executed by the Contractor, improper or insufficient maintenance (unless such maintenance is Contractor's responsibility), improper operation by parties other than the Contractor, or normal wear and tear and normal usage, but such exclusions shall only apply after Owner has taken occupancy of the portion of the Project at issue. If required by the Architect or the Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. Warranties shall become effective on a date established by the Owner and Architect in accordance with the Contract Documents. Notwithstanding anything in the Contract Documents to the contrary, Owner and Contractor expressly agree that the warranties stated herein shall mean the individual warranties associated with each particular Work or designated portion thereof within the Project, and each such individual warranty shall run from the date of Substantial Completion of the entire Work (unless otherwise expressly provided in the applicable Contract Documents for that particular Work). Such warranty shall be maintained notwithstanding that certain systems may be activated prior to Substantial Completion as required for the satisfactory completion of the Project. Contractor's warranties herein shall be interpreted to require Contractor to replace defective materials and equipment and re-execute defective Work which

is disclosed to the Contractor by the Owner within a period of one (1) year after Substantial Completion of the entire Work or designated portion thereof or, if latent defect, within one (1) year after discovery thereof by Owner. The Contractor shall perform all work reasonably required, to correct Work with errors, omissions, defects or deviations from what is required by the Contract Documents, at no cost to Owner. The warranties set out in this subparagraph are not exclusive of any other warranties, remedies or guarantees set out in other places in the Contract Documents or implied under applicable law, but are in addition to and not in limitation of any other such warranties, remedies, or guarantees.

**§ 3.5.2** The Contractor agrees to assign to the Owner at the time of Final Completion of the Work, such assignment to be effective no later than Final Completion, any and all third-party warranties relating to materials, equipment, machinery, components, and labor used in the Work and further agrees to perform the Work in such manner so as to preserve any and all such third-party warranties. Contractor shall take no action or fail to act in any way which results in the termination or expiration of any such third-party warranties or which otherwise results in prejudice to the rights of Owner under such warranties. Contractor's warranties shall in no way limit or abridge the warranties of the manufacturers and suppliers of equipment and systems which are to comprise a portion of the Work and all such warranties shall be in form and substance as required by the Contract Documents. Contractor agrees to provide all notices required for the effectiveness of such warranties and shall include provisions in the contracts with Subcontractors and Sub-subcontractors and other providers and manufacturers of such systems and equipment whereby Owner shall have a direct right, but not a duty, of enforcement of such warranty obligations.

**§ 3.5.3** The warranty(ies) provided in Section 3.5 and its subparts, including but not limited to Section 3.5.1, shall be interpreted to require Contractor to address failure, errors, omissions, defects, deviations, or other nonconformities of materials, products, or workmanship, defective materials and equipment and re-execute defective Work which is disclosed to the Contractor by the Owner or discovered by the Owner within a period of one (1) year after Substantial Completion of the entire Work or, if latent defect, within one (1) year after discovery thereof by Owner. Upon written notice from the Owner of any defects covered by warranty, the Contractor shall promptly remedy any such defects. If Contractor does not respond to Owner's written notice, either by beginning corrective work or notifying Owner in writing stating when work will begin, within ten (10) days of receipt of the notice or such shorter time as required in the Contract Documents, the Owner may take measures to correct the defects and Contractor will be obligated to reimburse the Owner's costs. Any measures taken by Owner to correct defects due to Contractor's failure to timely respond to Owner's written notice shall not operate to void or otherwise alter any warranties issued by, for, or through the Contractor. If notice of defects covered by warranty is given in writing to the Contractor on a timely basis, the obligation to provide the warranty work will extend beyond the applicable warranty period until the warranty defect is remedied and accepted by the Owner. The provisions of this subparagraph shall be in addition to, and not in lieu of, any other rights and remedies available to Owner. The Owner will determine and assign the warranty priority as follows:

**§ 3.5.3.1** Priority 1 - A complete shutdown situation. Owner is unable to operate. Safety or loss of building contents anticipated.. Unless shorter response durations exist in the Contract Documents, the Contractor shall provide warranty repair service within 8-hours' notice for warranty notice for the following:

1. Cooler and freezer equipment;
2. Primary Electrical Service
3. Chiller and pumps;
4. Boiler and pump;
5. Lift station;
6. Generator;
7. Elevator;
8. Roof leaks
9. Fire alarm and fire sprinkler malfunction

**§ 3.5.3.2** Priority 2 - A major component of Owner ability to operate is affected. Some aspects of the operation can continue but issue is a major problem. Unless shorter response durations exist in the Contract Documents, the Contractor shall provide warranty repair service within 24-hours' notice.

**§ 3.5.3.3** Priority 3 – Owner operation is unaffected, but the issue is affecting efficient operation by one or more people. Unless shorter response durations exist in the Contract Documents, the Contractor shall provide warranty repair service within 5-working days' notice.

§ 3.5.3.4 Priority 4 – The issue is an inconvenience or annoying but there are clear workarounds or alternates. Unless shorter response durations exist in the Contract Documents, the Contractor shall provide warranty repair service within 10-working days' notice.

§ 3.5.4 The Contractor shall issue in writing to the Owner as a condition precedent to final payment a "General Warranty" reflecting the terms and conditions of Sections 3.5.1, 3.5.2, and 3.5.3 for all Work under the Contract Documents. This General Warranty shall be assignable.

§ 3.5.5 Except when a longer warranty time is called for in the Contract Documents or is otherwise provided by law, the General Warranty shall be for twelve (12) months from the date of Substantial Completion of the entire Work and shall be in form and content otherwise satisfactory to the Owner. Contractor shall maintain a complete and accurate schedule of the date(s) of Substantial Completion, date(s) upon which the one-year warranty will expire, and date(s) of Final Completion. Contractor agrees to provide notice of the warranty expiration date to Owner and Architect at least one month prior to the expiration of the one-year warranty period. Prior to termination of the one year warranty period, Contractor shall accompany the Owner and Architect on re-inspection of the Work/building and be responsible for correcting any deficiencies not caused by the Owner or by the use of the building which are observed or reported during the re-inspection. Additionally, for a period beginning at Substantial Completion of any phase of the Work and extending twelve (12) months beyond Final Completion of any phase of the Work, upon request of the Owner, the Contractor shall, not less than once a month, attend a meeting with the Owner to review the facility operations and performance to identify defects, warranty issues, and proposed corrections; and to make appropriate written recommendations to the Owner. Any warranty work requiring a return to repair three (3) times may, at the Owner's discretion, require replacement of the equipment or defective material. Any warranty work completed within the final month of construction warranty phase shall extend for a minimum of 45 days beyond the date the work was completed. For extended warranties required by various sections, i.e. roofing, compressors, mechanical equipment, Owner will notify the Contractor of deficiencies and Contractor shall start remedying these defects within three (3) days of initial notification from Owner. Contractor shall prosecute the work without interruption until accepted by the Owner and the Architect, even though such prosecution should extend beyond the limit of the warranty period. If Contractor fails to provide notice of the expiration of the one-year warranty period at least one month prior to the expiration date, Contractor's warranty obligations described in this paragraph shall continue until such inspection is conducted and any deficiencies found in the inspection are corrected.

§ 3.5.6 Warranties shall become effective on a date established by the Owner and Architect in accordance with the Contract Documents. This date shall be the Date of Substantial Completion of the entire Work, unless otherwise provided in any Certificate of Partial Substantial Completion approved by the parties, except for work to be completed or corrected after the date of Substantial Completion and prior to final payment. Warranties for work to be completed or corrected after the date of Substantial Completion and prior to final payment shall become effective on the later of the date the work is completed or corrected and accepted by the Owner and Architect or the date of final payment.

§ 3.5.7 In the event an item under warranty fails, the Contractor shall extend the original warranty period by a length of time equal to the elapsed time which occurs from the notification in writing by the Owner or a warranty claim until acknowledgement by the Owner that the claim has been resolved.

§ 3.5.8 The warranties of Contractor in this Section 3.5 and its subparts shall in no way limit or abridge the warranties of the suppliers or manufacturers of equipment or systems which are to comprise a portion of the Work, and all of such warranties shall be in form and substance as required by the Contract Documents. Contractor shall not engage in any act or conduct, whether by commission or omission that results in the termination or expiration of such third party warranties or which otherwise operates to prejudice the rights of Owner under such warranties.

§ 3.5.9 When deemed necessary by the Owner and prior to installation of any item specifically made subject to a performance standard or regulatory agency standard under any provision of the Contract Documents, Contractor shall furnish proof of conformance to the Architect. Proof of conformance shall be in the form of: (1) an affidavit from the manufacturer certifying that the item is in conformance with the applicable standards; or (2) an affidavit from a testing laboratory certifying that the product has been tested within the past year and is in conformance with the applicable standards; or (3) such further reasonable proof as is required by the Architect. Contractor shall also



certify that the Project has been constructed in general conformance with the Architect's or Engineer's plans, specifications, and Construction Documents, as modified from time to time pursuant to the terms of the Contract Documents. Contractor shall complete all applicable certifications required by 19 Texas Administrative Code Section 61.1036-1040.

### **§ 3.6 Taxes**

Contractor shall pay all applicable local, county and state taxes, income tax, compensation tax, social security and withholding payments as required by law. Owner is an exempt entity under the tax laws of the State of Texas, and Contractor shall not include in the Contract Sum or any Modification any amount for any taxes from which the Owner is exempt by virtue of its status as a governmental entity and/or as a Texas independent school district. The Owner represents that this Project is eligible for exemption from the State Sales Tax on tangible personal property and material incorporated in the Project, provided that the Contractor fulfills the requirements of the Limited Sale, Excise and Use Tax Rules and Regulations. For the purpose of establishing exemption, it is understood and agreed that the Contractor may be required to segregate materials and labor costs at the time a Contract is awarded. Contractor will accept a Certificate of Exemption from the Owner. Contractor shall obtain Certificates of Resale from its suppliers. Failure of Contractor or any Subcontractor or Sub-subcontractor to obtain Certificates of Resale from their suppliers shall make the Contractor, Subcontractor, or Sub-subcontractor responsible for absorbing the tax, without compensation from Owner. CONTRACTOR HEREBY RELEASES, INDEMNIFIES AND HOLDS HARMLESS OWNER FROM ANY AND ALL CLAIMS AND DEMANDS MADE AS A RESULT OF THE FAILURE OF CONTRACTOR OR ANY SUBCONTRACTOR OR SUB-SUBCONTRACTOR TO COMPLY WITH THE PROVISIONS OF ANY OR ALL SUCH LAWS AND REGULATIONS.

### **§ 3.7 Permits, Fees, Notices and Compliance with Laws**

**§ 3.7.1** After the Architect has filed the plans and specifications with the Texas Department of Licensing and Regulation, the Architect shall notify Contractor that Contractor may make and submit the applications for the building permit. Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded. The Contractor shall procure (as required by the Contract Documents) all certificates of inspection, use; occupancy, permits and licenses, pay all charges, deposits and fees and give all notices necessary and incidental to the due and lawful prosecution of the Work. Certificates of inspection, use and occupancy shall be delivered to the Architect upon completion of the Work in sufficient time for occupation of the Project in accordance with the approved schedule for the Work. The costs of such procurement, payment and delivery are included within the Contract Sum, and constitute Costs of the Work unless otherwise provided by the Contract Documents.

**§ 3.7.1.1** The Contractor shall be responsible for timely notification to and coordination with all utility companies regarding the provision of services to the Project. The Contractor shall immediately inform the Architect when the Owner's participation is required, and the Architect will notify the Owner. Connections for temporary and permanent utilities, utility district/company inspections, tap charges, water meter charges, and any other similar fees assessed by jurisdictional authorities having control over the Project, as well as payment for temporary utilities services required for the Work, whether the Work is new construction or renovation of an existing facility, are the direct responsibility of the Contractor, without reimbursement from Owner, unless otherwise agreed in writing. If the Work is new construction, then payment for temporary and permanent utility services shall be the direct responsibility of the Contractor, without reimbursement from Owner, until Substantial Completion.

**§ 3.7.1.2** After consultation with the Owner, the Contractor shall obtain all permits and approvals for itself and the Owner, and pay all fees and expenses, if any, associated with National Pollutant Discharge Elimination System (NPDES) regulations administered by the Environmental Protection Agency (EPA) and local authorities, if applicable, that require completion of documentation and/or acquisition of a "Land Disturbing Activities Permit" for the Project. Also after consultation with the Owner, the Contractor shall obtain all permits and approvals, and pay all fees and expenses, if any, associated with Storm Water Pollution Prevention and Pollution Control Plan (SWPPP) regulations administered by the Texas Commission on Environmental Quality (TCEQ) and local authorities. Contractor shall coordinate processing all forms and fees with the Owner. Contractor's obligations under this Section may or may not require it to obtain or perform engineering services during the pre-construction phase to prepare proper drainage for the construction site. Any drainage alterations made by Contractor during the construction process, which require the issuance of a permit, shall be at Contractor's sole cost. Reimbursable

expenses shall not include any fines or penalties assessed against the Contractor, Contractor's Subcontractors or Sub-subcontractors, the Project, or the Owner

**§ 3.7.2** The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work. In addition, Contractor shall authorize posting of any notices concerning the Workers Compensation insurance carried by other parties involved in the Project, including without limitation, Architect, at the same location where Contractor posts notices regarding Workers Compensation. If applicable, the Contractor shall procure and obtain all bonds required of the Owner or the Contractor by the municipality in which the Project is located or by any other public or private body with jurisdiction over the Project. In connection with such bonds, the Contractor shall prepare all applications, supply all necessary back-up material and furnish the surety with any required personal undertakings. The Contractor shall also obtain and pay all charges for all approvals for street closings, traffic control, parking meter removal and other similar matters as may be necessary or appropriate from time to time for the performance of the Work.

**§ 3.7.3** If the Contractor performs Work when Contractor knows or reasonably should have known it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, the Contract Documents, or lawful orders of public authorities, the Contractor shall assume all responsibility for such Work and shall bear the costs attributable to correction.

**§ 3.7.4 Concealed or Unknown Conditions**

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and within forty-eight (48) hours after first observance of the conditions. Contractor agrees that this is a reasonable notice requirement. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend to the Owner that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. The Owner will then consider the facts and the reports of the Architect and the Owner will make the final determination of action. If the Contractor disputes the Owner's determination, the Contractor may submit a Claim as provided in Article 15.

**§ 3.7.5** If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect in writing. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

**§ 3.8 Allowances**

**§ 3.8.1** The Contractor shall include in the Contract Sum all Allowances stated in the Contract Documents. Items covered by Allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct. The inclusion of any Allowance or Contingency is solely for the benefit of the Owner. Expenditure of any Allowance or Contingency may only be made with prior written approval of the Owner and according to the procedures of Article 7. Owner's authorized representative may approve any expenditure from Allowances without further Board approval. If the Allowances or Contingency are not expended or not fully expended, then any unused portion shall belong to the Owner and shall be credited to the Owner in calculating Final Payment.

**§ 3.8.2** Calculation of costs or credits for Allowances shall be as described in article 7.1.4.

**§ 3.8.3** Materials and equipment under an Allowance shall be selected by the Owner with reasonable promptness.

§ 3.8.4 When performing Work under Allowances, Contractor shall solicit and receive not less than three written proposals, unless the requirement to obtain proposals is waived by the Owner in advance, and shall provide the Work as directed by the Architect, upon Owner's written approval, on the basis of the best value to the Owner.

### § 3.9 Superintendent and Project Manager

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site at all times during performance of the Work. In addition, the Contractor may employ a project manager and necessary assistants who may supervise several Project sites. The list of all supervisory personnel, including the project manager and superintendent, that the Contractor intends to use on the Project and a chain-of-command organizational chart shall be submitted to the Owner and Architect. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. Important communications shall be similarly confirmed in writing. Other communications shall be similarly confirmed on written request in each case. Questions about plan interpretation or directions shall be submitted to the Architect in the form of a written request for information and the Architect shall respond to such request for information in a reasonable and timely fashion. Contractor's selection of project manager or superintendent(s) shall be approved by Owner. The Contractor shall not engage supervisory personnel or utilize an organization and chain-of-command other than as approved by Owner and Architect, and Contractor shall not replace the project manager or superintendent(s) without Owner's consent or until a replacement project manager or superintendent(s) has been selected in accordance with this Section. The Owner may reject or require removal of any job superintendent, project manager or employee of the Contractor, Subcontractor or Sub-Subcontractor involved in the Project.

§ 3.9.2 Contractor's superintendent shall be present full-time on the site as soon as possible after commencement of the Work, and shall remain assigned to the Work, throughout the course of the Work until items requiring completion or correction, identified at Substantial Completion pursuant to Section 9.8, have been completed or corrected. From Substantial Completion until Final Completion, the superintendent shall be on the site as necessary to ensure that Final Completion occurs within the number of days required by the Agreement.

§ 3.9.3 Contractor's project manager, while not required to be present full-time at the site, shall remain assigned to the Work, and be available on an as-needed basis throughout the course of the Work until items requiring completion or correction, identified at Substantial Completion pursuant to Section 9.8, have been completed or corrected in accordance with the Construction Documents.

§ 3.9.4 Owner shall be notified not less than 24 hours before any time that superintendent will not be present at the site for any reason except periodic illness. If the reason is due to illness, then Owner shall be notified at the beginning of that day. Owner shall be notified of the identity of the acting superintendent. In the event the superintendent is absent from the site and notice has not been provided nor has an acting superintendent been assigned to the Work, then an amount equal to the superintendent's daily rate shall be deducted from the amount owed to the Contractor under General Conditions for such day.

### § 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, but in no case prior to the first application for payment, shall submit for the Owner's and Architect's review and approval a Contractor's construction schedule for the Work. The schedule shall be transmitted in the form of Microsoft Project in the native file format. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion and Final Completion; (2) an apportionment of the Work by construction activity; (3) the time required for completion of each portion of the Work; (4) predecessors and successors; (5) phases; (6) baseline start and stop dates; (7) actual start and stop dates; (8) current start and stop dates; (9) delays; (10) critical path; (11) submittals; (12) extensions of the Contract Time authorized by Change Orders, (13) anticipated Adverse Weather Days, (14) Anticipated Instructional Days, and (15) Owner activities. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project and, upon such revision, shall be submitted to Architect and Owner for their review and approval. In no case will the schedule be updated less frequently than each application for payment. The Contractor's schedule may be considered when evaluating a request for additional time.

- .1 If any updated schedule exceeds the time limits set forth in the Contract Documents for completion of the Work, the Contractor shall include with the updated schedule a statement of the reasons for the anticipated delay in completion of the Work and the Contractor's planned course of action for completing the Work within the time limits, inclusive of previously accepted time extensions, set forth in the Contract Documents. If the Contractor asserts that the failure of the Owner or the Architect to provide information to the Contractor is the reason for anticipated delay in completion, the Contractor shall also specify what information is required from the Owner or Architect.

**§ 3.10.2** The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's and Owner's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect and Owner reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals. The process of approving Contractor's schedules and updates to Contractor's schedule shall not constitute a warranty by the Owner that any non-Contractor milestones or activities will occur as set out on Contractor's schedule. Approval of a Contractor's schedule does not constitute a commitment by the Owner to furnish any Owner-furnished information or material any earlier than Owner would otherwise be obligated to furnish that information or material under the Contract Documents.

**§ 3.10.3** The Contractor shall perform the Work in general accordance with the most recent schedules submitted to and approved by the Owner and Architect. Submission of any schedule under this Contract constitutes a representation by the Contractor that: (1) the schedule represents the sequence in which the Contractor intends to prosecute the remaining Work; (2) the schedule represents the actual sequence and durations used to prosecute the completed Work; (3) that to the best of its knowledge and belief the Contractor is able to complete the remaining Work in the sequence and time indicated; and, (4) that the Contractor intends to complete the remaining Work in the sequence and time indicated.

**§ 3.10.4** The Contractor shall hold weekly progress meetings at the Project site, or at such other time and frequency as are acceptable to the Owner.

**§ 3.10.5** If reasonably required by Owner, Contractor shall also prepare and furnish project cash flow projections, manning data for critical activities, and schedules for the purchase and delivery of all critical equipment and material, together with periodic updating thereof.

**§ 3.10.6** The Contractor shall recommend to the Owner and to the Architect a schedule for procurement of long-lead time items which will constitute part of the Work as required to meet the project schedule.

**§ 3.10.7** In addition to the requirements of the Contract Documents, the Contractor's submittal schedule shall include submittals required for Substantial and Final Completion, as described by the Contract Documents, including but not limited to (1) individual specification section-required warranties, (2) certificates, (3) statements, (4) third-party tests.

**§ 3.10.8** The Owner's need for delivery of completed Work, or portions thereof, is largely controlled by the necessities of the school calendar and operations of school programs within the calendar year. Those needs are reflected in scheduled completion dates and milestone dates set out in the Contract Documents. The Contractor shall perform the Work in such a way as to not interfere with school operations and the importance of meeting milestones and completion dates is not exclusive.

### **§ 3.11 Documents and Samples at the Site**

**§ 3.11.1** The Contractor shall make available, at the Project site, one record copy of the Contract Documents, including Drawings, Specifications, Addenda, Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, including concealed mechanical, electrical and plumbing items inside of the facility and underground utilities at the site, and one record copy of the approved Shop Drawings, field test records, inspection certificates or records, manufacturers' certificates, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner at all times. At the completion of the Project,



all such documents and records shall be delivered to the Architect, with all changes made during construction, in an editable CAD format agreed to at the beginning of the Project along with (3) full sets of hard copy drawings and one digital copy in PDF format, for submittal to the Owner upon completion of the Work as a record of the Work as constructed, and shall be signed by the Contractor certifying to Owner thereby that they show complete and "as-built" conditions, stating sizes, kinds of materials, vital piping, conduit locations, and similar matters. These documents are to be considered part of the Work beyond the General Conditions. Other than Project identification, the documents shall not bear any professional seal or information or any reference to those firms providing professional services to the Owner, except for historical or reference purposes. This shall be completed and up to date within (30) working days from Substantial Completion and shall be a condition precedent to Final Payment.

**§ 3.11.2** Contractor shall at all times maintain job records, including, but not limited to, invoices, payment records, payroll records, daily reports, logs, diaries, and job meeting minutes, applicable to the Project. Contractor shall make such reports and records available to inspection by the Owner, Architect, or their respective agents, within five (5) working days of request by Owner, Architect, or their respective agents.

**§ 3.11.3** In addition to any other requirement in the Contract Documents and prior to installation, at Owner's or Architect's request, Contractor shall furnish or cause a Subcontractor or Sub-subcontractor to furnish, for the Owner's and Architect's written approval, a physical sample of each specified item, product, fixture or device which is visible by the general public and/or attached to an architecturally-finished surface. Samples shall be suitably labeled, adequately protected and properly stored at the site. Samples which are approved and undamaged will be considered to be suitable for incorporation into the Work.

### **§ 3.12 Shop Drawings, Product Data and Samples**

**§ 3.12.1** Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

**§ 3.12.2** Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

**§ 3.12.3** Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

**§ 3.12.4** Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

**§ 3.12.4.1** Submittals shall be submitted at the earliest possible time in order to expedite delivery of critical or long lead time items. For more complex systems and equipment (such as structural steel; doors, windows and hardware; casework; mechanical, electrical, and plumbing systems and equipment; food service equipment; sound systems and the like), the Contractor shall schedule at least 10 business days for the Architect or his Consultants' review and submittals shall be sequenced logically in accordance with the schedule, required fabrication and installation time. For submittals delivered by electronic transmission and received after 5:00 p.m. on a day on which the recipient's offices are open, or on a weekend, Holiday, or other day on which the recipient's offices are closed, submittals shall be deemed to have been duly served on the next day on which the recipient's offices are open.

**§ 3.12.4.2** The Contractor shall be prepared to submit color Samples on any key items (such as quarry tile, vinyl wall covering, etc.) within fifteen (15) days of the award of Subcontract(s). All color Samples required for the Work shall be received by the Architect no later than sixty (60) days of the date of the approval of the Contract Sum. Once samples of all key items are received, the Architect will finalize color selections.

**§ 3.12.5** The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect and Owner, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect and Owner or, in the absence of an

approved submittal schedule, as required under the Contract Documents. At a minimum, Contractor shall submit all submittals with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

**§ 3.12.6** By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. If, in the opinion of the Architect or Owner, the Shop Drawings are (a) incomplete, (b) indicate an inadequate understanding of the Work covered by the Shop Drawings, or (c) indicate a lack of study and review by the Contractor prior to submittal to the Architect, the Shop Drawings will be returned, unchecked, to the Contractor for correction of these deficiencies and subsequent resubmittal. The Architect's review of Contractor's submittals shall be limited to examination of an initial submittal and one (1) re-submittal. The Architect's review of additional submittals will be made only with the consent of the Owner after notification by the Architect. The Owner shall be entitled to reimbursement from the Contractor of amounts paid to the Architect for evaluation of such additional re-submittals.

**§ 3.12.7** The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect and/or Owner.

**§ 3.12.8** The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's or Owner's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect and Owner of such deviation at the time of submittal and (1) the Architect has given written approval of the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's or Owner's approval thereof except for any such errors or omissions which are within the Architect's statutory or contractual design responsibility..

**§ 3.12.9** The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

**§ 3.12.10** The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law; however, the Contractor represents and warrants that all Shop Drawings shall be prepared by persons and entities possessing expertise and experience in the trade for which the Shop Drawings are prepared and, if required by the Architect or applicable law, by a licensed architect or engineer.

**§ 3.12.10.1** If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.12.10.3 A registered architect must prepare plans and specifications for all the Work, as governed by the Texas Occupations Code Chapter 1051; and a registered engineer must prepare plans, specifications and estimates for all Work governed by Texas Occupations Code Chapter 1001. In the event that Contractor retains a licensed design professional under the terms of this section, Contractor shall require that the licensed design professional carry commercial general liability and errors and omissions insurance coverage in the same amounts and forms as required of the Architect on this Project. In the event that the licensed design professional retained by the Contractor will be conducting on-site services or observations, the licensed design professional shall also carry worker's compensation insurance and comprehensive automobile liability in the same amounts and forms as required of the Architect on this Project.

§ 3.12.11 The Contractor shall provide composite drawings within four (4) weeks of corresponding submittals approval showing how all piping, ductwork, lights, conduit and equipment, etc. will fit into the ceiling space allotted, including clearances required by the manufacturer, by Code, or in keeping with good construction practice. Space for all trade elements must be considered on the same drawing. Drawings shall be 1/4" per foot minimum scale and shall include invert elevations, elevation views and sections required to meet the intended purpose. Trades required to participate include, but are not necessarily limited to structural, mechanical, plumbing, fire sprinkler, electrical, data and special systems.

### § 3.13 Use of Site

§ 3.13.1 The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment. The Contractor shall be responsible for daily dust control without any additional expense. These costs shall be considered part of General Conditions.

§ 3.13.2 Only materials and equipment which are to be used directly in the Work shall be brought to and stored on the Project site by the Contractor. After equipment is no longer required for the Work, it shall be promptly removed from the Project site. Protection of construction material and equipment stored at the Project site from weather, theft, damage and all other adversity is solely the responsibility of the Contractor.

§ 3.13.3 The Contractor and any entity for whom the Contractor is responsible shall not erect any sign on the Project site without the prior consent of the Owner.

§ 3.13.4 Contractor shall ensure that the Work, at all times, is performed in a manner that affords the Owner reasonable access, both vehicular and pedestrian, to the site of the Work and all adjacent areas. The Work shall be performed, to the fullest extent possible, in such a manner that public areas adjacent to the site of the Work shall be free from all debris, building material and equipment likely to cause hazardous conditions. Without limitation of any other provision of the Contract Documents, Contractor shall use its best efforts to minimize any interference with the occupancy or beneficial use of any area and buildings adjacent to the site or the Work. Prior to the start of any Work which may impact or otherwise affect beneficial use or occupancy of an existing facility, the Contractor shall provide a work plan for such Work that identifies and controls any interruption for approval by the Owner. Work in this situation shall not proceed until an agreed plan of Work is approved in writing by the Owner.

§ 3.13.5 Without prior written approval of the Owner, the Contractor shall not permit any workers to use any existing facilities at the Project site, including, without limitation, lavatories, toilets, entrance and parking areas other than those designated by the Owner. Without limitation of any other provision of the Contract Documents, the Contractor shall use its best efforts to comply with all rules and regulations promulgated by the Owner in connection with the use and occupancy of the Project site.

### § 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly; provided, however, that any such cutting, fitting or patching can only be performed if the cutting, fitting or patching results in Work that is in accordance with the Contract Documents. All

areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

**§ 3.14.2** The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. Structural members shall not be cut and air duct shapes, piping sizes and related system designed elements shall not be changed or modified except with written permission of the Architect. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

**§ 3.14.3** After installation of the Work, Contractor shall carefully fit around, close up, repair, patch and paint such Work to match adjoining surfaces by use of proper tools and new materials using workers skilled in the required trades. All patching must include replacement or repair of any fire rated assembly to its full rating as required by current codes and standards at the point of Work or as may be required by the building official.

### **§ 3.15 Cleaning Up**

**§ 3.15.1** The Contractor, on a daily basis, shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. Contractor shall, not less than one time each week, clean up by removing rubbish, including old and surplus materials, to include dirt, debris, or trash. At no time shall trash, dirt or other debris be allowed to remain in any wall cavity, ceiling plenum, crawl space or concealed space. Immediately after unpacking materials, all packing case lumber or other packing materials, wrapping or other like flammable waste shall be collected and removed from the building and premises. Contractor shall provide on-site containers for the collection of waste materials, debris and rubbish, and shall periodically remove waste materials, debris and rubbish from the Work and dispose of all such materials at legal disposal areas away from the site. At completion of the Work, the Contractor shall remove all waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project and shall clean, sweep, mop, brush and polish, as appropriate, the interior of the improvements or renovated areas, including but not limited to, any floors, carpeting, ducts, fixtures, and ventilation units operated during construction. Contractor shall clean exterior gutters, drainage, walkways, driveways and roofs of debris. All cleaning operations shall be scheduled so as to ensure that contaminants resulting from the cleaning process will not fall on newly-coated or newly-painted surfaces. Care shall be taken by all workers not to mark, soil, or otherwise deface any finish. In the event that any finish becomes defaced in any way as a result of such activities, the Contractor or any of his Subcontractors or Sub-subcontractors shall clean and restore such surfaces to their original condition.

**§ 3.15.2** If the Contractor fails to clean up as provided in the Contract Documents, the Owner, at its discretion, may perform the clean-up and withhold costs incurred from funds due to Contractor or, if the costs incurred are in excess of the funds due to the Contractor, may require the Contractor to reimburse the Owner for the costs incurred.

**§ 3.15.3** The Contractor shall be responsible for the protection of the Work. Prior to the Architect's inspection for Substantial Completion, the Contractor shall clean exterior and interior surfaces exposed to view; remove temporary labels, stains, putty, soil, paint and foreign substances from all surfaces, including glass and painted surfaces; polish transparent and glossy surfaces; clean equipment and fixtures to a sanitary condition; replace air filters in mechanical equipment; clean roofs, gutters, and downspouts; remove obstructions and flush debris from drainage systems; clean site; sweep paved areas and rake clean other surfaces; remove trash and surplus materials from the site; clean and polish all floors; clean and polish all hardware; and repair all Work damaged during cleaning.

**§ 3.15.4** Prior to Final Completion, in addition to any additional final cleaning work specified in the Contract Documents (including the Specifications), Contractor shall: (1) employ skilled workers for final cleaning; (2) remove grease, mastic adhesive, dust, dirt, stains, fingerprints, labels and other foreign materials from all sight-exposed interior and exterior surfaces; (3) wash and shine glazing and mirrors; (4) polish glossy surfaces to a clear shine; (5) vacuum clean carpeted and similar soft surfaces; (6) clean (damp mop with clean mop and water) resilient and hard surface floors repeating as necessary until no visible residue remains on floors; (7) clean plumbing fixtures to a sanitary condition; (8) clean surfaces of all equipment and remove excess lubrication; (9) clean permanent filters and replace disposable filters in ventilating systems if units were operated during construction and clean ducts, blowers and coils; (10) clean light fixtures; (11) remove waste, foreign matter and debris from roofs, gutters, area ways and drainage ways; (12) remove waste, debris and surplus materials from the site; (13) remove stains, spills



and foreign substances from paved areas; and (14) broom clean exterior concrete and paved surfaces and rake clean the grounds.

### **§ 3.16 Access to Work**

The Contractor shall provide the Owner and Architect, and their designated representatives, with access to the Work in preparation and progress wherever located. Upon request of the Architect or Owner, the Contractor shall accompany the Architect or Owner on an inspection of the Work. The presence of the Owner, Architect or their representatives does not constitute acceptance or approval of the Work.

### **§ 3.17 Royalties, Patents and Copyrights**

The Contractor shall pay all royalties and license fees with respect to the Contract or the Work. THE CONTRACTOR SHALL DEFEND SUITS OR CLAIMS FOR INFRINGEMENT OF COPYRIGHTS AND PATENT RIGHTS, WAIVE AND RELEASE ANY CLAIMS AGAINST THE OWNER AND ARCHITECT WITH RESPECT THERETO, AND INDEMNIFY AND HOLD HARMLESS THE OWNER AND ARCHITECT FROM ANY LOSS ON ACCOUNT THEREOF, PROVIDED, HOWEVER, THAT CONTRACTOR SHALL NOT BE RESPONSIBLE TO ARCHITECT FOR DEFENSE OR LOSS WHEN A PARTICULAR DESIGN, PROCESS, OR PRODUCT OF A PARTICULAR MANUFACTURER OR MANUFACTURERS IS REQUIRED BY THE CONTRACT DOCUMENTS, OR WHERE THE COPYRIGHT VIOLATIONS ARE CONTAINED IN DRAWINGS, SPECIFICATIONS, OR OTHER DOCUMENTS PREPARED BY THE ARCHITECT. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless notice of such infringement is promptly furnished to the Owner and Architect in writing.

### **§ 3.18 Indemnification**

**§ 3.18.1** TO THE FULLEST EXTENT PERMITTED BY LAW, THE CONTRACTOR SHALL WAIVE AND RELEASE CLAIMS AGAINST AND SHALL DEFEND, INDEMNIFY AND HOLD HARMLESS THE OWNER, ITS TRUSTEES, OFFICERS, AND CONSULTANTS, ARCHITECT, ARCHITECT'S CONSULTANTS, AND AGENTS AND EMPLOYEES OF ANY OF THEM FROM AND AGAINST CLAIMS, DAMAGES, LOSSES, CAUSES OF ACTION, SUITS, JUDGMENTS, AND EXPENSES, INCLUDING BUT NOT LIMITED TO ATTORNEYS' FEES, ARISING OUT OF OR RESULTING FROM PERFORMANCE OF THE WORK, PROVIDED THAT SUCH CLAIM, DAMAGE, LOSS, OR EXPENSE IS ATTRIBUTABLE TO BODILY INJURY, SICKNESS, DISEASE OR DEATH, OR TO INJURY TO OR DESTRUCTION OF TANGIBLE PROPERTY (INCLUDING THE WORK ITSELF), INCLUDING LOSS OF USE RESULTING THEREFROM, BUT ONLY TO THE EXTENT CAUSED IN WHOLE OR IN PART BY THE ACTS OR OMISSIONS OF THE CONTRACTOR, A SUBCONTRACTOR, ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY THEM, ANYONE THEY CONTROL OR EXERCISE CONTROL OVER, OR ANYONE FOR WHOSE ACTS THEY MAY BE LIABLE, REGARDLESS OF WHETHER OR NOT SUCH CLAIM, DAMAGE, LOSS, OR EXPENSE IS CAUSED IN PART BY ANY ACTS OR OMISSIONS OF OWNER OR OWNER'S CONSULTANTS OR ANY OTHER PARTY INDEMNIFIED HEREUNDER. SUCH OBLIGATION SHALL NOT BE CONSTRUED TO NEGATE, ABRIDGE, OR REDUCE OTHER RIGHTS OR OBLIGATIONS OF INDEMNITY THAT WOULD OTHERWISE EXIST AS TO A PARTY OR PERSON DESCRIBED IN THIS SECTION 3.18. ALL COSTS AND EXPENSES SO INCURRED BY ANY OF THE INDEMNIFIED PARTIES IN THAT EVENT SHALL BE REIMBURSED BY CONTRACTOR, AND ANY COSTS AND EXPENSES SO INCURRED BY INDEMNIFIED PARTIES SHALL BEAR INTEREST UNTIL REIMBURSED BY CONTRACTOR, AT THE POST-JUDGMENT INTEREST RATE PROVIDED TO BE PAID UNDER THE LAWS OF THE STATE OF TEXAS.

**§ 3.18.2** IN CLAIMS AGAINST ANY PERSON OR ENTITY INDEMNIFIED UNDER THIS SECTION 3.18 BY AN EMPLOYEE OF THE CONTRACTOR, A SUBCONTRACTOR, A SUB-SUBCONTRACTOR, ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY THEM, OR ANYONE FOR WHOSE ACTS THEY MAY BE LIABLE, THE INDEMNIFICATION OBLIGATION UNDER SECTION 3.18.1 SHALL NOT BE LIMITED BY A LIMITATION ON AMOUNT OR TYPE OF DAMAGES, COMPENSATION, OR BENEFITS PAYABLE BY OR FOR THE CONTRACTOR OR A SUBCONTRACTOR UNDER INSURANCE POLICIES, WORKERS' COMPENSATION ACTS, DISABILITY BENEFIT ACTS, OR OTHER EMPLOYEE BENEFIT ACTS.

### **§ 3.18.3**

THE OBLIGATIONS OF THE CONTRACTOR UNDER THIS SECTION 3.18 SHALL NOT EXTEND TO THE LIABILITY OF THE ARCHITECT, THE ARCHITECT'S CONSULTANTS, AND AGENTS AND EMPLOYEES OF ANY OF THEM, CAUSED BY OR RESULTING FROM: (1) DEFECTS IN PLANS, DESIGNS, OR SPECIFICATIONS PREPARED, APPROVED, OR USED BY THE ARCHITECT OR ENGINEER; OR (2) NEGLIGENCE OF THE ARCHITECT OR ENGINEER IN THE RENDITION OR CONDUCT OF PROFESSIONAL DUTIES CALLED FOR OR ARISING OUT OF THE CONSTRUCTION CONTRACT AND THE PLANS, DESIGNS, OR SPECIFICATIONS THAT ARE A PART OF THE CONSTRUCTION CONTRACT; AND (3) ARISING FROM: (A) PERSONAL INJURY OR DEATH; (B) PROPERTY DAMAGE; OR (C) ANY OTHER EXPENSE THAT ARISES FROM PERSONAL INJURY, DEATH, OR PROPERTY DAMAGE, OR AS OTHERWISE LIMITED BY TEXAS CIVIL PRACTICE & REMEDIES CODE SECTION 130.001 ET SEQ.

**§ 3.18.4** CONTRACTOR SHALL BE RESPONSIBLE FOR AND SHALL HOLD OWNER FREE AND HARMLESS FROM LIABILITY RESULTING FROM LOSS OF OR DAMAGE TO CONTRACTOR'S OR ITS SUBCONTRACTOR'S OR SUB-SUBCONTRACTOR'S CONSTRUCTION TOOLS AND EQUIPMENT AND RENTED ITEMS WHICH ARE USED OR INTENDED FOR USE IN PERFORMING THE WORK REGARDLESS OF WHETHER SUCH LOSS OR DAMAGE IS CAUSED IN PART BY AN ACT OR OMISSION OF OWNER OR ITS AGENTS, OFFICERS, OR EMPLOYEES. THIS PROVISION SHALL APPLY, WITHOUT LIMITATION, TO LOSS OR DAMAGE OCCURRING AT THE WORK SITE OR WHILE SUCH ITEMS ARE IN TRANSIT TO OR FROM THE WORK SITE AND IS IN ADDITION TO CONTRACTOR'S OBLIGATIONS UNDER SECTION 3.18.1.

**§ 3.18.5** THE OWNER MAY CAUSE ANY SEPARATE CONTRACTOR WHO MAY HAVE A CONTRACT WITH THE OWNER TO PERFORM CONSTRUCTION OR INSTALLATION WORK IN THE AREAS WHERE WORK WILL BE PERFORMED UNDER THIS AGREEMENT, TO AGREE TO INDEMNIFY AND TO HOLD THE OWNER AND THE CONTRACTOR HARMLESS FROM ALL CLAIMS FOR BODILY INJURY AND PROPERTY DAMAGE TO THE SAME EXTENT AS IS PROVIDED IN SECTION 3.18.1 ABOVE. LIKEWISE, CONTRACTOR AGREES TO INDEMNIFY AND TO HOLD THE OWNER'S SEPARATE CONTRACTORS HARMLESS FROM ALL CLAIMS FOR BODILY INJURY AND PROPERTY DAMAGE TO THE SAME EXTENT AS PROVIDED IN SECTION 3.18.1 ABOVE.

**§ 3.18.6** THE CONTRACTOR AGREES TO WAIVE ANY AND ALL CLAIMS IT MAY HAVE AGAINST THE OWNER, CONNECTED WITH, RESULTING FROM, OR ARISING OUT OF, CLAIMS AND SUITS COVERED BY THE INDEMNIFICATION AGREEMENT CONTAINED HEREIN AND AGREES THAT ANY INSURANCE POLICY SHALL PROVIDE FOR THE WAIVER OF SUBROGATION RIGHTS AGAINST THE OWNER.

**§ 3.18.7** To the extent allowed by law, the Contractor agrees to insure the indemnity and hold harmless clauses contained in this Section 3.18, including its subparts, with insurance policies, approved by the Owner, and issued by a carrier authorized to do business in the State of Texas, in the minimum amounts set out in Article 11 and/or Section 11.1 of these General Conditions.

**§ 3.18.8** The provisions of Section 3.18 in its entirety, including all of its subparts, shall survive the completion, termination, or expiration of the Contract, howsoever caused, and no payment, partial payment, nor issuance of a certificate of Substantial Completion nor a certificate of Final Completion nor acceptance of occupancy in whole or in part of the Work shall waive or release any of the provisions of Section 3.18 and its subparts.

### **§ 3.19 Antitrust Violation**

To permit the Owner to recover damages suffered in antitrust violations, Contractor hereby assigns to Owner any and all claims for overcharges associated with this Contract which violate the antitrust laws of the United States, 15 U.S.C.A. Section 1 et seq. The Contractor shall include this provision in its agreements with each Subcontractor, Sub-subcontractor and supplier. Each Subcontractor shall include such provisions in agreements with sub-subcontractors and suppliers.

### **§ 3.20 Record Drawings**

**§ 3.20.1** At the completion of the Project, the Contractor shall submit complete "as built" drawings, with all changes made during construction, including concealed mechanical, electrical and plumbing items inside of the facility and underground utilities at the site. The drawings shall be submitted in an editable native file CAD format agreed to at

the beginning of the project along with (1) full set of hard copy drawings and one digital copy in PDF format. All as-built drawings shall be computer drafted in CAD. Hand drawn corrections are not considered As-Built drawings. These documents are to be considered part of the Work beyond the General Conditions. The documents shall not bear any professional seal or information other than project identification. This shall be completed and up to date within (30) working days from Substantial Completion. Refer to 5.1.7.3 of the Agreement regarding delivery of As-Built drawings and retainage release.

## **ARTICLE 4 ARCHITECT**

### **§ 4.1 General**

**§ 4.1.1** The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

**§ 4.1.2** The Owner shall notify the Contractor when duties, responsibilities, and limitations of authority of the Architect have been modified.

**§ 4.1.3** Except as expressly provided herein, the Contractor shall not be relieved of Contractor's obligation to perform the Work in strict accordance with the Contract Documents by the duties, responsibilities, or activities of the Architect.

### **§ 4.2 Administration of the Contract**

**§ 4.2.1** The Architect or its authorized representative will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues a recommendation that the Final Payment is due, and, with the Owner's concurrence, from time to time during the one-year period for correction of Work described in Section 12.2.. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents or expressly authorized by the Owner in writing.

**§ 4.2.2** Architect or its authorized representative shall visit the site at least twice per week (or more per week when deemed necessary by the Owner or when necessary to protect Owner's interests) and at other intervals appropriate to the stage of construction, to inspect the progress, quantity and quality of the Work completed, to reject any observed nonconforming Work, and to determine if the Work is being performed in a manner indicating that the Work, when completed, will be in accordance with the Contract Documents and on time. Furthermore, a minimum of two job site meetings per month from commencement of construction through Final Completion will be initiated by the Architect and attended by the Contractor. Attendees will include the Owner, the Contractor's project manager and/or superintendent, Architect's project representative, and Architect. The Architect, Owner and their representatives shall at all times have access to the Work. Architect or its authorized representative will provide on-site observations prior to and during all concrete pours that contribute to the structural integrity of the building, including all pours of concrete piers, footings, grade beams, floor slabs, and concrete superstructure components, if applicable. In addition, Architect or its authorized representative will provide on-site observations prior to covering up or closing up of portions of the construction which, if covered, would conceal problems with the structural integrity of the Project. Contractor shall provide notice and shall not close or cover said Work until said observations have occurred. Contractor or Architect will advise Owner of the need for any third party laboratory or testing services to assist the Architect and Owner. On the basis of the on- site observations by Architect, Architect shall keep Owner and Contractor informed of the progress and quality of the Work, through Architect's field reports, and shall guard Owner against defects and deficiencies in the Work. Architect shall promptly notify Owner and Contractor orally regarding any defect or nonconforming Work, which shall be followed by notice in writing of defects or nonconforming Work noted and corrective actions taken or recommended. The Architect, however, shall not have control over or responsibility for the Contractor's construction means, methods, techniques, sequences, procedures, or safety programs, but this does not relieve Architect of Architect's responsibilities under the Contract. Any services by Contractor made necessary by Contractor's construction defect or nonconforming Work shall be performed at no additional cost to Owner.

**§ 4.2.3** On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not

have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, Sub-subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work. The Contractor shall reimburse the Owner for compensation paid to the Architect for additional site visits made necessary by the fault, neglect, or request of the Contractor.

#### **§ 4.2.4 Communications**

Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized by the Owner or Architect, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors, Sub-subcontractors, and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols. Notwithstanding the foregoing, Owner reserves the right to communicate directly with the Contractor and Subcontractors.

**§ 4.2.5** As further provided in the Contract Documents, based on the Architect's evaluations of the Work progress and quality of the Work and of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts, which shall be further subject to the Owner's review, modification, approval, or rejection.

**§ 4.2.6** The Architect and Owner each has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect or the Owner considers it necessary or advisable, the Architect and/or the Owner will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. Testing or inspections required by this section shall be conducted subject to the requirements of Chapter 2269 of the Texas Government Code. However, neither this authority of the Architect or the Owner nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect or the Owner to the Contractor, Subcontractors, Sub-subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work, or constitute approval or acceptance of Work that is deficient or does not meet the requirements of the Contract Documents. Architect and/or Contractor shall promptly notify, orally and in writing, the other party and Owner of any fault or defect in the Project or Construction Documents or nonconformance with the Contract Documents they may respectively discover (or reasonably should have discovered using ordinary diligence) and each, upon discovery of the defect or nonconformance, shall be responsible for notifying the other party and Owner of those corrective actions they respectively take; provided, however, Contractor shall have no duty to notify Owner of discoveries made or actions taken by Architect. If Architect or Contractor fails to disclose, in writing, any known defects in the Project or Construction Documents it discovers or reasonably should discover using ordinary diligence, the non-disclosing party (Architect and/or Contractor) shall be liable for the consequences of such defects resulting from the failure to disclose. In the event of a disagreement between the Architect and Contractor, the Owner will make the final determination after reviewing all of the information.

**§ 4.2.7** The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents and all applicable laws, statutes, codes and requirements applicable to Architect's design services. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness as to cause no delay in the Work or in the activities of the Owner, Contractor, or Separate Contractors, while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is conducted for the general purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component. If any submittal does not comply with the requirements of the Contract Documents, then Architect shall require Contractor to come into compliance. The Architect shall promptly report in writing to the Contractor and Owner any errors, inconsistencies and/or omissions discovered by the Architect in the Shop Drawings, Product Data and Samples.



§ 4.2.8 The Architect shall review, prepare and make recommendations to Owner regarding all Change Orders and Construction Change Directives for the Owner's approval and execution in accordance with the Contract Documents, accompanied by all supporting documentation. The Architect may authorize minor changes in the Work not involving an adjustment in Contract Sum or an extension of the Contract Time which are consistent with the intent of the Contract Documents. If necessary, the Architect shall prepare, reproduce and distribute Drawings and Specifications to describe Work to be added, deleted or modified, as provided in Section 7.4. The Architect shall accept requests by the Owner, and shall review properly prepared, timely requests by the Contractor for changes in the Work, including adjustments to the Contract Sum or Contract Time. A properly prepared request for a change in the Work by the Contractor shall be accompanied by sufficient supporting data and information to permit the Architect to make a reasonable determination without extensive investigation or preparation of additional drawings or specifications. If the Architect determines that requested changes in the Work are not materially different from the requirements of the Contract Documents and do not change the Contract Sum or Contract Time, then the Architect may issue an order for a minor change in the Work with prior written notice to the Owner, or recommend to the Owner that the requested change be denied. The Architect is not authorized to approve changes involving major systems such as: Heating, Ventilation and Air Conditioning ("HVAC"); roof; foundation; outward appearance; color schemes; floor plans; building materials; drainage; or mechanical equipment without Owner's prior written consent.

§ 4.2.9 The Architect will conduct inspections and, in consultation with the Owner, determine the date or dates of Substantial Completion and the date of Final Completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10. In the event Architect is required to perform more than two inspection(s) to determine the date or dates of Substantial Completion or Final Completion due to Contractor's failure to meet the conditions for such completion, Contractor shall be responsible for paying or reimbursing Owner for the cost of any Additional Services charged by Architect or Consultants under the agreement between Owner and Architect.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and make recommendations on matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor, which shall be copied to the other.. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. The Owner will make the final determination of all matters concerning performance after consultation with the Architect.

§ 4.2.12 Interpretations or recommendations of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and recommendations, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Owner's decisions on matters relating to aesthetic effect shall be final if (a) they are consistent with the intent expressed in the Contract Documents, and (b) the Owner gives its consent.

§ 4.2.14 Contractor is allowed a reasonable number of requests for information that are initiated by Contractor and if Contractor exceeds that reasonable amount, as determined by the Architect, in its sole discretion, Contractor shall pay the Architect's fee for review of any additional requests for information. The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information. In the event of a disagreement between the Architect and Contractor, the Owner will make the final determination after reviewing all of the information.

§4.2.15 The Contractor shall not cover up work without the Architect and Owner performing an observation of such

work. The Contractor shall be responsible for any and all associated costs to allow for observation of the work, uncovered, by the Architect and Owner. If the Contractor covers work without either the consent of the Architect and Owner or without providing the Architect and Owner with reasonable opportunity to observe the work, whether or not such work is found to be acceptable by the Architect or Owner, the Contractor shall repair such work at no cost to the Owner.

## **ARTICLE 5 SUBCONTRACTORS**

### **§ 5.1 Definitions**

**§ 5.1.1** A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site, away from the site, or otherwise to furnish labor or materials. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor. The term "Subcontractor" includes persons supplying materials or equipment for the Work.

**§ 5.1.2** A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site, away from the site, or otherwise to furnish labor or materials. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor. The term "Sub-subcontractor" includes persons supplying materials or equipment for the Work.

### **§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work**

**§ 5.2.1** Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection. All Subcontractors shall be procured in accordance with Texas Education Code Chapter 44, Subchapter B, and Texas Government Code Chapter 2269, as applicable. If Contractor is a Construction Manager at Risk, all trade contractors and Subcontractors shall be procured in accordance with Sections 2269.255 and 2269.256 of the Texas Government Code. A notice of no reasonable objection shall in no way relieve the Contractor from full responsibility for performance and completion of the Work and its obligations under the Contract Documents. The Contractor shall be fully responsible for the performance of its Subcontractors, and Sub-subcontractors, including those recommended or approved by the Owner.

**§ 5.2.2** The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable and timely objection.

**§ 5.2.3** If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. When the parties agree on a proposed substitute Subcontractor or if the Owner requires use of a specific Subcontractor, then the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required. "Reasonable Objection" shall include, but not be limited to, Owner or Architect's prior experience of unsatisfactory work performed by the Subcontractor or debarment of the Subcontractor.

**§ 5.2.4** The Contractor shall not substitute a Subcontractor, Sub-subcontractor person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

**§ 5.2.5** The Owner may require the Contractor to change any subcontractor or supplier previously approved by it, if such a change is due to failure of subcontractor to perform in accordance with the requirements of the Contract. If Owner requires removal of a subcontractor for such failure to perform, and Contractor reasonably objects to such removal, then Owner will pay any actual increase in the cost between the new subcontractor and the subcontractor

replaced incurred by Contractor, taking into account any amounts which Contractor withholds or recovers in damages from the replaced subcontractor. If Contractor requests such payment from Owner, Contractor shall provide Owner with satisfactory proof of such additional costs incurred by Contractor.

**§ 5.2.6** Contractor shall be fully responsible for the performance of its subcontractors, including those selected or approved by the Owner.

### **§ 5.3 Subcontractual Relations**

**§ 5.3.1** By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. The terms and conditions of the Contract Documents shall be incorporated by reference into each subcontract agreement, except as provided below. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors. Each Subcontractor and Sub-subcontractor shall provide proof of insurance to Contractor consistent with the Contractor's insurance to Owner and in amount commensurate with the Work to be performed by the Subcontractor or Sub-subcontractor.

**§ 5.3.2** Neither the Owner nor the Architect shall be obligated to pay or to ensure the payment of any monies to Subcontractors or Sub-subcontractor due to any non-payment to the Contractor, non-payment of Subcontractors by the Contractor, or non-payment of Sub-subcontractors by Subcontractors.

**§ 5.3.3** The Contractor shall require any potential Subcontractor to disclose to the Contractor any ownership interest or familial relationship between the Contractor, the Architect or the Owner and the potential Subcontractor prior to entering into a subcontract. Contractor shall report to Owner all such disclosures and the Owner shall have the right, in its sole discretion, to reject any such affiliated Subcontractor.

### **§ 5.4 Contingent Assignment of Subcontracts**

**§ 5.4.1** Each subcontract agreement for any unperformed portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract either in accordance with Article 14 or abandonment of the Project by the Contractor and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor;
- .2 assignment is subject to the prior rights and obligations of the surety, if any, obligated under bonds relating to the Contract;
- .3 such assignment shall not constitute a waiver by Owner of any of its rights against Contractor, because of defaults, delays and defects for which a Subcontractor or material vendor may also be liable; and
- .4 the Subcontractor provides bonds as required by law of prime contractors, and by Owner.

If the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract, provided, however, that Owner does not assume Contractor's obligations or liabilities for defaults occurring prior to Owner's assumption, or for the payment to the Subcontractor or supplier for Work, if payment for such Work has previously been made to Contractor. Such liabilities or obligations shall remain with Contractor. Owner shall only be responsible for compensating Subcontractors for Work performed or materials furnished from and after the date on which the Owner gives written notice of its acceptance of the subcontract agreement. Owner shall not be responsible for any Work performed or materials furnished by Subcontractors prior to the date of Owner's written notice of acceptance.

§ 5.4.2 Such assignment shall not constitute a waiver by Owner of any of its rights against Contractor, including, but not limited to, claims for defaults, delays or defects for which a Subcontractor, Sub-subcontractor, or vendor may also be liable.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity.

§ 5.4.4 All subcontracts shall state that they will be assignable to the Bond Trustee or his designee, if funding for the Project is obtained through bond proceeds.

#### § 5.5 Notice of Subcontractor Default

Contractor shall promptly notify Owner and Architect in writing of any material defaults by any Subcontractor or Sub-subcontractor. Notwithstanding any provision contained in Article 5 to the contrary, it is hereby acknowledged and agreed that Owner has in no way agreed, expressly or implicitly, nor will Owner agree, to allow any Subcontractor, Sub-subcontractor or other materialman or worker employed by Contractor the right to obtain a personal judgment or to create a mechanic's or materialman's lien against Owner for the amount due from the Owner or the Contractor.

### ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

#### § 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained for the Project. The Owner further reserves the right to perform other non-Project-related construction work, maintenance and repair work, and school program operations at the site and near the site during the time period of the Work.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement and submit such revisions to the Owner for the Owner's approval. The construction schedules, if approved by the Owner, shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same rights that the Contractor has under the Conditions of the Contract.

#### § 6.2 Mutual Responsibility

§ 6.2.1 It shall be the responsibility of the Contractor to assist, review, and coordinate the scheduling of work performed by any of the Owner's Separate Contractors. In addition, the Contractor shall be responsible for coordinating and providing all construction administration necessary for the Work and the work of any of Owner's Separate Contractors. The Contractor shall afford the Owner and Separate Contractors reasonable site access and opportunity for introduction and storage or staging of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents. Contractor shall be responsible for coordination between Contractor's Subcontractors, Sub-subcontractors and Owner's Separate Contractors. Contractor shall review Owner's contract with Owner's Separate Contractors and become familiar with the requirements and scope of services contained therein.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect and Owner in writing of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of



the Contractor's Work and shall promptly report in writing to the Architect and Owner if Owner's Separate Contractors otherwise fail in any way to timely perform their services or negatively impact Contractor's schedule or ability to perform the Work. Failure of the Contractor to notify the Architect and Owner of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work and is performed in a timely manner. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not actually known to Contractor and are not reasonably apparent.

**§ 6.2.3** The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for actual costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

**§ 6.2.3.1** If the Architect is required to provide contingent additional services as provided in the Agreement between the Owner and the Architect, specifically relating to additional compensation for the Architect for evaluating an excessive number of claims submitted by the Contractor or others in connection with the Work in accordance with the Owner's Agreement with the Architect, then such services shall be paid for by the Contractor through the Owner, unless the contingent additional services result from negligence or an omission by the Architect.

**§ 6.2.3.2** If the Architect provides services in connection with a legal proceeding, except when the Architect is a party thereto, and the Owner requests the Architect in writing to provide such services, then the cost of such services shall be paid for by the party whose act or omission was a proximate cause of the problem that led to the requirement to provide such services. Such services shall be paid for by such party through the Owner, who upon receipt of same shall reimburse the Architect.

**§ 6.2.3.3** All construction costs resulting from the Contractor's negligence, lack of oversight, inattention to detail, failure to investigate or failure to follow the Contract Documents, will be borne by the Contractor.

**§ 6.2.4** The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

**§ 6.2.5** The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14. If such Separate Contractor initiates a claim or legal or any other proceedings against the Owner on account of any damage alleged to have been caused by the Contractor, the Owner shall notify the Contractor, who shall defend such proceedings at its own expense, and if any judgment or award against the Owner arises therefrom, based on Contractor's act or omissions or the act or omissions of Contractor's employees, Subcontractor, Sub subcontractor, or parties for whom Contractor has liability, the Contractor shall pay or satisfy it and shall reimburse the Owner for all attorneys' fees and court and other costs which the Owner has incurred over and above those paid for directly by the Contractor.

**§ 6.2.6** The Contractor shall be responsible for any delays to a Separate Contractor caused by the Contractor or its Subcontractors, Sub-subcontractors, or suppliers.

### **§ 6.3 Owner's Right to Clean Up**

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and then allocate the cost among those responsible.

## **ARTICLE 7 CHANGES IN THE WORK**

### **§ 7.1 General**

**§ 7.1.1** Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents. A properly prepared written request for a change in the Work by Contractor shall be accompanied by sufficient supporting data and information to permit the Architect to make a recommendation to Owner.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires the approval of the Owner and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued, subject to the Owner's approval, by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work. Contractor shall not make any claim for an adjustment to the Contract Sum or Contract Time due to: a change in the materials used; a change in the specified manner of constructing and/or installing the Work; or additional labor, services, or materials, beyond that actually required by the terms of the Contract Documents, unless made pursuant to a written order or directive from Owner authorizing Contractor to proceed with a Change in the Work. No claim for an adjustment to Contract Sum or Contract Time shall be valid unless so ordered or directed.

§ 7.1.4 Calculation of costs or credits for Changes, minor changes, Proposals, Contingency expenditures and Allowance expenditures:

1. When calculating the Cost of the Work for Changes, minor changes, Proposals, Contingency expenditures and Allowances, the Contractor shall furnish and include substantiation to satisfaction of the Owner of the following from Subcontractors:

Description of Subcontractor Cost of the Work Element

- A Bare Material Costs
- B Labor Hours
- C Direct Labor Costs (See Article 1 Definitions)
- D Labor Cost Burden (See Article 1 Definitions)
- E Equipment
- F Work performed by Sub-subcontractor (if any), where Sub-subcontractor Overhead and Profit shall not exceed 10%
- G Subcontractor's Overhead and Profit, which shall not exceed 10% of A through F
- H Contractor's Overhead and Profit, which shall not exceed 10% of A through G
- I Cost of the Work (Sum of A through H)

2. When Contractor self performs work, when calculating the Cost of the Work for Changes, minor changes, Proposals, Contingency expenditures and Allowances, the Contractor shall furnish and include substantiation to satisfaction of the Owner of the following:

Description of Contractor Cost of the Work Element

- A Bare Material Costs
- B Labor Hours
- C Direct Labor Costs (See Article 1 Definitions)
- D Labor Cost Burden (See Article 1 Definitions)
- E Equipment
- F Contractor's Overhead and Profit, which shall not exceed 10% of A through E
- G Cost of the Work (Sum of A through F)

No additional Fee or General Conditions cost shall apply to self-performed Work.

3. By Unit Prices stated in the Contract Documents or subsequently agreed upon. Additional mark-ups for overhead and profit will not be allowed in Unit Price Work.

§ 7.1.4.1 The Contractor, upon receipt of written notification by the Owner or the Architect of a proposed item of change in the Work, shall prepare within 10 Calendar Days a Change Proposal in such form or forms as directed by the Owner or the Architect.

- .1 Each separate Change Proposal shall be numbered consecutively and shall include all cost related to the proposed Change in the Work, including any disruption or impact on performance.
- .2 The Subcontractor's itemized accounting shall be included with the Change Proposal;

- .3 If a Change Proposal is returned to the Contractor for additional information or if the scope of the proposed Change in the Work is modified by additions, deletions or other revisions, the Contractor shall revise the Change Proposal accordingly and resubmit the revised Change Proposal to the Architect and the Owner;
- .4 A revised Change Proposal shall be the original Change Proposal number suffixed by the letter "R" to designate a revision in the original Change Proposal. If additional revisions to a revised Change Proposal are necessary, each subsequent revision shall be identified by an appropriate numeral suffix immediately following the "R" suffix;
- .5 Upon written approval of a Change Proposal by Owner, the Architect and the Contractor, the Architect will prepare an Allowance Expenditure Authorization or Change Order authorizing such change in the Work; and
- .6 The Contractor shall request extensions of Contract Time due to changes in the Work only at the time of submitting its Change Proposal. Contractor's failure to do so shall represent a waiver of any right to request a Contract Time extension. Any request for extensions of Contract Time must be substantiated through the demonstration of the impact of the proposed item of change in the Work to the critical path schedule for the Project.

**§ 7.1.4.2** Formal Notice of Essence. Contractor recognizes and acknowledges that timely submission of a formal Change Proposal, whether or not the circumstances of the Change may be known to the Owner or available to Owner through other means, is not a mere formality but is of crucial importance to the ability of Owner to promptly identify, prioritize, evaluate and mitigate the potential effects of Changes. Any form of informal notice, whether verbal or written (including, without limitation, statements in Requests for Information, statements at regular job meetings or entries on monthly reports, daily logs or job meeting minutes), that does not strictly comply with the formal requirements of Paragraph 7.1.4.1, above, shall therefore be insufficient.

**§ 7.1.5** In accordance with Texas Education Code §44.0411 if the Contract Sum is \$1,000,000.00 or more, or if the Contract Sum is less than \$1,000,000.00, and any Change Order, Construction Change Directives, or other Changes in the Work would increase the Contract Sum to \$1,000,000.00 or more, the total of all Change Orders, Construction Change Directives, or other Changes in the Work may not increase the Contract Sum by more than 25% of the original Contract Sum. Any Change Order, Construction Change Directive, or other Change in the Work that would exceed that limit is void and of no effect.

## **§ 7.2 Change Orders**

**§ 7.2.1** A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

**§7.2.2** In no event shall a single change, or the aggregate of all changes, result in the total costs, reimbursements and fees exceeding the Contract Sum or be the basis of a change in the Contract Time unless and until such change has been authorized by a Change Order executed and issued by the Owner in accordance with the Contract Documents prior to the commencement of such modified or changed Work. Changes in the Work may be made without notice to Contractor's sureties and absence of such notice shall not relieve such sureties of any of their obligations to Owner.

**§7.2.3** Contractor stipulates that acceptance of a Change Order by the Contractor shall constitute full accord and satisfaction for any and all Claims, whether direct or indirect, including but not limited to, impact or delay damages, arising from the subject matter of the Change Order and attorney's fees and costs arising from a dispute with a Subcontractor or Sub-subcontractor over the Change Order.

**§ 7.2.4** Methods used in determining adjustments to the Contract Sum may include those listed in Section 7.3.3.

## **§ 7.3 Construction Change Directives**

**§ 7.3.1** A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and, if required by the Owner, the Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without

invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

**§ 7.3.2** A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

**§ 7.3.3** If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon (additional mark-ups for overhead, profit and fees will not be allowed);
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee subject to the limitations of Section 7.1; or
- .4 As provided in Section 7.3.4 subject to the limitations of Section 7.1.

**§ 7.3.4** If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall make a recommendation of the amount by which the Contractor's direct costs have actually been increased over the direct cost of performing the Work without the Change in the Work, all subject to the approval of the Owner. The Contractor shall keep and present, in such form as the Architect or Owner may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Actual costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- .2 Actual costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Actual rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others at rates that are no greater than market rates in the locale of the Work at the time of the Work. Unless otherwise established in the Contract, the rental value of the Contractor's own equipment shall not be more than the normal local rental rate for similar equipment;;
- .4 Actual costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change Work, except that sales, use or similar taxes to which the Owner is exempt shall not be included in the calculation of costs; and
- .5 Actual additional costs of supervision and field office personnel directly attributable to the change.

**§ 7.3.5** If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

**§ 7.3.6** Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved regardless of the Contractor's agreement with or disagreement with the adjustment in the Contract Sum or Contract Time or the method for determining them, and shall promptly advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

**§ 7.3.7** A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

**§ 7.3.8** The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost plus the Contractor's allocated percent of profit and overhead as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

**§ 7.3.9** Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs

and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified, which shall be further subject to the Owner's review, modification, approval, or rejection. The Architect's interim determination of cost, as modified and/or approved by the Owner, shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of the Contractor to disagree and assert a Claim in accordance with Article 15.

**§ 7.3.10** When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

#### **§ 7.4 Minor Changes in the Work**

The Architect may, subject to Owner approval, order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum, Allowances, Contingencies or Contract Time, the Contractor shall notify the Architect in writing and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum, Allowances, Contingencies or Contract Time and written instruction from the Architect to proceed, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time. The Owner shall also retain authority to order such minor changes in the Work. The Contractor shall carry out such written orders promptly. Minor changes in the Work shall not include changes that involve the outward appearance of the structure, color schemes, floor plans, building materials, landscaping, or mechanical equipment.

### **ARTICLE 8 TIME**

#### **§ 8.1 Definitions**

**§ 8.1.1** Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

**§ 8.1.2** The date of commencement of the Work is the date established in the Agreement.

**§ 8.1.3** The date of Substantial Completion is the date certified by the Architect and approved by the Owner in accordance with Section 9.8. The date of Final Completion is the date certified by the Architect and Owner in accordance with Section 9.10. Unless otherwise agreed in writing by the Owner, the Contractor agrees that Final Completion shall occur by the date set forth in the Agreement, or by such dates thereafter as may be established in any written extensions granted under Article 8 of the General Conditions.

**§ 8.1.4** The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

#### **§ 8.2 Progress and Completion**

**§ 8.2.1** Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor stipulates that the Contract Time is a reasonable period for performing the Work.

**§ 8.2.2** The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner's approval of such insurance..

**§ 8.2.3** The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

**§ 8.2.4** The Contractor is subject to liquidated damages, as specified in the Agreement, if the Work is not completed by the date of Substantial Completion and/or the date of Final Completion.

#### **§ 8.3 Delays and Extensions of Time**

**§ 8.3.1** If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an authorized employee of either, or of a Separate Contractor; (2) by changes



ordered in the Work; (3) by fire, governmental actions, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's reasonable control which do not arise through the action or inaction of Contractor or its Subcontractor, Sub-subcontractor or suppliers, could not have been reasonably anticipated, and could not have been avoided through the exercise of reasonable care or prudent construction management by the Contractor; (4) by delay authorized in writing by the Owner; or (5) by other causes that the Contractor asserts, and the Architect and Owner determine, justify delay, then the Contract Time may be extended in writing for such reasonable time as the Architect and Owner may determine. The foregoing notwithstanding, the Contractor shall not be entitled to an extension of time for changes in the Work required due to Contractor fault, or which extend beyond the time extension provided in a Change Order. Nothing in this provision will limit the rights of Owner under other provisions of this Contract. Any provision of the Contract Documents to the contrary notwithstanding, it is expressly agreed that the extension of the Contract Time shall be Contractor's sole remedy for any delay unless the same shall have been caused by acts constituting intentional interference by the Owner which materially interfere with Contractor's performance of the Work, and then only to the extent that such acts continue after Contractor's reasonable prior written notice to Owner of such interference.

**§ 8.3.2** Claims relating to time shall be made in accordance with applicable provisions of Article 15. A disagreement concerning time extensions shall not relieve the Contractor from performing the Work required by the Contract Documents and shall not be cause for the Contractor to suspend Work on the Project.

**§ 8.3.3** The Contract does not permit the recovery of damages, including, without limitation, extended home office overhead expenses, general conditions or other consequential damages, by the Contractor for delay or disruption or for extensions of time due to bad weather, acts of God, supply chain issues, or market escalation. Contractor agrees that Contractor shall be fully compensated for all delays solely by an extension of time. Owner's exercise of any of its rights under the Contract Documents, including without limitation, its rights under Article 7, Changes in the Work, regardless of the extent or number of such changes or Owner's exercise of any of its remedies of suspension of the Work or requirement of correction or re-execution of any defective Work, shall not, under any circumstances, be construed as interference with Contractor's performance of the Work and shall not entitle the Contractor to any additional compensation.

**§ 8.3.4** In the event of inexcusable delay by Contractor, Owner may direct that the Work be accelerated by means of overtime, additional crews or additional shifts or re-sequencing of the Work. All such acceleration shall be at no cost to Owner.

**§ 8.3.5** In the event that Contractor does not complete the Work within the Contract Time, then in addition to any other costs and damages (liquidated or otherwise) for which Contractor is responsible, Contractor will provide, at its expense, any bonds required by governmental authorities to enable Owner to secure a Certificate of Occupancy (if required) even though there are items of Work which are incomplete.

**§ 8.3.6** The Contractor's claims related to time shall be made in accordance with applicable provisions of the Contract Documents or they shall be deemed waived.

**§ 8.3.7** Any provision of the Contract Documents to the contrary notwithstanding, it is expressly agreed that the extension of the Contract Time shall be Contractor's sole remedy for any delay unless the same shall have been caused by acts constituting interference by the Owner which interfere with Contractor's performance of the work, and then only to the extent that such acts continue after Contractor's written notice to Owner of such interference. Owner's exercise of any of its rights under the Contract Documents or Owner's exercise of any of its remedies of suspension of the Work or requirement or correction or re-execution of any defective Work shall not, under any circumstances, be construed as interference with Contractor's performance of the Work.

**§ 8.3.8** Concurrent Delays. For purposes of the calculations provided for in this Paragraph 8.3.8, the words "concurrent delay", "concurrently delay" or "occur concurrently" mean the portion of two or more Delays affecting the critical path to Substantial Completion that are overlapping or co-existent. Contractor's right to a Contract Adjustment of the Contract Time (pursuant to Subparagraphs 8.3.8.1, 8.3.8.2 and 8.3.8.3, below) and Contract Price (pursuant to Subparagraphs 8.3.8.4, 8.3.8.5 and 8.3.8.6, below) shall, in the case of concurrent delays, be calculated in accordance with the following:

§ 8.3.8.1 If an Excusable Delay and a Compensable Delay occur concurrently, the maximum extension of the Contract Time shall be the number of Days from the commencement of the first Delay to the cessation of the Delay which ends last.

§ 8.3.8.2 If an Unexcused Delay occurs concurrently with either an Excusable Delay or a Compensable Delay, the maximum extension of the Contract Time shall be the number of Days, if any, by which such Excusable Delay or Compensable Delay exceeds the number of Days of such Unexcused Delay.

§ 8.3.8.3 If an Unexcused Delay occurs concurrently with both an Excusable Delay and a Compensable Delay, the maximum extension of the Contract Time shall be the number of Days, if any, by which such Excusable Delay and Compensable Delay, as determined pursuant to Subparagraph 8.3.8.1, above, exceeds the number of Days of such Unexcused Delay.

§ 8.3.8.4 If an Unexcused Delay occurs concurrently with a Compensable Delay, the maximum period of time for which Contractor shall be entitled to a Change Order to the Contract Price in accordance with the Agreement shall be the number of Days, if any, by which such Compensable Delay exceeds the number of Days of such Unexcused Delay.

§ 8.3.8.5 If a Compensable Delay occurs concurrently with an Excusable Delay, the maximum period of time for which Contractor shall be entitled to a Change Order to the Contract Price in accordance with the Agreement shall be the number of Days, if any, by which such Compensable Delay exceeds the number of Days of such Excusable Delay.

§ 8.3.8.6 If an Unexcused Delay occurs concurrently with both an Excusable Delay and a Compensable Delay, the maximum period of time for which Contractor shall be entitled to a Change Order to the Contract Price in accordance with the Agreement shall be the number of Days, if any, by which such Compensable Delay exceeds the number of Days of such Unexcused Delay.

## § 8.4 Liquidated Damages

§ 8.4.1 The Work to be performed under this Agreement shall be substantially completed by the date set forth in the Agreement, or by such dates thereafter as may be established in any written extensions granted under Article 8 of the General Conditions. The parties hereto agree that time is of the essence of this Contract and in all phases of the Work, and that actual and direct damages would be suffered by the Owner if the Contractor does not substantially or finally complete all Work called for in the Contract Document by the specified dates. Such actual and direct damages are, and will continue to be, impracticable and extremely difficult to determine. Execution of this Agreement under these specifications shall constitute the agreement by Owner and Contractor that the amounts stated herein are the minimum value of the costs and actual and direct damages caused by failure of Contractor to complete the Work within the allotted or agreed extended times of Substantial or Final Completion, that such sums are liquidated direct damages and as all not be constructed to be as a penalty, and that such sums may be deducted from payments due Contractor if such delay occurs. It is therefore expressly agreed, as a part of the consideration inducing the Owner to execute this Contract, that the Owner may deduct from any payment(s) due to the Contractor a sum equal to the amount stated in the Agreement for each and every Calendar Day beyond the date set forth in the Agreement for Substantial Completion or Final Completion of the Work included in the Contract Documents. It is expressly understood that said sum per day is agreed upon as a real, justified, and fair estimate of the pecuniary damages which will be sustained by the Owner in the event that the Work is not substantially or finally completed within the agreed time, or with the legally extended time, if any, otherwise provided for herein. Said sum shall be considered as liquidated damages only, and in no sense shall be considered a penalty or forfeiture, said damage being caused by, but not limited to, additional compensation for personnel, attorneys fees, architectural fees, engineering fees, program management fees, inspection fees, storage costs, food service costs, transportation costs, utilities costs, costs of temporary facilities, loss of interest on money, and other miscellaneous increased costs, all of which are difficult of exact ascertainment. Failure to complete the Work within the designated or agreed extended dates of Substantial or Final Completion, shall be construed as a breach of this Agreement.

§ 8.4.2 Such damages shall be in addition to, and not in lieu of, any other rights or remedies Owner may have against Contractor for failure to timely achieve Final Completion, and damages for failure to achieve Substantial Completion and failure to achieve Final Completion shall run concurrently. If the Work is not finally completed by

the time stated in the Agreement, or as extended, no payments for Work completed beyond that time shall be made until the Project reaches Final Completion.

**§ 8.4.1 Intentionally Deleted.**

**§ 8.4.2** Such damages shall be in addition to, and not in lieu of, any other rights or remedies Owner may have against Contractor for failure to timely achieve Final Completion, and damages for failure to achieve Substantial Completion and failure to achieve Final Completion shall run concurrently. If the Work is not finally completed by the time stated in the Agreement, or as extended, no payments for Work completed beyond that time shall be made until the Project reaches Final Completion.

**ARTICLE 9 PAYMENTS AND COMPLETION**

**§ 9.1 Contract Sum**

**§ 9.1.1** The Contract Sum, or if the Project is a Construction Manager at Risk Project, Guaranteed Maximum Price, is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

**§ 9.1.2** If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices may, by mutual written agreement, be equitably adjusted.

**§ 9.1.3** Notwithstanding anything to the contrary contained in the Contract Documents, the Owner may withhold any payment to the Contractor hereunder if and for so long as the Contractor fails to perform any of its material obligations hereunder or otherwise is in default under any of the provisions of the Contract Documents, subject to the requirements of applicable law.

**§ 9.2 Schedule of Values**

**§ 9.2.1** Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a Schedule of Values to the Architect and the Owner before the first Application for Payment, or in the case of a Guaranteed Maximum Price, within 15 days after establishing the Guaranteed Maximum Price, allocating the entire Contract Sum to the various portions of the Work. The Schedule of Values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect and the Owner. This Schedule, unless objected to by the Architect or Owner, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the Schedule of Values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect or Owner, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment. The Schedule of Values shall be prepared in such a manner that each major item of Work, whether done by Contractor's own forces or subcontracted, is shown as a single line item on AIA Documents G702 and G703, Application and Certificate for Payment. If the Contractor is a Construction Manager at Risk, then the Contractor's fee and general conditions shall be specifically shown, and AIA Documents G732 and G703 shall be used. In addition and for reference rules managing Applications for Payment shall consider Article 5 of the Agreement.

**§ 9.2.2** In order to facilitate the review of Applications for Payment, the Schedule of Values shall be submitted on AIA Documents G702 and G703 (or G732 and G703, as applicable), and shall include the following:

- .1 Contractor's cost for Contractor's fee (if applicable) bonds and insurance, mobilization, general conditions, etc. shall be listed as individual line items.
- .2 Contractor's costs for various construction items shall be detailed, generally categorized by specification section, and further by type of application. For example, concrete work shall be subdivided into footings, grade beams, floor slabs, paving, etc.
- .3 On major subcontracts, such as mechanical, electrical and plumbing, the schedule shall indicate line items and amounts in detail (for example: underground, major equipment, fixtures, installation fixtures, start-up, etc.).
- .4 Costs for subcontract work shall be listed without any additional mark-up of Contractor's costs for overhead, profit or supervision.



- .5 If payment for stored materials is requested prior to installation, then material and labor shall be listed as separate line items.
- .6 Contractor shall provide a report of actual versus projected reimbursable expenses (general conditions), updated monthly.

### § 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors, Sub subcontractors, and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 Contractor agrees that, for purposes of Texas Government Code Sections 2251.021 and 2251.042, receipt of the Application for Payment by the Architect shall not be construed as receipt of an invoice by the Owner. Contractor further agrees that Owner's receipt of the Certificate for Payment from the Architect shall be construed as receipt of an invoice by the Owner, for purposes of Texas Government Code Sections 2251.021 and 2251.042.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor has not been invoiced by a Subcontractor, Sub-subcontractor, or supplier, unless Contractor has self-performed the Work.

§ 9.3.1.3 Until Final Completion of the Work, the Owner shall withhold retainage as provided in the Contract Documents, except that Owner shall not pay amounts for which the Architect refuses to certify payment, or the Owner refuses to pay, as provided herein in Section 9.4.3 or 9.5. The retainage shall be paid with the Final Payment.

§ 9.3.1.4 All progress payment requests shall be accompanied by (i) an itemization of all Subcontractors, Sub subcontractors, and material suppliers, the amounts due each and the amounts to be paid out of said progress payment to each of them and (ii) by unconditional lien waivers releasing all liens and lien rights with respect to Work for which Owner has made payment under a prior progress payment request in a form reasonably satisfactory to Owner from Contractor and all its subcontractors and material suppliers with contracts in excess of \$25,000.00 (Evidence of prior progress payment shall apply to progress payments 61-days or older). When Contractor submits its request for payment of retainage, Contractor shall submit "All Bills Paid" affidavits and unconditional final lien waivers fully releasing all liens and lien rights with respect to the Work in a form reasonably satisfactory to Owner from Contractor and all its Subcontractors, Sub subcontractors, and material suppliers with contracts in excess of \$25,000.00. Applications for Payment shall be certified as correct by Contractor. When requested by Owner or when required by the Davis-Bacon Act, each Application for Payment shall also be accompanied by Certified Payrolls and such other affidavits, certificates, information, data and schedules as Owner may reasonably require. The Owner is not required to make any payment to Contractor to the extent reasonably necessary to protect Owner. In addition to the other requirements of this Article, the initial Application for Payment shall be proceeded or accompanied by the following:

1. List of subcontractors,
2. Schedule of values,
3. Contractor's construction schedule (preliminary if not final),
4. If applicable, Combined Contractor's construction schedule (preliminary if not final) incorporating Work of multiple contracts, with indication of acceptance of schedule by each Contractor,
5. Products list (preliminary if not final),
6. Schedule of unit prices,
7. Submittal schedule (preliminary if not final),
8. List of Contractor's staff assignments,
9. List of Contractor's principal consultants,
10. Copies of building permits,
11. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work,
12. Initial progress report,
13. Report of preconstruction conference,
14. Certificates of insurance and insurance policies,
15. Performance and payment bonds,

16. Data needed to acquire Owner's insurance, and
17. Initial settlement survey and damage report if required

In addition to the other requirements of this Article, each subsequent Application for Payment shall be accompanied by:

1. Updated Microsoft Project schedule meeting the requirements of Section 3.10,
2. Log of Adverse Weather Days, and Instructional Days, including backup documentation,
3. Where Unit Costs are in use, measurements for payments will be made only for actual measured and/or computed length, area, solid contents, number, and weight, unless other provisions are made in the Contract Documents. Payment on a unit price basis will not be made for Work outside finished dimensions shown in the Contract Documents. Include costs for waste, overages and tolerances in the unit price for that line item, and
4. Measurements for unit price quantities will be verified by the Architect/Engineer in conjunction with the General Contractor via inspection of the Work prior to submittal of interim Applications for Payment

**§ 9.3.2** Payments will be made on the basis of invoices for specific materials or equipment incorporated in the Work and specific materials or equipment (1) suitably stored at the site or (2) suitably stored at some off-site location, provided the following conditions are met for off-site storage:

- .1 The location must be agreed to, in writing, by the Owner and Surety.
- .2 The location must be a bonded warehouse.
- .3 The Contractor's Surety must agree, in writing, to the amounts included in each Application for Payment.
- .4 The Contractor must bear the cost of the Owner's and Architect's expenses related to visiting the off-site storage area and reviewing the stored contents. Contractor acknowledges that Architect's time is an additional service and shall compensate Architect directly for same.
- .5 Payment shall not include any charges for overhead or profit on stored materials.
- .6 Payments for materials or equipment stored on or off the site shall be conditioned upon submission by the Contractor of bills of sale or such other procedures satisfactory to the Owner to establish the Owner's title to such materials or equipment or otherwise protect the Owner's interest, including applicable insurance (naming the Owner as insured and naming the specific materials or equipment stored and their location) and transportation to the site for those materials and equipment stored off the site. Under no circumstances will the Owner reimburse the Contractor for down payments, deposits, or other advance payments for materials or equipment until the materials or equipment are delivered to Owner's site. Failure to follow these procedures shall result in nonpayment for storage of or insurance on stored materials and equipment. Failure to follow these procedures shall also result in nonpayment of materials and equipment until said materials and equipment are incorporated into the Work.

**§ 9.3.3** The Contractor warrants that title to all Work, materials, and equipment covered by an Application for Payment will irrevocably pass to the Owner no later than the time of Owner's payment to Contractor of the invoiced cost. Such title shall be free and clear of all liens, claims, security interests or encumbrances. No Work, material or equipment covered by an Application for Payment shall be subject to an agreement under which an interest is retained or an encumbrance is attached by the seller, the Contractor, or other party. The Contractor further warrants that, upon submittal of an Application for Payment, all Work, materials, and equipment for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, Sub-subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work. CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD OWNER HARMLESS FROM AND AGAINST ANY LIENS, CLAIMS, SECURITY INTERESTS OR ENCUMBRANCES FILED BY THE CONTRACTOR, SUBCONTRACTORS, OR ANYONE CLAIMING BY, THROUGH OR UNDER THE CONTRACTOR OR SUBCONTRACTOR FOR WORK, MATERIALS, EQUIPMENT, OR OTHER ITEMS COVERED BY PAYMENTS MADE BY THE OWNER TO CONTRACTOR.

**§ 9.3.4** Contractor shall submit monthly Applications for Payment electronically, or, if requested by Owner, in writing, to both the Architect and Program Manager, if applicable, in quadruplicate using AIA Documents G702 and G703 Application and Certificate of Payment (or G732 and G703, if applicable) and Continuation Sheet. All blanks

in the form must be completed and signatures of Contractor and Notary Public must be original on each form. The Architect and Program Manager, if applicable, may require any additional information deemed necessary and appropriate to substantiate the Application for Payment. Materials that are verified to be on the jobsite or other approved location for use in the Project may also be incorporated into the Application for Payment. Incomplete or inaccurate Applications for Payment shall be returned to the Contractor by the Architect for completion and/or correction. Owner shall have no responsibility for payment of same if the Application for Payment is incomplete or inaccurate.

**§ 9.3.5** By signing each Application for Payment, the Contractor stipulates and certifies to the following: that the information presented is true, correct, accurate and complete; that the Contractor has made the necessary detailed examinations, audits and arithmetic verifications; that the submitted Work has been completed to the extent represented in the Applications for Payment; that the materials, equipment, and supplies identified in the Applications for Payment have been purchased, paid for and received; that the Subcontractors, Sub-subcontractors, and suppliers have been paid as identified in the Applications for Payment or that Contractor has been invoiced for same; that Contractor has made the necessary on-site inspections to confirm the accuracy of the Applications for Payment; that there are no known mechanics' or materialmen's liens outstanding at the date of this requisition; all due and payable bills with respect to the Work have been paid to date or are included in the amount requested in the current application; that, except for such bills not paid but so included, there is no known basis for the filing of any mechanics' or materialmen's liens on the Work; that the Payment Application includes only Work self-performed by Contractor or for which Contractor has been invoiced; and that releases from all Subcontractors, Sub-subcontractors, suppliers, and materialmen have been obtained in such form as to constitute an effective release of lien under the laws of the State of Texas covering all Work performed and for which payment has been made by the Owner to the Contractor. Contractor understands that documents submitted to Owner become government documents under the laws of the State of Texas. Contractor further understands that falsification of Contractor's Application for Payment may constitute a violation of the penal laws of the State of Texas, including, but not limited to, Texas Penal Code Sections 32.46, 37.09, and 37.10, and may justify termination of Contractor's Contract with Owner.

**§ 9.3.6** Contractor's request for payment of the retainage may be made only upon expiration of thirty (30) calendar days after Final Completion. The request shall be accompanied by the Contractor's Affidavit of Payment of Debts and Claims or a comparable affidavit on a form acceptable to Owner. This document must be executed under oath and notarized. Per Tex. Gov't Code Section 2252.032(f), on application to Owner for final payment and release of retainage, Owner may withhold retainage if there is a bona fide dispute between Owner and the Contractor and the reason for the dispute is that labor, services, or materials provided by the Contractor, or by a person under the direction or control of the Contractor, failed to comply with the express terms of the Contract or if the surety on any outstanding surety bond executed for the Contract does not agree to the release of retainage. Owner shall provide to Contractor written notice of the basis on which Owner is withholding retainage under this section.

#### **§ 9.4 Certificates for Payment**

**§ 9.4.1** The Architect and Program Manager, if applicable, will, within seven (7) days after receipt of the Contractor's Application for Payment, either (1) certify, sign and issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) certify, sign and issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner in writing with a detailed statement of the Architect's reasons for withholding certification and disputing in part certification in accordance with Texas Government Code Section 2251.042(a) and as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner in writing with a detailed statement of the Architect's reason for withholding certification in whole in accordance with Texas Government Code Section 2251.042(a) and as provided in Section 9.5.1; or (4) return the Payment Application to the Contractor as provided in Section 9.3.4. Architect's written reason(s) for withholding certification shall be submitted in accordance with, and construed as, the notice required by Texas Government Code Section 2251.042 *et seq.* The Owner shall have the right to reject, modify, or approve the Architect's Certificate for Payment in whole or in part, and shall have the right to make the final determination of the payment to be made to the Contractor. The Owner shall pay the undisputed amounts certified by the Architect and Program Manager, if applicable, to the Contractor within forty-five (45) days of receipt of the Certificate for Payment from the Architect and Program Manager, if applicable, unless otherwise provided in the Contract Documents. Undisputed amounts unpaid after the date on which payment is due shall bear interest pursuant to Texas Government Code Section 2251.025.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed in writing to the Owner by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors, Sub subcontractors, and suppliers and other data unless requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum. Such examinations, audits, and verifications, if required by the Owner, will be performed by the Owner's auditors, accountants or other representatives acting in the sole interest of the Owner. By submitting the Contractor's Applications for Payment, the Contractor is certifying that the information presented is true, correct, accurate and complete; that he has made the necessary detailed examinations, audits and arithmetic verifications; that the submitted Work has been completed to the extent represented in the Applications for Payment; that the materials and supplies identified in the previous Applications for Payment have been purchased, paid for and received; that the subcontractors have been paid as identified in the previous Applications for Payment; and that he has made the necessary on-site inspections to confirm the accuracy of the Applications for Payment; that there are no known mechanic's or material men's liens outstanding at the date of requisition; that all due and payable bills with respect to the Work have been paid to date or are included in the amount requested in the current application; that except for such bills not paid but so included, there is no known basis for the filing of mechanic's or material men's liens; and that releases from all subcontractors and material men have been obtained in such form as to constitute an effective release of lien under the laws of the State of Texas causing all Work performed and for which payment has been made by the Owner to the Contractor. In certifying the Contractor's Applications for Payment, the Architect represents that he has observed the progress of the Work, critically evaluated, reviewed and certified that the amounts requested are valid and correct. The issuance of a certificate for payment shall not be a representation by the Architect that the Architect has made exhaustive or continuous on-site inspections or that the Architect has made examinations to ascertain how or for what purposes the Contractor has used amounts previously paid on account of the Contract. Such examinations, audits and verifications, if required by the Owner, will be performed by the Owner's accountants or other representatives of the Owner acting in the sole interest of the Owner. The Contractor acknowledges that the Owner may authorize minor changes to the work and that those minor changes may be funded in full or in part from contingencies or allowances which are represented in Applications for Payment and supporting documents. The Owner will rely upon the accuracy of the Application for Payment and supporting documentation furnished by the Contractor in authorizing minor changes and expenditures against Allowances. Therefore, the Contractor agrees that any arithmetic error made by the Contractor in any Application for Payment and supporting documents such as contingency logs or allowance balances shall not create an obligation on the part of the Owner to pay additional sums to correct previously approved Applications for Payment. **CONTRACTOR SHALL INDEMNIFY AND HOLD OWNER HARMLESS FROM ANY LIENS, CLAIMS, SECURITY INTERESTS OR ENCUMBRANCES FILED BY THE CONTRACTOR, SUBCONTRACTORS, OR ANYONE CLAIMING BY, THROUGH OR UNDER THE CONTRACTOR OR SUBCONTRACTOR FOR ITEMS COVERED BY PAYMENTS MADE BY THE OWNER TO CONTRACTOR.**

§ 9.4.3 The issuance of a Certificate for Payment shall constitute a recommendation to the Owner regarding the amount to be paid and shall be a prerequisite to any payment being made by the Owner to the Contractor. The Certificate of Payment is not binding on the Owner, and the Owner may rely on other provisions of the Contract Documents, as well as the Architect's Certificate, and on other information known to the Owner to determine the amount to be paid to or withheld from the Contractor.

## § 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to



make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including, but not limited to, loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors, Sub subcontractors, or suppliers for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;
- .7 failure to carry out the Work in accordance with the Contract Documents;
- .8 failure to submit a written plan indicating action by the Contractor to regain the time schedule for completion of Work within the Contract Time; or
- .9 failure to provide any submittals or documentation required under the Contract Documents in a timely manner, including a schedule of values and a construction schedule.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 Notwithstanding any provision contained within this Article, if the Work has not attained Substantial Completion or Final Completion by the required dates, subject to extensions of time allowed under these General Conditions, then Architect may withhold any further Certificate for Payment to Contractor to the extent necessary to preserve sufficient funds to complete the construction of the Project and to cover liquidated damages. The Owner shall not be deemed to be in breach of the Contract Documents by reason of the withholding of any payment which Owner is entitled to withhold pursuant to any provision of the Contract Documents or withholding in reliance on any such Contract Document provision in good faith, or withholding, in good faith, in reliance on information that has come to the attention of the Owner that Owner reasonably believes constitutes sufficient reason to withhold payment, and no interest shall accrue in connection with the withheld payment(s) determined to have been properly withheld.

§ 9.5.5 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

## § 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment for undisputed amounts, the Owner shall review the Application for Payment and the Architect's Certificate and shall make payment or withhold payment in the manner and within the time provided in the Contract Documents, and shall notify Contractor within 21 days if Owner disputes the Architect's Certificate for Payment, pursuant to Texas Government Code Section 2251.042 et seq, listing the specific reasons for nonpayment. Payments to the Contractor shall not be construed as releasing the Contractor or his Surety from any obligations under the Contract Documents..

§ 9.6.2 The Contractor will receive the payments made by Owner and will hold such payments in trust to be applied first to the payment of Subcontractors, Sub-subcontractors, suppliers and any other parties furnishing labor, materials, equipment or services for the Work in accordance with the provisions of their subcontracts. The Contractor shall pay each Subcontractor, Sub-subcontractor, and supplier, no later than seven days after receipt of payment from the Owner and before using any part of the payment from the Owner for any other purpose, the amount to which such party is entitled, reflecting percentages actually retained from payments to the Contractor on

account of such party's portion of the Work, and shall, if requested, provide the Owner with evidence of such payment. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner, and if the Owner so requests, shall provide to the Owner copies of such Subcontractor payments. If the Contractor has failed to make payment promptly to the Contractor's Subcontractors, Sub-subcontractor, or for materials or labor used in the Work for which the Owner has made payment to the Contractor, the Owner shall be entitled to withhold payment to the Contractor, in part or in whole, to the extent necessary to protect the Owner. This Section is subject to the provisions of Texas Business and Commerce Code Chapter 56, as applicable to Owner.

**§ 9.6.3** The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

**§ 9.6.4** The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. The Owner shall have the right at all times to contact Subcontractors, Sub-subcontractors, and material and equipment suppliers to ascertain whether they have been properly paid. Progress payments may, in the discretion of Owner, be made in the form of checks payable jointly to the Contractor and such parties. In the event Owner receives any notices of non-payment from parties furnishing labor, materials, equipment or services for the Work, progress payments and/or Final Payment may, in the discretion of Owner, be made in the form of checks payable jointly to the Contractor and such parties for such amounts as the Contractor agrees or the Owner determines are due. Notwithstanding any other provision in the Contract Documents, neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor Sub-subcontractor or supplier. Action on the part of the Owner to require Contractor to pay a Subcontractor, Sub-subcontractor, or supplier shall not impose any liability on Owner.

**§ 9.6.5** The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

**§ 9.6.6** A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

**§ 9.6.7** The Contractor shall, as a condition precedent to any obligation of the Owner under the Contract, provide to the Owner payment and performance bonds in the full penal amount of the Contract in accordance with the terms and provisions of the Contract Documents, including Article 11 herein, and in accordance with Texas Government Code Chapter 2253. Payments received by the Contractor from the Owner for Work properly performed by Subcontractors, Sub-subcontractors, or provided by suppliers shall be held in trust by the Contractor for the benefit of those Subcontractors, Sub-subcontractors, or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner.

**§ 9.6.8** Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner may notify the Contractor. The Contractor acknowledges that no lien rights exist with respect to public property.

**§ 9.6.9** Contractor shall not withhold as a retainage a greater percentage from Subcontractors or materialmen than the percentage that Owner withheld as retainage from payments to Contractor.

## **§ 9.7 Failure of Payment**

**§ 9.7.1** Pursuant to Texas Government Code Section 2251.051, if the Owner does not pay the Contractor any payment certified by the Architect, which is undisputed, due and owing after the date the payment is due under the Contract Documents, then the Contractor may, upon ten (10) additional days' notice to the Owner and Architect that payment has not been made and the Contractor intends to suspend performance for nonpayment, may, subject to applicable law, stop the Work until payment of the undisputed amount owing has been received. If the Owner provides written notice to the Contractor that: 1) payment has been made; or 2) a bona fide dispute for payment exists, listing the specific reasons for nonpayment, then Contractor shall be liable for damages resulting from suspension of the Work. If a reason specified is that labor, services, or materials provided by the Contractor are not

provided in compliance with the Contract Documents, then the Contractor shall be provided a reasonable opportunity to cure the noncompliance or to compensate Owner for any failure to cure the noncompliance. No amount shall be added to the Contract Sum as a result of a dispute between Owner and Contractor unless and until such dispute is resolved in Contractor's favor.

**§ 9.7.2** If the Architect does not issue a Certificate for Payment within seven (7) days after receipt of the Contractor's Application for Payment, through no fault of the Contractor, then the Contractor shall provide written notice to the Owner, and the Owner shall have fourteen (14) Business Days after receipt of such notice to provide or obtain a Certificate for Payment. If Owner fails to provide or obtain the Certificate for Payment, then the Contractor may, upon fourteen (14) additional Business Days' written notice to the Owner and Architect, stop the Work until payment of the undisputed amount owing has been received.

**§ 9.7.3** If the Owner is entitled to reimbursement or payment from the Contractor under or pursuant to the Contract Documents, such payment shall be made promptly upon demand by the Owner. Notwithstanding anything contained in the Contract Documents to the contrary, if the Contractor fails to promptly make any payment due to Owner, pursuant to the Contract, or the Owner incurs any costs or expenses to cure any default of the Contractor or to correct defective Work, then the Owner shall have an absolute right to offset such amount against the Contract Sum and may, in the Owner's sole discretion and without waiving any other remedies, elect either to:

- .1 deduct an amount equal to that to which the Owner is entitled from any payment then or thereafter due to Contractor from the Owner; or
- .2 issue a written notice to the Contractor reducing the Contract Sum by an amount equal to that to which the Owner is entitled.

## **§ 9.8 Substantial Completion**

**§ 9.8.1** Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use; all Project systems included in the Work or designated portion thereof have been successfully tested and are fully operational; system demonstrations have been performed; and a certificate of occupancy shall have been issued before Substantial Completion can be achieved. The Work will not be considered suitable for Substantial Completion review until all required governmental inspections and certifications required of the Work have been made, approved, and posted; designated initial demonstration and instruction of Owner's personnel in the operation of Project systems has been completed; all final finishes set out within the Contract Documents are in place as required by the Specifications, and there shall have been a completion of and acceptance by Owner of all major punch-list items and a majority of minor items are of a cosmetic nature, so that the Owner could occupy or otherwise utilize the Project on that date and the completion of the Work by the Contractor would not materially interfere or hamper the Owner's (or those claiming by, through or under the Owner) normal business operations. All work that could interfere with the Owner's use following Substantial Completion shall be performed by the Contractor after hours at no additional expense to the Owner. As a further condition of Substantial Completion acceptance, the Contractor shall certify that all remaining Work will be completed within ninety (90) consecutive calendar days following the date of Substantial Completion. In the event Substantial Completion is not achieved by the designated date, or as it may be extended, Owner may withhold payment of any further sums due until Substantial Completion is achieved. Owner shall also be entitled to deduct out of any sums due to Contractor any or all Liquidated Damages due Owner in accordance with the Contract Documents. In addition to the requirements of the Contract Documents, it is expressly understood that the establishment of Substantial Completion is subject to the following:

1. All major systems necessary to cause the facility to be used for its intended use.
2. All fire alarm system components must be completed and demonstrated to the Owner.
3. Local fire marshal approval certificate must be delivered to the Owner.
4. All HVAC air and water balancing must be complete.
5. All Energy Management Systems must be complete and fully operational and demonstrated to the Owner.
6. All school communications equipment and telephone systems must be complete and demonstrated to the Owner.
7. All final lockset cores and keys must be installed, and labeled with a bitting list.
8. All room plaques and exterior signage must be complete.
9. All Owner demonstrations and training must be completed, including kitchen equipment, HVAC equipment, plumbing equipment, and electrical equipment.
10. All exterior clean-up and landscaping must be complete.

11. All final interior clean-up must be complete.
12. A final Certificate of Occupancy conforming to the requirements of the location jurisdictional authority must be signed by the Contractor and delivered to the Owner.
13. All operation and maintenance manuals must be submitted to the Architect, approved by the Architect, and delivered to the Owner.
14. Temporary facilities and utility services have been removed
15. Flood elevation certificate furnished and accepted by all authorities having jurisdiction, including but not limited to the County in which the Project is located.
16. [Note to editor: Omit this requirement if not needed for Jurisdiction] Windstorm (WPI-8) certificate furnished and accepted by all authorities having jurisdiction, including but not limited to the County in which the Project is located.

**§ 9.8.2** When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall, using the Owner's Project Management Software, prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to Final Payment. The punch list shall contain an area or room description, and a photograph of each deficiency listed in the punch list and a space for contractor and architect to individually indicate the date of the correction and observation of the correction, respectively. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. The Architect and/or Owner shall have the right to add additional items to be completed or corrected to the comprehensive list submitted by the Contractor.

**§ 9.8.2.1** The Contractor's Project Manager or superintendent shall participate in the preparation of the Contractor's punch list that is submitted to the Architect and Owner for supplementation. Upon receipt, the Architect shall perform a spot review to determine the adequacy and completeness of the Contractor's punch list. Should the Architect determine that the Contractor's punch list lacks sufficient detail or requires extensive supplementation, the punch list will be returned to the Contractor for further inspection and revision. The date of Substantial Completion will be delayed until the punch list submitted is a reasonable representation of the Work to be done.

**§ 9.8.2.2** Upon receipt of an acceptable Contractor's punch list, the Contractor's Superintendent or Project Manager shall accompany the Architect, his Consultants and the Owner (at his discretion) during their inspections and the preparation of verbal or written additions to the Contractor's punch list. The Contractor's Project Manager or Superintendent shall record or otherwise take notes of all supplementary items and incorporate into the Final Punch List. A typed addition to the supplements to the punch list will be made by the Contractor. This procedure will produce a Final Punch List that has the Contractor's, Architect's, Consultant's and Owner's comments incorporated in only one list using the Owner's Project Management Software. Delay in the preparation of the Final Punch List shall not be cause for a claim for additional cost or extension of time as the Contractor's superintendent shall have been in attendance during the inspections of the Architect and its consultants and will have been expected to have taken appropriate own notes.

**§ 9.8.2.3** The Contractor's Project Manager or Superintendent shall have been in attendance during the inspections of the Architect and his Consultants and will have been expected to take his own notes for addition to the Final Punch List.

**§ 9.8.3** Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, then the Architect shall so notify the Contractor and Owner in writing, and the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect or Owner. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion. Architect is obligated under the agreement between Owner and Architect to make only a limited number of site visits to determine dates of Substantial Completion. Any fee which Owner incurs for additional site visits of Architect for determination of Substantial Completion will be at the expense of Contractor. Owner will deduct amount of Architect's compensation for re-inspection services from Final Payment or, at the Owner's discretion, may require the Contractor to reimburse the Owner for such costs directly.



**§ 9.8.4** When the Work or designated portion thereof is substantially complete, the Architect will prepare, sign, and issue to Owner a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the Final Punch List accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

**§ 9.8.5** The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate.

**§ 9.8.5.1** After the date of Substantial Completion of the Project as evidenced by the Certificate of Substantial Completion, the work to correct all deficiencies contained in the punch list attached to the Certificate of Substantial Completion shall be completed by the date set forth in the Agreement, or by such dates thereafter as may be established in any written extensions granted under Article 8 of the General Conditions. Failure by the Contractor to complete such corrections within the stipulated time will be reported to the Contractor's surety. In the report of deficiency the Contractor and surety will be informed that, should correction remain incomplete for ninety (90) additional days, the Owner will initiate action to complete corrective work out of the remaining contract funds in accordance with Article 14.2. Additional costs of the Owner, Architect, and other consultants incurred because of the Contractor's failure to complete the correction of deficiencies by the date set forth in the Agreement, or by such dates thereafter as may be established in any written extensions granted under Article 8 of the General Conditions, will be deducted from the funds remaining to be paid to the Contractor. Should corrective work following Substantial Completion require more than one re-inspection after notification by the Contractor that corrections are complete; the cost of subsequent inspections shall also be deducted from funds remaining unpaid to the Contractor.

**§ 9.8.5.2** The issuance of a Partial Certificate of Substantial Completion shall not relieve the Contractor from the obligation to obtain Substantial Completion for the portions of the project not included in the Partial Certificate of Substantial Completion by the dates indicated in this Agreement. The issuance of a Partial Certificate of Substantial Completion shall not relieve the Contractor from the assessment of liquidated damages for the portions of the project not included in the Partial Certificate of Substantial Completion by the dates indicated in this Agreement.

**§ 9.8.6** Retainage is not due to the Contractor until thirty-one (31) days after Final Completion of the Work as set out in Section 9.10. After the Certificate of Substantial Completion is accepted by the Owner, the Owner may, at its sole discretion and upon acceptance and consent of surety, make payment of retainage on all or a part of the Work accepted. Final Completion includes submittal of all required closeout and record documents. The Contractor's request for retainage payment shall be accompanied by the Contractor's Affidavit of Payment of Debts and Claims or a comparable affidavit on a form acceptable to Owner. This document must be executed under oath and notarized.

## **§ 9.9 Partial Occupancy or Use**

**§ 9.9.1** The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer, if such consent is necessary, and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided that the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect and Owner as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect or Owner. Contractor agrees that the Owner may place and install as much equipment and furnishings as is possible before completion or partial completion of portions of the Work.

**§ 9.9.2** Immediately prior to such partial occupancy, use, or installation, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

**§ 9.9.3** Unless otherwise agreed upon in writing, partial occupancy or use of a portion or portions of the Work or installation of furnishings and equipment shall not constitute acceptance of Work not complying with the requirements of the Contract Documents nor shall it constitute evidence of Substantial Completion or Final Completion.

**§ 9.9.4** In the event that Owner takes partial occupancy or installs furnishings and equipment prior to Substantial Completion of the Project, Contractor shall obtain an endorsement to Contractor's Builder's Risk Policy to provide extended coverage for partial occupancy if the Contractor's Builder's Risk Coverage required by Article 11 would not otherwise provide such coverage.

**§ 9.9.5** Non-Triggering of Substantial Completion by Owner Occupancy: The parties expressly acknowledge and agree that any occupancy or use of the Project, or any portion thereof, by the Owner prior to formal acknowledgment of Substantial Completion as defined in the Contract Documents does not constitute or imply the attainment of Substantial Completion. Any necessity or decision by the Owner to occupy the Project, or any portion thereof, prior to the Contractor's full completion of all contractual obligations does not accelerate or alter the Contractor's duties or the standards for Substantial Completion. The Contractor remains fully obligated to achieve Substantial Completion according to the terms set forth in the Contract Documents, irrespective of any such early occupancy or use by the Owner. The Owner's occupancy, whether full or partial, will not trigger or cause Substantial Completion or affect any rights or obligations that arise upon Substantial Completion, including but not limited to, commencement of any warranties or guarantees, or the period for final completion.

## **§ 9.10 Final Completion and Final Payment**

**§ 9.10.1** When all of the Work is finally completed and all required documentation has been submitted, and the Contractor is ready for a final inspection, it shall notify the Owner and the Architect thereof in writing. Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Contractor shall issue its final Application for Payment. Upon the Architect's agreement and approval, the Architect will promptly prepare, sign, and issue a Owner's Certificate of Final Completion and final Certificate for Payment certifying to the Owner that best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance, including all retainage, found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled. Owner may rely on other provisions of the Contract Documents, as well as the Architect's certifications, in determining the payment to be made to Contractor. Final Payment shall be made by the Owner in accordance with Owner's regular schedule for payments. The Architect is obligated under the agreement between Owner and Architect to make only a limited number of site visits to determine Final Completion. Any fee which Owner incurs for additional site visits of Architect for determination of Final Completion will be at the expense of Contractor. Owner will deduct amount of Architect's compensation for re-inspection services from final payment or, at the Owner's discretion, may require the Contractor to reimburse the Owner for such costs directly.

**§ 9.10.2** Neither Final Payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) using AIA Document G706, an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) evidence satisfactory to Owner that insurance required by the Contract Documents to remain in force after Final Payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) using AIA Document G707, Consent of Surety, if any, to Final Payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) except for amounts currently withheld by the Owner, other data establishing payment or satisfaction of obligations, such as AIA Document G706A, notarized subcontractor lien releases, and other receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract or the Work, to the extent and in such form as may be designated by the Owner. If a Subcontractor, Sub-subcontractor, or supplier refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall

refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees. In addition, the following items must be completed and received by the Owner before Final Payment will be due:

- .1 Written certifications required by Sections 10.5, 10.6, and 10.7.
- .2 Final List of Subcontractors (AIA Document G705);
- .3 Contractor's certificate(s) required by 19 Tex. Admin. Code 61.1036-61.1040, as applicable;
- .4 Contractor's and other required warranties, organized as required elsewhere in the Contract Documents;
- .5 Maintenance and Instruction Manuals;
- .6 Owner's Final Completion Certificate; and
- .7 Record drawings and "as built" drawings as required elsewhere in the Contract Documents.

Documents identified as affidavits must be notarized. All manuals will contain an index listing the information submitted. The index section will be divided and identified by tabbing each section as listed in the index. Upon request, the Architect will furnish the Contractor with blank copies of the forms listed above. Final Payment shall be paid by the Owner to the Contractor within thirty (30) days after Owner's Board of Trustees has voted to accept the Work and approve Final Payment, unless otherwise delegated.

Owner, Architect, Contractor, and prime subcontractors, if applicable, shall certify compliance with all applicable school facility standards required in 19 TAC Section 61.1040 subsections (d) and (g)-(k). 19 TAC Section 61.1040(f).

Per 19 TAC Section 61.1040(6)(f)(C), Contractor shall certify the following:

- (i) Process certifications. To ensure construction quality and performance of contract terms, the Contractor and prime subcontractors, if applicable, shall certify compliance that the Project has been built in conformance with the contract documents.
- (ii) Certifications related to construction quality standards under subsection (j) of 19 TAC Section 61.1040.

To ensure compliance with construction quality standards, the Contractor and prime subcontractors, if applicable, shall certify compliance at the completion of a capital improvement project that the Project has been built in conformance with the contract terms and performance standards specified by the Contract Documents for the Contractor and for any of its subcontractors or subconsultants of any tier, which shall include certification of compliance with any subsequent change order documents approved by the Owner and Architect.

Where a third-party code compliance officer is required by subsection (j) of 19 TAC Section 61.1040 to ensure that a third-party code compliance officer does not find any violations of the provisions of the required construction codes identified in subsection (j)(1) of 19 TAC Section 61.1040 that are not enforced by a state or local authority having jurisdiction, Owner shall require that a third-party code compliance officer issue a third-party certificate of occupancy. Where a local authority having jurisdiction enforces some of the required construction codes, a third-party code compliance officer shall not issue a third-party certificate of occupancy until either the local authority having jurisdiction has issued a certificate of occupancy or the local authority having jurisdiction indicates in writing to the third-party code compliance officer that the local authority having jurisdiction does not issue certificates of occupancy.

Certifications related to safety and security standards under subsection (k) of 19 TAC Section 61.1040. To provide a safe and secure environment, the Contractor and prime subcontractors, if applicable, shall certify compliance that the Project has been built in reasonable accordance with the safety and security directives provided by the school district and reflected in the Contract Documents prepared by the Architect.

Special provisions for a Construction Manager-Agent. For projects that use the construction manager agent contracting method established in Texas Government Code Chapter 2269, Subchapter E, the Construction Manager Agent and each construction prime contractor must provide certification in accordance with clause (i) of 19 TAC Section 61.1040, and each shall certify the scope of work for which they are contractually responsible.

**§ 9.10.3** If, after Substantial Completion of the Work, Final Completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting Final Completion, and the Architect so confirms,

the Owner shall, upon application by the Contractor and certification by the Architect and, if necessary, written consent of the surety, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted, less retainage. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing Final Payment, except that it shall not constitute a waiver of Claims by Owner. Nothing in this subsection is intended to limit or reduce Owner's rights and remedies in the event of a Contractor default.

**§ 9.10.4** The making of Final Payment shall not constitute a waiver of Claims by the Owner.

**§ 9.10.5** Acceptance of Final Payment by the Contractor, a Subcontractor, Sub-subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously asserted pursuant to Article 15 made in writing and identified by that payee as unsettled at the time of final Application for Payment.

## **ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY**

### **§ 10.1 Safety Precautions and Programs**

**§ 10.1.1** The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract and shall conform to all provisions of the "Manual of Accident Prevention in Construction", published by the Associated General Contractors of America, Inc., latest edition, and the Contractor further agrees to fully comply with all safety standards required by the Occupational Safety and Health Administration ("OSHA") 29 USC Section 651 et seq., and all amendments thereto. However, the Contractor's performance of its obligations under Article 10 shall not relieve any Subcontractor, Sub-subcontractor, supplier, or any other person or entity, of their responsibilities for the safety of persons and property and for compliance with all applicable federal, state and local laws, rules, regulations, and ordinances, nor shall any such party be relieved from the obligation to provide for the safety of their employees, persons and property and their requirements to maintain a work environment free of recognized hazards.

**§ 10.1.2** Contractor's employees, agents, Subcontractors, Sub-subcontractors, suppliers or anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, shall not perform any service for Owner while under the influence of any amount of alcohol or any controlled substance, or use, possess, distribute, or sell alcoholic beverages while on Owner's premises. No person shall use, possess, distribute, or sell illicit or unprescribed controlled drugs or drug paraphernalia; misuse legitimate prescription drugs; or act in contravention of warnings on medications while performing the Work or on Owner's premises.

**§ 10.1.3** Contractor has adopted or will adopt its own policy to assure a drug-free and alcohol-free workplace while on Owner's premises or performing the Work. Contractor will remove any of its employees, agents, Subcontractors, Sub-subcontractors, suppliers, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, from performing the Work any time there is suspicion of alcohol and/or drug use, possession, or impairment involving such person, and at any time an incident occurs where drug or alcohol use could have been a contributing factor. Owner has the right to require Contractor to remove any person from performing the Work any time cause exists to suspect alcohol or drug use. In such cases, the person so removed may only be considered for return to work after the Contractor certifies as a result of a for-cause test, conducted immediately following removal that said person was in compliance with this Contract. Contractor will not use any person to perform the Work who fails or refuses to take, or tests positive on, any for-cause alcohol or drug test.

### **§ 10.2 Safety of Persons and Property**

**§ 10.2.1** The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- .1 employees on the Work, school personnel, students, and other persons on or off Owner's premises who may be affected thereby, including the installation of fencing between the Work site and the occupied portion of a connecting or adjacent educational or other facility;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, a Sub-subcontractor, or a supplier; and

- .3 other property at the site or adjacent thereto, such as other buildings and their contents, fencing, trees, shrubs, lawns, walks, athletic fields, facilities and tracks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

The Contractor shall also do all things necessary to protect the Owner's premises and all persons from damage and injury, when all or a portion of the Work is suspended for any reason. Contractor's obligations under Section 10.2 as to each portion of the Project shall continue until Owner takes full possession of and occupies that portion of the Project.

**§ 10.2.2** The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss. The Contractor shall promptly report in writing to the Owner and Architect all accidents arising out of or in connection with the Work which cause death, bodily injury, or property damage, giving full details and statements of any witnesses. In addition, if death, serious bodily injuries, or serious property damages are caused, the accident shall be reported immediately by telephone or messenger to the Owner and the Architect.

**§ 10.2.3** The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including installing fencing, posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards. The Contractor shall also be responsible, at the Contractor's sole cost and expense, for all measures necessary to protect any property adjacent to the Project and improvements therein. Any damage to such property or improvements shall be promptly repaired by the Contractor. Contractor shall provide reasonable fall protection safeguards and provide approved fall protection safety equipment for use by all exposed Contractor employees.

**§ 10.2.4** When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel and shall only conduct such activities after giving reasonable advance written notice of the presence or use of such materials, equipment or methods to Owner and Architect. The storage of explosives on Owner's property is prohibited. The use of explosive materials on Owner's property is prohibited unless expressly approved in advance in writing by Owner and Architect..

**§ 10.2.5** The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

**§ 10.2.6** The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

**§ 10.2.7** The Contractor shall not load or permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

**§ 10.2.8** The Contractor shall be responsible for taking all precautions necessary to protect the Work in place from any foreseeable weather conditions which could cause any potential damage to portions or all Work in place or to other portions of the Project. The Contractor shall be responsible for performing all repairs and/or replacement of any Work that results from foreseeable weather conditions, and shall also be responsible for all repairs and/or replacement of any other portions of the Project to the extent such repairs and/or replacement are required as a result of Contractor's failure to properly secure the Work or otherwise take precautions with respect to the Work as required under this Section 10.2.8.



### **§ 10.2.9 Injury or Damage to Person or Property**

If either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts and omissions such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding twenty-one (21) days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter. Provided, however, Contractor understands that, under Texas law, Owner has tort immunity.

**§ 10.2.10** The performance of the foregoing services shall not relieve the Subcontractors of their responsibilities for the safety of persons and property and for compliance with all applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to the conduct of the Work.

**§ 10.2.11** The Contractor shall be responsible for taking all precautions necessary to protect the Work in place from any foreseeable weather conditions which could cause any potential damage to portions or all Work in place. The Contractor shall be responsible for performing all repairs and/or replacement of any Work that results from foreseeable weather conditions.

### **§ 10.3 Hazardous Materials and Substances**

**§ 10.3.1** The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition. The Contractor shall have no responsibility to initially discover the presence of such hazardous materials on the project site, but shall have an affirmative duty to immediately report to the Owner the existence of such materials actually known by the Contractor or the Contractor's consultants to be present on the project site. Provided, however, that these limitations shall not apply if the Contractor places or allows such hazardous materials to be placed on the Project site. If Contractor encounters polychlorinated biphenyl (PCB), and the specifications require the PCB's removal, the Contractor shall remove the PCB and store it in marked containers at the jobsite provided by the Owner. If PCBs are found which are leaking, then Contractor shall stop work on the affected fixture and shall contact Owner for removal and disposal of the leaking PCBs.

**§ 10.3.2** Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume within a reasonable time to be determined upon written agreement of the Owner and Contractor. The Contractor may be entitled to an equitable adjustment regarding the Date of Substantial Completion and/or Final Completion to the extent of any delay directly attributable to efforts to remove or safely contain a material or substance as required hereunder.

**§ 10.3.3** IF CONTRACTOR IMPORTS HAZARDOUS MATERIALS ONTO THE PROJECT SITE, THEN CONTRACTOR HEREBY AGREES TO DEFEND, INDEMNIFY AND HOLD HARMLESS THE OWNER, ITS CONSULTANTS, TRUSTEES, OFFICERS, AGENTS AND EMPLOYEES, AGAINST ANY CLAIMS ARISING OUT OF OR RELATED TO SUCH IMPORTATION, INCLUDING BUT NOT LIMITED TO COSTS AND EXPENSES THE OWNER INCURS FOR REMEDIATION OF A MATERIAL OR SUBSTANCE THE CONTRACTOR BRINGS TO THE SITE, AS PROVIDED FOR IN SECTION 3.18.

**§ 10.3.4** The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The

Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

**§ 10.3.5** The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

**§ 10.3.6** If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all actual cost and expense thereby incurred.

#### **§ 10.4 Emergencies**

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

#### **§ 10.5 Materials Containing Asbestos, Lead or PCB's**

**§ 10.5.1** As part of submittals under the section in the Project Manual related to Contract Closeout, and prior to Final Payment and payment of retainage, the Contractor and, as applicable, each Subcontractor, Sub-subcontractor and supplier shall submit all applicable Safety Data Sheets (SDS) and a notarized statement on company or other official letterhead certifying to the best of their information, knowledge and belief, that no lead, asbestos, asbestos-containing (or, under reasonably foreseeable conditions, releasing) materials or PCBs in excess of amounts allowed by Local/State standards, laws, codes, rules and regulations; the Federal Environmental Protection Agency (EPA) standards and/or the Federal Occupational Safety and Health Administration (OSHA) standards, whichever is most restrictive, have been used or incorporated into the Work, and lead or lead-bearing (or, under reasonably foreseeable conditions, releasing) materials have not been incorporated into potable water systems. As used in this statement, the term "potable water systems" shall include, without limitation, those water systems for drinking fountains, all sinks, showers, bath tubs, residential and commercial kitchen equipment, ice machines, and hose bibs, as applicable to the Project. The notarized statement shall further state that, should any such materials be found in any of the Work in contravention of the notarized statement, then Contractor shall be responsible for taking all necessary corrective action to remove those materials from the Work, at no additional cost to the Owner. The notarized statement shall be dated, shall reference this specific Project, and shall be signed by not less than two (2) officers of the Contractor or the applicable Subcontractor, Sub-subcontractor, or supplier.

**§ 10.5.2** To the best knowledge of the Owner, the Architect and his consultants, no products or materials containing asbestos or polychlorinated biphenyl (PCB) or other toxic substances have been specified for this Project. In the event the Contractor, its Subcontractors, Sub-subcontractors, or suppliers become aware that any products or materials specified, ordered, scheduled for or already incorporated in the Work on this Project, contain any hazardous material, whether stated in the Contract Documents or not, the situation shall be reported immediately to the Owner and Architect in writing. An acceptable, equal substitute for the product or material in question shall be proposed by the Contractor, and the product or material in question, if already onsite or incorporated in the Work, shall be removed from the site immediately and returned to the supplier or manufacturer.

**§ 10.5.3** Final Payment and payment of retainage shall not be made until the information and notarized statements required under Section 10.5 have been received by Owner.

### **ARTICLE 11 INSURANCE AND BONDS**

#### **§ 11.1 Contractor's Insurance and Bonds**

**§ 11.1.1** The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, its trustees, officers, employees, agents, and representatives, Architect, and Architect's consultants, the Program Manager, if applicable, shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 **Notice of Cancellation or Expiration of Contractor's Required Insurance.** Without limiting or waiving Owner's right to earlier notice of any modification, termination, or expiration of insurance coverages as provided in the Contract Documents, immediately upon the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation, expiration, or other lapse,. Upon receipt of written notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

## § 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner shall be responsible for purchasing and maintaining property and casualty insurance no later than the date of Substantial Completion and such dates of Owner responsibility shall be documented in the Certificate of Substantial Completion. If Owner occupies or uses any completed or partially-completed portion of the Work at any stage, then such occupancy or use must be consented to by the insurer and authorized by public authorities having jurisdiction over the Work. To the extent of overlap between Owner's property insurance and Contractor's builder's risk insurance, if any, Contractor's builder's risk shall be primary and non-contributory.

## ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

### § 12.1 Uncovering of Work

§ 12.1.1 If the Contract Documents specify, or the Architect or Owner requests, that certain Work shall not be covered until the Architect has had an opportunity to examine such Work, the Contractor shall notify the Architect in writing a minimum of 48 hours prior to covering up any such Work in progress in order for the Architect to make proper field observations of the Work in place. The Contractor shall place no concrete, fill-in ditches, or cover up walls or ceilings without first contacting the Architect as noted above and receiving approval. If a portion of the Work is covered contrary to the Architect's or Owner's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect or Owner, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered and the Contract Documents do not specify otherwise and the Architect or Owner has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor may be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate for the actual cost to uncover and replace such Work. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, and replacement, shall be at the Contractor's expense.

### § 12.2 Correction of Work

#### § 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense. The Owner may make emergency repairs to the Work or take such other



measures necessary under the circumstances, if the Contractor does not promptly respond to a notice of defect or nonconforming Work. Contractor shall be responsible to Owner for this cost if the reason for the repairs is attributable to the Contractor. If payments then or thereafter due to the Contractor are not sufficient to cover such costs, then the Contractor shall pay the difference to the Owner on demand.

#### **§ 12.2.2 After Substantial Completion**

**§ 12.2.2.1** In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the entire Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such nonconforming condition. The Owner shall give such notice promptly after discovery of the condition. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5. Nothing contained in this Section 12.2 is intended to limit or modify any obligations under the law or under the Contract Documents, including any warranty obligations, expressed or implied.

**§ 12.2.2.1.1** If the Contractor fails to perform the corrective Work, then Owner may perform corrective Work, at Contractor's cost. If Owner performs corrective Work, then Owner may, but is not obligated to, also remove nonconforming Work and store the salvageable materials or equipment at Contractor's expense. If the Contractor does not pay all costs incurred by Owner within ten (10) days after written notice, then Owner may, upon ten (10) additional days' written notice, sell the removed materials and equipment in accordance with Owner's policies, and shall account for the proceeds thereof, after deducting costs and damages that should have been borne by the Contractor, including compensation for the Architect's services and expenses made necessary thereby. If such proceeds of sale do not cover costs which the Contractor should have borne, then the Contractor shall pay the difference to the Owner.

**§ 12.2.2.2** The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

**§ 12.2.2.3** The one-year period for correction of Work shall be extended by corrective Work performed by the Contractor pursuant to this Section 12.2, but only as to that corrected Work.

**§ 12.2.3** The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

**§ 12.2.4** The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

**§ 12.2.5** Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

**§ 12.2.6** Contractor shall replace, repair, or restore any parts of the Project or furniture, fixtures, equipment, or other items placed therein (whether by Owner or any other party) that are injured or damaged by any such parts of the Work that do not conform to the requirements of the Contract Documents or by defects in the Work.

**§ 12.2.7** The provisions of this Section 12.2 apply to Work done by Subcontractors and Sub-subcontractors of the Contractor as well as Work done directly by employees of the Contractor. The provisions of this Section 12.2 shall not apply to corrective work attributable solely to the acts or omissions of any Separate Contractor of Owner (unless Contractor is acting in such capacities). The cost to Contractor of performing any of its obligations under this Section 12.2 to the extent not covered by insurance shall be borne by Contractor.

**§ 12.2.8** If, however, Owner and Contractor deem it inexpedient to require the correction of Work damaged or not done in accordance with the Contract Documents, then an equitable deduction from the Contract Sum shall be made by agreement between Contractor and Owner. Until such agreement, Owner may withhold such sums as Owner deems just and reasonable from moneys, if any, due Contractor. The agreement shall not be unreasonably delayed by the Owner and the amount of money withheld shall be based on estimated actual cost of the correction to Owner.

### **§ 12.3 Acceptance of Nonconforming Work**

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not Final Payment has been made.

## **ARTICLE 13 MISCELLANEOUS PROVISIONS**

### **§ 13.1 Governing Law**

The Contract shall be governed by the laws of the State of Texas, and any litigation shall be conducted in state district court. Mandatory and exclusive venue for any disputes shall be in Harris County, or, if no county is specified, then the county in which the Owner's main administrative office is located.

### **§ 13.2 Successors and Assigns**

**§ 13.2.1** The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to the other party hereto and to partners, successors, assigns and legal representatives of such other party in respect to covenants, agreements, and obligations contained in the Contract Documents. Except as expressly provided otherwise in the Contract Documents, neither party to the Contract shall assign the Contract, in whole or in part, without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

**§ 13.2.2** The invalidity of any part or provision of the Contract Documents shall not impair or affect in any manner whatsoever the validity, enforceability or effect of the remainder of the Contract Documents.

### **§ 13.3 Rights and Remedies**

**§ 13.3.1** Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

**§ 13.3.2** No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

### **§ 13.4 Tests and Inspections**

**§ 13.4.1** Tests, inspections, and approvals of portions of the Work shall be made at appropriate times as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities having jurisdiction. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals, which shall be included in the Cost of the Work. Provided, however, per Texas Government Code Chapter 2269, Owner shall bear all costs of inspection services, the testing of construction materials engineering, and the verification testing services necessary for acceptance of the facility by the Owner with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. Where Test and Balance of either air/water or similar, the Contractor shall have their subcontractors perform initial work and assist in this process when requested by the Owner.

**§ 13.4.2** If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of

when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

**§ 13.4.3** If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including, but not limited to, those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

**§ 13.4.4** Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect, with copy to the Owner.

**§ 13.4.5** If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

**§ 13.4.6** Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

### **§ 13.5 Interest**

Undisputed payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate provided by Texas Government Code Section 2251.025. Any such payment shall be deemed overdue on the thirty-first day after Owner received Architect's invoice or Contractor's Certificate for Payment from the Architect, if Owner's Board of Trustees meets more than once per month. Any such payment shall be deemed overdue on the forty-sixth day after Owner receives Architect's invoice or Contractor's Certificate for Payment from the Architect, if Owner's Board of Trustees meets once a month or less frequently. No interest shall be due on sums properly retained by Owner, except as provided by law, or on disputed sums unpaid by Owner.

### **§ 13.6 Equal Opportunity in Employment**

**§ 13.6.1** The Contractor and the Contractor's Subcontractors and Sub-subcontractors shall not discriminate against any employee or applicant for employment in the performance of the Agreement, with respect to hire, tenure, terms, conditions and privileges of employment, or a matter directly or indirectly related to employment, because of race, color, religion, age (except where based on a bona fide occupational qualification), disability, sex except where based on a bona fide occupational qualification), national origin, ancestry, or any other basis protected by law. The Contractor agrees to post in conspicuous places, available to employees and applicants, notices setting forth the Contractor's nondiscrimination policies. Contractor further agrees that every subcontract entered into for the performance of the Agreement will contain a provision requiring non-discrimination in employment herein specified. Breach of this covenant may be regarded as a material breach of the Agreement.

**§ 13.6.2** The Contractor and the Contractor's Subcontractors and Sub-subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, age, disability, sex, national origin, ancestry, or any other basis protected by law.

### **§ 13.7 Records**

**§ 13.7.1** Contractor shall at all times through the date of Final Completion, maintain Job Records, including, but not limited to, invoices, payment records, payroll records, daily reports, diaries, logs, instructions, drawings, receipts, subcontracts, purchase orders, vouchers, memoranda, other financial data and job meeting minutes applicable to the Project, in a manner which maintains the integrity of the documents. Job Records must be retained by Contractor for at least twelve (12) years after the date of Final Completion of the Project. Within ten (10) days of Owner's request, Contractor shall make such Job Records available for inspection, copying and auditing by the Owner, Architect or their respective representatives, at Owner's central office.

**§ 13.7.2** If Contractor is a Construction Manager at Risk, then Contractor shall also maintain, in accordance with the provisions of Section 13.7.1, the following: subcontract files, including proposals of successful and unsuccessful bidders, bid recaps and subcontractor payments; original estimates; estimating work sheets; general ledger entries detailing cash and trade discounts received; insurance rebates and dividends; and any other supporting evidence deemed necessary by the Owner to substantiate charges related to the Contract.

**§ 13.7.3** Contractor shall keep a full and detailed financial accounting system and shall exercise such controls as may be necessary for proper financial management under this Contract; the accounting and control systems shall be satisfactory to the Owner and shall be subject to the provisions of Section 13.7.1.

**§ 13.7.4** Contractor shall keep all Construction Documents related to the Project, subject to the provisions of Section 13.9.1, provided, however, Contractor shall not destroy said documents until Contractor has confirmed with Owner in writing that Owner has obtained a copy of all as-built drawings.

**§ 13.7.5** In the event that an audit by the Owner reveals any errors/overpayments by the Owner, then the Contractor shall refund to the Owner the full amount of such overpayments within thirty (30) days of such audit findings, or the Owner, at its option, reserves the right to deduct such amounts owed to the Owner from any payments due to the Contractor.

### **§ 13.8 Proprietary Interests and Confidential Information**

**§ 13.8.1** Neither Architect nor Contractor shall use the image or likeness of Owner's Project or Owner's official logo or emblem and any other trademark, service mark, or copyrighted or otherwise protected information of Owner, without Owner's prior written consent. Contractor and Architect shall not have any authority to advertise or claim that Owner endorses Architect or Contractor's services, without Owner's prior written consent.

**§ 13.8.2** Neither Architect nor Contractor shall disclose any confidential information which comes into the possession of Architect or Contractor at any time during the Project, including but not limited to, the location and deployment of security devices, security access codes, student likenesses, student record information or employee information.

**§ 13.8.3** The parties acknowledge that, as a public entity in the State of Texas, Owner is subject to, and must comply with, certain open records laws and other disclosure requirements, including, but not limited to, the Texas Public Information Act, Texas Government Code Chapter 552, et seq., subpoenas, and court orders. Nothing in the Contract shall be construed as prohibiting Owner from disclosing any information related to or in connection with the Contract in accordance with such requirements, and Contractor hereby waives any claim against and releases from liability Owner, its trustees, officers, employees, agents, and attorneys with respect to any such disclosure.

**§ 13.9** The Architect may appoint an employee or other person to assist it during the construction. These representatives will be instructed to assist the Contractor in interpreting the Contract Documents; however, such assistance shall not relieve the Contractor from any responsibility as set forth by the Contract Documents. The fact that the Architect's Representative may have allowed Work not in accordance with the Contract Documents shall not prevent the Architect or the Owner from insisting that the faulty Work be corrected to conform with the Contract Documents and the Contractor shall correct same.

**§ 13.10** The Contractor and its employees, agents, consultants, suppliers and subcontractors shall abide by all Owner policies and procedures regarding campus access.

**§ 13.11** Contractor hereby certifies that it is not a company identified on the Texas Comptroller's list of companies known to have contracts with, or provide supplies or services to, a foreign organization designated as a Foreign Terrorist Organization by the U.S. Secretary of State under federal law. Contractor hereby certifies and verifies that neither it, nor any of its affiliates, subsidiaries, or its parent company, if any (the "Contractor Companies"), boycott Israel, and Contractor agrees that it and the Contractor Companies will not boycott Israel during the term of the Contract. For purposes of the Contract, the term "boycott" shall mean and include refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes.

**§ 13.12** In accordance with Texas Government Code § 2269.054, the Contract Documents shall not be construed to deny or diminish the right of any person to work because of the person's membership or other relationship status with respect to any organization.

It is expressly understood that this Contract is not written for the benefit of third parties.

### §13.12 Certificate of Nonsegregated Facility

**§13.12.1** This section is applicable to Contracts and Subcontracts exceeding \$10,000.00 that are not exempt from the provisions of the Equal Opportunity Clause.

**§13.12.2** By the signing of this Contract, the Contractor signifies that it does not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. It certifies further that it will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it will not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The undersigned agrees that a violation of this certification constitutes a breach of this Contract. As used in this certification, the term "segregated facilities" means any waiting rooms, Work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. The Contractor further agrees that (except where it obtained identical certifications from proposed consultants for specific time period) it will obtain identical certifications from proposed Subcontractors prior to the award of a contract exceeding \$10,000.00 that are not exempt from the provisions of the Equal Opportunity Clause; that it will retain such certifications in its files; and that it will forward the following notice to such proposed Subcontractors (except where the proposed Subcontractors have submitted identical certifications for specific time periods): Notice to Prospective Subcontractors of requirement for certification of nonsegregated facilities. A certification of nonsegregated facilities, as required by the May 19, 1967 Order (32 FR 7439, May 19, 1967) on elimination of segregated facilities, by the Secretary of Labor, must be submitted prior to the award of a contract exceeding \$10,000.00 which is not exempt from the provisions of the Equal Opportunity Clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually). The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.11.

**§ 13.13** In accordance with Texas Business & Commerce Code § 116.0001, as soon as practicable after beginning construction of the project, Contractor shall visibly post the following information at the entrance to the construction site: (1) the name and contact information of the Contractor; and (2) a brief description of the project.

## ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

### § 14.1 Termination by the Contractor

**§ 14.1.1** The Contractor may terminate the Contract if the Work is stopped for a period of ninety (90) consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment of undisputed sums due on an approved Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

**§ 14.1.2** The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

**§ 14.1.3** If one of the reasons described in Section 14.1.1 or 14.1.2 exists, then, after the applicable time period, the Contractor may, upon ten (10) business days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed and for proven unrecoverable loss with respect to materials, equipment, tools, and construction equipment and machinery incurred to the date of termination.



**§ 14.1.4** If the Work is stopped for a period of ninety (90) consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters material to the progress of the Work, the Contractor may, upon twenty (20) additional business days' written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

**§ 14.2 Termination by the Owner for Cause**

**§ 14.2.1** The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors, Sub subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors, Sub subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority;
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.
- .5 fails to furnish the Owner, upon request, with assurances satisfactory to the Owner, evidencing the Contractor's ability to complete the Work in compliance with all the requirements of the Contract Documents;
- .6 engages in worker misconduct in violation of Article 3.3.2 or engages in conduct that would constitute a violation of state or federal criminal law, including but not limited to, the laws prohibiting certain gifts to public servants, or engages in conduct that would constitute a violation of the Owner's ethics or conflict of interest policies; or
- .7 fails to proceed continuously and diligently with the construction and completion of the Work, except as permitted under the Contract Documents.

**§ 14.2.2** When any of the reasons described in Section 14.2.1 exist, and subject to any prior rights of the surety, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven (7) days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

**§ 14.2.3** When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished. Any further payment shall be limited to amounts earned to the date of termination.

**§ 14.2.4** If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance of the Contract Sum, the Contractor and/or its Surety shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

**§ 14.2.5** The parties hereby agree that: 1) if an order for relief is entered on behalf of the Contractor, pursuant to Chapter 11 of the U.S. Bankruptcy Code; 2) if any other similar order is entered under any debtor relief laws; 3) if Contractor makes an assignment for the benefit of one or more of its creditors; 4) if a receiver is appointed for the benefit of its creditors; or 5) if a receiver is appointed on account of its insolvency, any such event could impair or frustrate Contractor's performance of the Contract. Accordingly, it is agreed that upon occurrence of any such event, Owner shall be entitled to request of Contractor or its successor in interest adequate assurance of future performance in accordance with the terms and conditions of the Contract Documents. Failure to comply with such request within ten (10) days of delivery of the request shall entitle Owner to terminate the Contract and to the accompanying rights

set forth in Subparagraphs 14.2.1 through 14.2.6. In all events, pending receipt of adequate assurance of performance and actual performance in accordance with the Contract Documents, Owner shall be entitled to proceed with the Work with Owner's own forces or with other Contractors on a time and material or other appropriate basis, the cost of which will be charged against the Contract Sum.

**§ 14.2.6** As required by Texas Government Code Chapter 2253, if a Performance Bond has been furnished and the Contractor is declared by the Owner to be in default under the Contract, then the Surety shall promptly perform the Work, in full accordance with the plans, specifications and Contract Documents. Unless otherwise agreed in writing between the Surety and the Owner, the Surety shall complete the Work by the Surety entering into a Contract acceptable to Owner, with a contractor acceptable to Owner, and shall obtain new Payment and Performance Bonds as required by law.

**§ 14.3 Suspension by the Owner for Convenience**

**§ 14.3.1** The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

**§ 14.3.2** The Contract Sum and Contract Time may, by mutual written agreement, be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum may include profit, upon written agreement of the parties. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

**§ 14.4 Termination by the Owner for Convenience**

**§ 14.4.1** The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

**§ 14.4.2** Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

**§ 14.4.3** In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed and for proven unrecoverable loss with respect to materials, equipment, tools, and construction equipment and machinery incurred to the date of termination. Such payment shall not cause the Contract Sum to be exceeded. Such payment shall not include overhead and profit for Work not executed.

**§ 14.4.4** Upon determination by a Court of competent jurisdiction that termination of the Contractor pursuant to Section 14.2 was wrongful, such termination will be deemed converted to a termination for convenience pursuant to Section 14.4, and Contractor's remedy for wrongful termination shall be limited to the recovery of the payments permitted for termination for convenience as set forth in Section 14.4.

**§ 14.5 Termination by the Owner for Non-Appropriation**

**§ 14.5.1** If the Contract is a multi-year contract funded through Owner's current general funds that are not bond funds, the parties agree that the Contract is a commitment of Owner's current revenue only. As such, notwithstanding any contrary provision of the Contract, any payment obligation(s) of Owner created by the Contract shall be conditioned upon the availability of funds that are duly appropriated and allocated for such purpose. If such funds are not available, as determined by Owner in its sole discretion, Owner shall have the right to terminate the Contract, without default, penalty, or further obligation or liability to Contractor, effective at the end of the period for which such funds are available. In the event this provision is exercised, Owner shall provide written notice of non-appropriation, specifying the effective date of termination, to Contractor as soon as is reasonably practicable.

**§ 14.5.2** Upon receipt of notice from the Owner of such termination for non-appropriation, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;

- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

**§ 14.5.3** In case of such termination for non-appropriation, to the extent that funds have been duly appropriated and allocated for such purpose and are available, the Owner shall pay the Contractor for Work properly executed and for proven unrecoverable loss with respect to materials, equipment, tools, and construction equipment and machinery incurred to the date of termination. Such payment shall not cause the Contract Sum to be exceeded. Such payment shall not include overhead and profit for Work not executed.

## **ARTICLE 15 CLAIMS AND DISPUTES OF CONTRACTOR**

### **§ 15.1 Claims**

#### **§ 15.1.1 Definition**

A Claim is a demand or assertion by the Contractor seeking, as a matter of right, payment of money, interpretation of the Contract terms, a change in the Contract Time, or other relief with respect to the terms of the Contract, the Work, or the Project. The responsibility to substantiate Claims shall rest with the Contractor. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

#### **§ 15.1.2 Time Limits on Litigation**

The Contractor shall commence all litigation against the Owner and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement, if any, and within the period specified by applicable law, but in any case not more than 8 years after the date of Substantial Completion of the Work, unless extended in accordance with Texas Civil Practice & Remedies Code Section 16.009. The Contractor waives all claims not commenced in accordance with this Section 15.1.2.

#### **§ 15.1.3 Notice of Claims**

**§ 15.1.3.1** Claims by the Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by written notice to the Owner and to the Architect. Claims by the Contractor under this Section 15.1.3.1 shall be initiated within twenty-one (21) calendar days after occurrence of the event giving rise to such Claim or within twenty-one (21) calendar days after the Contractor first knew or should have known of the condition giving rise to the Claim, whichever is earlier. Claims must be initiated by written notice titled "Notice of Claim" ("Notice") and sent to the Architect and Owner's designated representative. The Notice shall clearly set out the specific matter of complaint, and the impact or damages which may occur or have occurred as a result thereof, to the extent that the impact or damages can be assessed at the time of the Notice. If the impact or damages cannot be assessed as of the date of the Notice then the Notice shall be amended at the earliest date that is reasonably possible. It is imperative that Owner receive timely specific Notice of any potential problem identified by Contractor in order that the problem can be mitigated or resolved promptly. Any claim or portion of a claim by Contractor that has not been made the specific subject of a Notice within ninety-one (91) days after the occurrence of the event giving rise to such claim or within ninety-one (91) days after the Contractor first knew or should have known of the condition giving rise to the Claim, whichever is earlier, shall be waived. Pursuant to Texas Civil Practices and Remedies Code Section 16.071, Contractor agrees that this is a reasonable notice requirement.

**§ 15.1.3.2** Claims by Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the Owner. In such event, no decision by the Initial Decision Maker is required.

#### **§ 15.1.4 Continuing Contract Performance**

**§ 15.1.4.1** Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make undisputed payments for Work performed in accordance with the Contract Documents.



§ 15.1.4.2 The Contract Sum and Contract Time may be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

**§ 15.1.5 Claims for Additional Cost Or an Increase in the Contract Sum**

If the Contractor wishes to make a Claim for additional cost or for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given to Owner and Architect. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4. The Architect will promptly investigate such Claim and report findings and a recommended resolution in writing to the Owner and Contractor. If the Claim is approved by Owner's Board of Trustees, or Owner's representative if otherwise delegated and provided for herein, then Contractor shall proceed with the execution of the Work that is the subject matter of the Claim. If the Claim is rejected by the Owner, then Contractor may pursue alternative dispute resolution or other legal remedies as provided for in the Contract Documents. Under no circumstances shall a claim for additional cost or for an increase in the Contract Sum resulting from supply chain issues or market escalation be approved by Owner.

**§ 15.1.6 Claims for Additional Time**

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, such a Claim shall be documented in accordance with Article 8 and notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of the probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 Claims for increase in the contract time shall set forth in detail the circumstances that form the basis for the Claim, the date upon which each cause of delay began to affect the progress of the Work, the date upon which each cause of delay ceased to affect the progress of the Work and the number of days increase in the Contract Time claimed as a consequence of each such cause of delay. Additionally, any Claim for additional time based on adverse weather conditions shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

1. Weather data in the table below shall form the baseline for establishing Anticipated Adverse Weather Days per month associated with the Project schedule duration.

Anticipated Adverse Weather Days	
Month	Total of Weather Days Allowed
January	6
February	6
March	5
April	4
May	6
June	7
July	6
August	6
September	6
October	6
November	6
December	6

a. The Anticipated Adverse Weather Days shall be submitted with the Contractor's Construction Schedule for documenting future weather events and is considered to be part of the Project duration forming the Contract Time.

2. When the Project requires work in an occupied building, Instruction Days in the table below shall form

the baseline for establishing Instruction Days per month associated with the Project schedule duration.

Anticipated Instruction Days	
Month	Total of Instruction Days Allowed
January	0
February	0
March	0
April	4
May	4
June	0
July	0
August	0
September	0
October	0
November	0
December	0

a. The Anticipated Instruction Days shall be submitted with the Contractor's Construction Schedule for documenting future Instruction Days and is considered to be part of the Project duration forming the Contract Time.

### 3. Submission for Time Extension

- a. Although the Contractor is required to document the occurrence and effect of Adverse Weather or Instruction Days on the Work, it does not relieve the Contractor/Architect of its responsibility to investigate and determine if an excusable delay has occurred.
- b. The schedule of Anticipated Adverse Weather Days and Instruction Days included in the Contract is established in Work Days. Similarly, actual weather data should be collected and recorded on a Work Day basis. Monthly summaries should be maintained indicating actual Adverse Weather conditions or Instruction Days and the impact on Work activities.
- c. To determine if a given month experienced Adverse Weather Days or Instruction Days, the number of actual Adverse Weather Days or Instruction Days is subtracted from the Anticipated Adverse Weather Days or Anticipated Instruction Days. If the number of Adverse Weather Days or Instruction Days is greater than the Anticipated Adverse Weather Days or Anticipated Instruction Days for a given month, then the Contractor has experienced unusually severe weather or Work disruption for the given month. If the number of Adverse Weather Days or Instruction Days is less than the Anticipated Adverse Weather Days or Anticipated Instruction Days for a given month, then the Net Days shall accumulate to the remaining months and shall be treated as float to the Project. Float time contained in the Contractor's Construction Schedule is not for the exclusive benefit of the Contractor or the Owner, but belongs to the Project and may be consumed by either party as needed on a first-used basis.
- d. THE DETERMINATION THAT UNUSUALLY SEVERE WEATHER OR INSTRUCTION DAYS OCCURRED DOES NOT AUTOMATICALLY MEAN THAT THE CONTRACTOR RECEIVES A TIME EXTENSION FOR THE DIFFERENCE OF DAYS BETWEEN THE ANTICIPATED AND ACTUAL ADVERSE WEATHER DELAY OR INSTRUCTION DAYS. Further analysis is necessary to determine if the unusually severe weather or Instructional Days delayed Work activities critical to Contract completion. The Contractor's progress schedule must be evaluated to make this determination. If it is found that unusually severe weather or Instructional Days delayed the Contract, a Contract Modification shall be issued.
- e. Claims for increase in the Contract Time shall set forth in writing the detail noting the circumstances that form the basis for the claim, the date upon which each cause of delay began to

affect the progress of the Work, the date upon which each cause of delay ceased to affect the progress of the Work and the number of days increase in the Contract Time claimed as a consequence of each such cause of delay. The Contractor shall bear the entire economic risk of all weather delays and Instruction Days disruptions and shall not be entitled to any increase in the Contract Price by reason of such delays or disruptions. Requests for an extension of time pursuant to this Subparagraph shall be submitted to the Architect in writing not later than with each Application for Payment and shall include documentation demonstrating the nature and duration of the delays or disruptions. Where appropriate, a revised construction schedule indicating all the activities affected by the circumstances shall be included with the documentation.

f. The parties agree that the reconciliation of the change attributable to Adverse Weather or Instruction Days will occur at the time of Project Final Completion but the Contractor shall provide weekly reporting on weather delays, noting what happened, how they were affected. A claim for rain shall not be made unless total rainfall from 12:01 am to 12:00 pm exceeds 0.25".

**§ 15.1.6.3** No extension of time shall be made to the Contractor because of hindrances or delays from any cause which is the fault of Contractor or Contractor's Subcontractors, Sub-subcontractors, or suppliers or otherwise under Contractor's control. Claims for extension of time may only be considered because of Adverse Weather Days, or hindrances or delays which are the fault of Owner and/or under Owner's control, but only to the extent that Substantial Completion of the Project is adjusted beyond the original Substantial Completion date. Claims for extension of time because of hindrances or delays not the fault of either Contractor or Owner shall be considered, but only to the extent that Substantial Completion of the Project exceeds the Substantial Completion date established for the Work. Unless otherwise delegated, Board approval shall be required for any extension of time. Contractor shall only be entitled to time extensions per the terms of the Contract Documents.

**§ 15.1.6.4** Notwithstanding any provision herein to the contrary, if the Contractor desires to make a one-time Claim for costs directly resulting from permit delays, this Section 15.1.6.4 shall apply. Any Claim for costs directly resulting from permit delays may only begin accruing following the expiration of the anticipated permit release duration stated in the procurement solicitation, and regardless of the duration stated in the procurement solicitation, only if the duration from Notice to Proceed to release of permit exceeds 90 Calendar Days. A Claim under this Section 15.1.6.4 shall be made no later than twenty-one (21) calendar days after the permit has been released. In making such a one-time Claim for costs directly resulting from permit delays, the Contractor shall be limited to a percentage change rate per day for any claimed actual additional costs, regardless of actual cost to the Contractor or any subcontractor. Claims for Contractor's general conditions will not be allowed. If the Claim is approved, the percentage change rate per day shall be determined as follows: Reference source is the Building Cost Index (BCI) change as reported by Engineering News Record (ENR) at the following link ([https://www.enr.com/economics/historical\\_indices/Dallas](https://www.enr.com/economics/historical_indices/Dallas)). Using the BCI published in the month preceding the due date of the proposals as the baseline value, average the next three (3) months of subsequently reported data; divide the three (3) month average by the benchmark value, subtract one, and convert to percentage; divide the result by ninety (90) days to determine the daily change limit of any actual costs. Additionally, in making a Claim for additional actual costs under this section, the Contractor agrees that the Owner, Architect, or their respective agents is thereby entitled to review all (related or unrelated to the Claim) bids, proposals, quotes, quantity take-offs, and executed subcontractor agreements for the Project and to contact subcontractors to verify facts pertaining to same. Owner shall be entitled to a credit if the Owner, Architect, or their respective agents' inspection of all bids, proposals, quotes, quantity take-offs, and subcontractor agreements indicate a variance in favor of the Owner. The completion of the Owner's inspection and issuing of a report of the determination of finding relating to a Claim under this section is a precondition to the commencement of time limits for Claims stated in § 15.2. Any Claim under this section 15.1.6.4 shall be subject to the review and approval/rejection procedures outlined in Article 8 and 15.

#### **§ 15.1.7 Waiver of Claims for Consequential Damages**

The Contractor waives all Claims against Owner for consequential damages arising out of or relating to this Contract, including, but not limited to, any amount owed as compensation for the increased cost to perform the Work as a direct result of Owner-caused delays or acceleration.

## **§ 15.2 Resolution of Claims and Disputes**

**§ 15.2.1** Claims by the Contractor against the Owner, including those alleging an error or omission by the Architect, shall be referred initially to the Architect for written recommendation. An initial recommendation by the Architect shall be required as a condition precedent to mediation or litigation of all Claims by the Contractor arising prior to the date Final Payment is due, unless thirty (30) days have passed after the Claim has been referred to the Architect with no recommendation having been rendered by the Architect.

**§ 15.2.2** The Architect will review Claims and within ten (10) days of the receipt of a Claim take one of the following actions: (1) request additional supporting data from the Contractor, or (2) make a written recommendation to the Owner, with a copy to the Contractor.

**§ 15.2.3** In evaluating Claims, the Architect may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Architect in making a written recommendation.

**§ 15.2.4** If the Architect requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten (10) days (or in the case of Owner, ten (10) business days) after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Architect when the response or supporting data will be furnished, or (3) advise the Architect that no supporting data will be furnished.

**§ 15.2.5** Following receipt of the Architect's written recommendation regarding a Claim, the Owner and Contractor shall attempt to reach agreement as to any adjustment to the Contract Sum and/or Contract Time. If no agreement can be reached, then either party may request mediation of the dispute pursuant to Section 15.3.

**§ 15.2.6** Upon receipt of a Claim against the Contractor or at any time thereafter, the Architect or the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Architect or the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

## **§ 15.3 Alternative Dispute Resolution**

**§ 15.3.1** Any Claim arising out of or related to the Contract, except Claims relating to aesthetic effect and except those waived under the terms of the Contract Documents, may upon mutual written agreement, after written recommendation by the Architect or thirty (30) days after submission of the Claim to the Architect, be subject to mediation at the request of either party. Owner and Contractor expressly agree that mediation shall not be a condition precedent to the initiation of any litigation arising out of such Claim. Claims for injunctive relief shall not be subject to this Section.

**§ 15.3.2** The parties may endeavor to resolve their Claims by mediation. A request for mediation shall be made in writing to the other party to the Contract. Mediation shall be subject to and in accordance with Chapter 154 of the Texas Civil Practice & Remedies Code. Mediation shall be conducted by a mutually-agreed-upon mediator. In the event that the parties are unable to agree on a mediator, then the mediation shall be conducted by the Center for Public Policy Dispute Resolution at the University of Texas School of Law.

**§ 15.3.3** The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the county where the Owner's main administrative office is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be reduced to writing, considered for approval by the Owner's Board of Trustees, signed by the parties if approved by the Board of Trustees, and, if signed, shall thereafter be enforceable as provided by the laws of the State of Texas.

**§ 15.3.4** Any claim not resolved in mediation shall be subject to litigation pursuant to Section 13.1.

## **§ 15.4 No Arbitration**

Notwithstanding anything to the contrary in the Contract Documents or in any document forming a part hereof, there shall be no mandatory arbitration for any dispute arising hereunder.

§ 15.5 Contractor stipulates that Owner is a political subdivision of the State of Texas, and, as such, enjoys immunities from suit and liability provided by the Constitution and laws of the State of Texas. Nothing in the Contract shall be construed as a waiver or relinquishment of any governmental immunities or defenses on behalf of Owner, its trustees, officers, employees, or agents as a result of the execution of the Contract or performance of the functions or obligations described therein.

§ 15.6 In any adjudication under this Agreement, attorneys' fees may be awarded as provided by law.

## ARTICLE 16 ADDITIONAL PROVISIONS

§ 16.1 These general conditions incorporate by reference the following documents:

**Exhibit A:** Wage Rate Determination

\_\_\_\_\_  
**OWNER** *(Signature)*

« »« »

\_\_\_\_\_  
*(Printed name and title)*

\_\_\_\_\_  
*(Date)*

\_\_\_\_\_  
**CONTRACTOR** *(Signature)*

« »« »

\_\_\_\_\_  
*(Printed name and title)*

\_\_\_\_\_  
*(Date)*



**SECTION 01 1100  
SUMMARY OF WORK**

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

- A. Work Included:
1. The "Project" of which the "Work" of this Contract is a part, is titled Tomball High School #3 for Tomball, ISD and is composed of a new high school facility, associated ancillary buildings, sports facilities and related site work located in Tomball, Texas.
  2. The "Work" of this Contract is titled Tomball High School #3 and is defined in the Contract Documents to include, but not necessarily to be limited to:
    - a. A new high school facility, associated ancillary buildings and sports facilities, including all mechanical, electrical, plumbing, and general construction work.
  3. Related Work:
    - a. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 01 of these Specifications.
    - b. The work of other contracts is described in various contract documents prepared therefore, some of which are in the possession of the Owner and are available for inspection by interested parties.
- B. Other Work:
1. Owner (if required by Municipality, State or Federal requirements) shall provide evidence to the municipality permitting the project that an asbestos survey has been completed by a person licensed under the Texas Asbestos Health Protection Act to perform such a survey.
  2. The architect has no responsibility for the discovery, presence, handling, removal or disposal of or exposure of persons to hazardous materials or toxic substances in any form at the project site.
  3. The architect is not required to execute certifications that would require knowledge, services or responsibilities beyond the scope of the architectural service agreement.
  4. The architect assists the owner in the owner's responsibility to obtain applicable permits for demolition and construction.
  5. Contractor to review and familiarize themselves with owner's Asbestos survey and plan and shall inform every worker that they use on this project as to the availability of these surveys and plans prior to starting any work.

**END OF SECTION**





**SECTION 01 1400  
WORK RESTRICTIONS**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Work Included:
  - 1. Contractor shall comply with the following requirements concerning scope and work restrictions.
  - 2. If the Contractor believes that meeting the restrictions in this section would cause a delay to the intended schedule, they shall issue an RFI requesting specific modifications to that specific Work Restriction that would permit construction to continue without delay and indicating the reasons for the request. If construction proceeds without meeting any of the restriction requirements or obtaining approval for a modification of these requirements, the Contractor shall be responsible for all costs associated with removing and replacing all construction that occurred in violation of the Work Restrictions, if directed to by the Architect, without any increase in approved construction costs or schedule for the project.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 01 of these Specifications.
  - 2. The work of other contracts is described in various contract documents prepared therefore, some of which are in the possession of the Owner and are available for inspection by interested parties.
- C. Specific Project Restrictions:
  - 1. Contractor shall schedule project to allow for a full season of grow-in on the athletic fields.
  - 2. All fire access roads, on and offsite, shall be complete prior to constructing vertical elements of the building.
  - 3. Before project completion and a certificate of occupancy is issued, Contractor shall provide fully established grass at locations including but not limited to all disturbed areas, under items that have been stored on site, construction trailers and storage units.
- D. Project restrictions related to Quality Control
  - 1. The Contractor shall not be permitted to begin work on-site (other than job trailer installation and/or removal of on-site vegetation) until the Contractor has scheduled and hosted a "Foundation Pre-Construction" meeting (in person or on a conference call) with the Architect's Construction Observer, a representative of the Special Inspection and Testing Agency (SITA), a representative of the Structural Engineer, the Superintendent of Construction, Contractor's Project Manager, and all foremen for subcontractors with work related to the foundation.
  - 2. The Contractor shall not be permitted to continue work on-site (other than job trailer installation and/or removal of on-site vegetation) more than one week after the Foundation Pre-Construction meeting (or an alternative deadline if requested by the Contractor and approved by the Architect) unless:
    - a. The Contractor has obtained correspondence from the Geotechnical Engineer indicating that the Geotechnical Engineering firm has reviewed all relevant Construction Documents for conformance with their recommendations and indicated any portions of these documents which, in their opinion, do not conform with their recommendations. The term "relevant Construction Documents" shall include this Project Manual, all construction drawing sheets, any addenda issued before proposals are received, any addenda issued after proposals are received but before an Owner/Contractor Agreement is fully executed, and any changes in scope associated with a Request For Proposal (RFP) that is approved before construction begins.

- b. The Contractor has obtained verification in writing from the Architect that the SITA has issued one or more acceptable statements indicating the SITA will be performing the scope of work for the SITA specified in Section 01 4533 and that the SITA as well as all SITA Staff that will be performing work on this project will meet the qualifications specified in Section 01 4533.
  - c. The Contractor has obtained verification in writing from the Mechanical and Electrical Engineers that the CxA has issued one or more acceptable statements indicating the CxA will be performing the scope of work for the CxA specified in Section 01 4533 and that the CxA as well as all CxA Staff that will be performing work on this project will meet the qualifications specified in Section 01 4533. This verification shall also confirm that the specified commissioning services on this project comply with the applicable version of the International Energy Conservation Code (IECC).
  - d. The Contractor has submitted to Tomball, ISD, the Building Official, and the Architect a written "Acknowledgement of Contractor's Responsibilities Related to Code-Required Quality Control". (Refer to Section 01 4533 for suggested language.)
  - e. The Contractor has confirmed in writing to the Architect that the Contractor has scheduled and hosted a "Quality Control Pre-Construction Meeting", following the agenda in Section 01 4533, listing the names and project roles of all attendees.
- 3. The Contractor shall not be permitted to drill any holes for actual piers until verifying in writing that the Structural Engineer has either determined that the conditions encountered in the Test Pier Hole report are generally consistent with those required for proposal purposes, or issued modifications to the pier design. Proposers shall assume for proposal purposes that they shall not be permitted to drill holes for actual piers until one (1) calendar week after the Test Pier Holes are drilled. It is hoped that this will take less time. This paragraph shall not apply to light pole bases.
  - 4. The Contractor shall not be permitted to apply for a Certificate of Occupancy until the Contractor has obtained a copy of each Final Report of Quality Control from every firm providing quality control services where required by the Final Report provisions of Section 01 4533 and, in addition, the Contractor has submitted to the AHJ the Final Report of Quality Control from the SITA, the Final Report of Quality Control from the CxA and the Final Report of Quality Control from the Code-Required Structural Observer. (The Contractor shall submit reports from the other quality control personnel if requested by the AHJ.)
- E. Project Restrictions related to the General Framing Preconstruction Meeting
    - 1. The Contractor shall not be permitted to install any portion of the superstructure until the Contractor has scheduled and hosts a "General Framing Preconstruction Meeting" in which the following people attend: A representative of the Architect, a representative of the Structural Engineer, the SITA, the Superintendent of construction, the Contractor's Project Manager, and all foremen for subcontractors with work related to the framing.

**END OF SECTION**

**SECTION 01 2100  
ALLOWANCES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Contingency allowance.
- B. Payment and modification procedures relating to allowances.

**1.02 CONTINGENCY ALLOWANCE**

- A. Contingency Allowance shall be included in the contract sum.
- B. Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit will not be included in Change Orders authorizing expenditure of funds from this Contingency Allowance.
- C. At closeout of Contract, funds remaining in Contingency Allowance will be credited to Owner by Change Order.

**1.03 ALLOWANCES SCHEDULE**

- A. Contingency Allowance: Include the stipulated sum/price of \$7,000,000 for use upon Architect's and Owner's instructions.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**



**SECTION 01 2200  
UNIT PRICES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Measurement and payment criteria applicable to Work performed under a unit price payment method.

**1.02 RELATED REQUIREMENTS**

- A. Document 00 1119-Request for Competitive Sealed Proposals.

**1.03 COSTS INCLUDED**

- A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

**1.04 MEASUREMENT OF QUANTITIES**

- A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.
- B. Take all measurements and compute quantities. Measurements and quantities will be verified by Architect.
- C. Assist by providing necessary equipment, workers, and survey personnel as required.
- D. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.
- E. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.
- F. Measurement by Area: Measured by square dimension using mean length and width or radius.
- G. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord.

**1.05 PAYMENT**

- A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit price.
- B. The following unit prices may apply on any additions to, or deductions from the work, which prices shall include overhead, profit, taxes, and all other related costs. The unit prices shall be installed, in-place prices for materials/systems as specified. The quoted unit prices will be valid, and the quoted unit prices will be in force on any work. A singular cost shall be provided below to be used for both additions and deductions. If different prices are provided for additions and deductions the average of the absolute values will be used. The materials and work shall be in compliance with the specifications. The Contractor shall not be compensated for work that is not authorized by the Architect or Owners Laboratory (e.g. over drilling of piers and additional concrete and reinforcement for over drilled piers)

**1.06 SCHEDULE OF UNIT PRICES**

- A. See Document 00 1119-Request for Competitive Sealed Proposals, Exhibit R - Bid Alternates and Unit Price Form.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

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**SECTION 01 2300  
ALTERNATES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Description of Alternates.
- B. Procedures for pricing Alternates.

**1.02 PROCEDURES**

- A. Proposers are required to submit alternate proposals to add work or to deduct work from the base proposal as described below. Failure to submit alternate amounts in spaces provided on proposal form is basis for disqualification of proposal.
- B. The successful proposer shall not modify, withdraw or cancel any of the alternate proposals or any part thereof for 45 days after date of receipt of proposals, unless specifically noted otherwise.
- C. Contractor shall be responsible for any changes in the work affected by acceptance of these alternates. Include within the alternative proposal prices all costs, including materials, installations, and fees.
- D. Claims for additional dollars resulting from changes caused by the alternates will not be allowed.
- E. Refer to the drawings and project manual for items of work affected by alternates.
- F. Alternates will be exercised at the option of the Owner.
- G. Coordinate related work and modify surrounding work as required to complete the Work, including changes under each alternate, when acceptance is designated in the Owner - Contractor Agreement.

**1.03 ACCEPTANCE OF ALTERNATES**

- A. Indicate variation of proposal price for alternates described below and list on the proposal form or any supplement to it, which requests a 'difference' in proposal price by adding to or deducting from the base proposal price or by indicating "No Charge".
- B. Indicating "No Bid" as an alternate is unacceptable and is reason for rejection of the proposal.
- C. Alternates quoted on Bid / Proposal Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.
- D. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

**1.04 SCHEDULE OF ALTERNATES**

- A. Alternate Number 1:
  - 1. Omit Practice Gym (RM 900) and associated exterior walls, flooring, roofing, structural elements, and utilities as specified and as shown on the drawings.
- B. Alternate Number 2:
  - 1. Base Bid Adjustment: This alternate shall establish the adjustments to the General Contractor's Base Proposal submitted, if necessary. This alternate shall be accepted whether it is an add or deduct and will be used as part of the evaluation process to determine the best value for the District.
- C. Alternate Number 3a:
  - 1. Provide Chiller Units by Carrier as specified and as shown on the drawings in lieu of the specified Base Bid manufacturer.
- D. Alternate Number 3b:
  - 1. Provide Chiller Units by Trane as specified and as shown on the drawings in lieu of the specified Base Bid manufacturer.

- E. Alternate Number 4a:
  - 1. Provide Air Handling Units by Carrier as specified and as shown on the drawings in lieu of the specified Base Bid manufacturer.
- F. Alternate Number 4b:
  - 1. Provide Air Handling Units by Trane as specified and as shown on the drawings in lieu of the specified Base Bid manufacturer.
- G. Alternate Number 5:
  - 1. Cost to provide Refrigerant Recovery/Storage System and Tube Bundle Brushing Machine per specification section 23 6416 Centrifugal Water Chillers Article 2.04 and 2.05.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**



**SECTION 01 3000  
ADMINISTRATIVE REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. General administrative requirements.
- B. Electronic document submittal service.
- C. Preconstruction meeting.
- D. Schedule of Values.
- E. Progress meetings.
- F. Submittal Schedule.
- G. Submittals for review and project closeout.
- H. Number of copies of submittals.
- I. Submittal procedures.
- J. Progress Payments.
- K. Contractor's Daily Field Report.
- L. Request For Information.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 1100 - Summary of Work
- B. Section 01 3216 - Construction Progress Schedule: Form, content, and administration of schedules.
- C. Section 01 6000 - Product Requirements: General product requirements.
- D. Section 01 7000 - Execution and Closeout Requirements: Additional coordination requirements.
- E. Section 01 7800 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

**1.03 GENERAL ADMINISTRATIVE REQUIREMENTS**

- A. The Notice to Proceed shall not be issued by the Architect until the Agreement (or Amendment, if Contractor is a Construction Manager at Risk) including final GMP and all exclusions or other post Proposal agreements, have been signed and approved as well as all required payment and performance bonds and insurance, and furnished to the Architect.
- B. Comply with requirements of Section 01 7000 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.
- C. Make the following types of submittals to Architect:
  - 1. Requests for Information (RFI).
  - 2. Requests for substitution.
  - 3. Shop drawings, product data, and samples.
  - 4. Test and inspection reports.
  - 5. Design data.
  - 6. Manufacturer's instructions and field reports.
  - 7. Applications for payment and change order requests.
  - 8. Progress schedules.
  - 9. Coordination drawings.
  - 10. Correction Punch List and Final Correction Punch List for Substantial Completion.
  - 11. Closeout submittals.
  - 12. Warranty request and corrective action descriptions.

## **PART 2 PRODUCTS - NOT USED**

## **PART 3 EXECUTION**

### **3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE**

- A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF) format, as appropriate to the document, and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
  - 1. This includes submittals for review, information, requests for information (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), field reports and meeting minutes, preliminary closeout for review, final project record documents closeout submittal and any other document any participant wishes to make part of the project record.
  - 2. Contractor and Architect are required to use this service at no cost to the Contractor.
  - 3. It is Contractor's responsibility to submit documents in allowable format.
  - 4. Subcontractors, suppliers, and Architect's consultants will be permitted to use the service at no charge.
  - 5. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, [www.adobe.com](http://www.adobe.com), or Bluebeam PDF Revu, [www.bluebeam.com](http://www.bluebeam.com)), unless such software capability is provided by the service provider.
  - 6. Paper document transmittals will not be reviewed.
  - 7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.
- B. Submittal Service: The selected service is:
  - 1. Newforma Info Exchange: <https://newforma.huckabee-inc.com/UserWeb>
    - a. Contractor will receive a username and password upon award of the project.
- C. Training: External user tutorials are available at [www.newforma.com/external-users-tutorials](http://www.newforma.com/external-users-tutorials). The awarded General Contractor will be required to become familiar with the program prior to Notice to Proceed being issued.
- D. Project Closeout: Architect will determine when to terminate the service for the project. Contractor is responsible for providing digital and hard copies of the final project record documents closeout submittal to the Owner. Should Owner forgo hard copies, Contractor shall submit a credit to the Owner.

### **3.02 PRECONSTRUCTION MEETINGS**

- A. A Kick-Off Pre-Construction meeting will be scheduled to be held upon notification by the Architect.
  - 1. Provide attendance by authorized representatives of the Contractor and major subcontractors.
  - 2. The Architect will advise other parties, including the Owner, and request their attendance.
  - 3. The Architect shall arrange, preside, and record the minutes of the pre-construction meeting.
  - 4. A pre-construction meeting agenda will be issued by the Architect at the meeting.
  - 5. Agenda items to be discussed include:
    - a. Self introductions
    - b. Design concept, scope, and objectives
    - c. Communications
    - d. Contractor's responsibilities
    - e. Documentation and notification
    - f. Progress Meetings
    - g. Submittals/Substitutions
    - h. Project Administration

- i. Project Closeout
  - j. Warranty Phase
- B. Foundation Pre-Construction Meeting
  1. Before beginning any work on-site (other than job trailer installation and/or removal of on-site vegetation) the Contractor shall schedule and host a "Foundation Pre-Construction" meeting (in person or on a conference call) with the Architect's Construction Observer, a representative of the Special Inspection and Testing Agency (SITA), the Code-Required Structural Observer, a representative of the Structural Engineer, the Superintendent of Construction, Contractor's Project Manager, and all foremen for subcontractors with work related to the foundation.
- C. Quality Control Pre-Construction Meeting
  1. Within one week after the "Foundation Pre-Construction Meeting", the Contractor shall schedule and host a "Quality Control Pre-Construction Meeting" following the Agenda in Section 01 4533.
- D. Framing Pre-Construction Meeting: The Contractor shall not be permitted to install any portion of the superstructure above the foundation until the Contractor has scheduled and held a "General Framing Preconstruction Meeting" in which the following people attend: A representative of the Architect, a representative of the Structural Engineer, the Special Inspection and Testing Agency (SITA), the Superintendent of construction, the Contractor's Project Manager, and all foremen for subcontractors with work related to the framing.

### **3.03 SCHEDULE OF VALUES AND DRAWDOWN SCHEDULE**

- A. Within twenty-one (21) calendar days following Notice to Proceed, the Contractor shall submit a Schedule of Values (using the breakdown of the Construction Schedule activities) for review by the Owner's Representatives. The Schedule of Values will allocate a dollar value (cost) for each activity of the Construction Schedule. Each activity cost allocation shall include a labor, equipment and material cost and a pro rata contribution to overhead and profit. The sum of all activity costs shall be equal to the total Contract Sum. Each activity cost shall be coded with a cost code corresponding to the subcontractor responsible for the Work so that subtotals for each division of the Work can be prepared.
- B. Within twenty-one (21) calendar days following Notice to Proceed, the Contractor shall submit a Drawdown Schedule showing anticipated monthly payments from the Owner for coordination of allocated funds for the Project.
- C. Within thirty (30) calendar days following Notice to Proceed, the Contractor shall participate in a conference with the Owner's Representatives to review, evaluate and approve the Schedule of Values and Drawdown Schedule. The approved Schedule of Values and Drawdown Schedule shall, in the best judgment of the Contractor, the Project Manager, and the Architect represent a fair, reasonable, and equitable dollar (cost) allocation for each activity on the Construction Schedule.

### **3.04 PROGRESS MEETINGS**

- A. Schedule and administer jobsite meetings throughout progress of the Work in intervals agreed to at the Preconstruction Meeting.
- B. Contractor will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings. Agendas and prior meeting minutes shall be distributed 24 hours prior to meeting.
- C. Attendance Required: Job superintendent, major Subcontractors and suppliers (as invited), Owner, Architect, as appropriate to agenda topics for each meeting. Representation should be consistent throughout project.
- D. Agenda:
  1. Review minutes of previous meetings.
  2. Review of work progress.
  3. Field observations, problems, and decisions.

4. Identification of problems that impede, or will impede, planned progress.
  5. Review of submittals schedule and status of submittals.
  6. Review of off-site fabrication and delivery schedules.
  7. Maintenance of progress schedule.
  8. Corrective measures to regain projected schedules.
  9. Planned progress during succeeding work period.
  10. Coordination of projected progress.
  11. Maintenance of quality and work standards.
  12. Effect of proposed changes on progress schedule and coordination.
  13. Status of Request for Information (RFI).
  14. Status of Request for Change Proposal (RFP).
  15. Other business relating to work.
  16. Construction forecast for 3 weeks.
  17. Weather Delay Requests.
  18. Quality Control.
- E. Record minutes and distribute typewritten copies within two days after meeting to participants, with one copy to Architect, Owner, participants, and those affected by decisions made.
1. Unless published minutes are challenged in writing prior to the next regularly scheduled progress meeting, they will be accepted as properly stating the activities and decisions of the meeting.
  2. Persons challenging published minutes shall reproduce and distribute copies of the challenge to all indicated recipients of the particular set of minutes.
  3. Challenge to minutes shall be settled as priority portion of "old business" at the next regularly scheduled meeting.

### **3.05 SUBMITTAL SCHEDULE**

- A. Within twenty-one (21) business days following the Notice to Proceed, the Contractor shall submit a Submittal Schedule for review by the Architect and Owner. This schedule shall coincide with the approved Construction Schedule accommodating the submittal review and material selection times as required by Architect, Owner or Owner's Representatives. In the event a submittal schedule is not provided and approved by the Architect, Owner, or the Owner's Representative at the submission of the 2nd pay application, the 2nd pay application will be held until the submittal schedule is complete as noted above.
- B. This schedule shall list all required submittals, product data, and samples for the project. Each item to be submitted shall include the date to be submitted, review time and the scheduled installation date. All submittals shall be listed and sequenced within the Submittal Schedule in accordance with the approved Construction Schedule.
- C. The Architect and Owner will review the Submittal Schedule, provide revision comments and return it to the Contractor within fourteen (14) business days. If revisions are required, the Contractor shall then resubmit a revised Submittal Schedule to the Architect and Owner within fourteen (14) business days and thereafter until approved,
- D. Submittals, product data and samples submitted out of sequence to the approved Submittal Schedule or Construction Schedule will be subject to return as unchecked and required to be resubmitted at a date coinciding with these schedules. The Submittal Schedule is advisory only and shall not relieve the Contractor of the responsibility for accomplishing the Work within each and every Contract required Milestone and Completion date. Omissions and errors in the approved Submittal Schedule shall not excuse the Contractor from providing required submittals, product data or samples, nor excuse the Contractor from meeting the Contract required Milestones and Completion date.

### **3.06 SUBMITTAL DEFINITIONS AND REQUIREMENTS**

- A. Shop Drawing

1. Shop drawings, diagrams, schedules and other data specifically prepared for the work by the contractor, subcontractor, manufacturer, or supplier to illustrate some portion of the work.
- B. Product Data
  1. Product data are illustrations, standard schedules, performance charts, instructions, and brochures, furnished by the contractor to illustrate materials or equipment to illustrate some portion of the work.
- C. Sample
  1. Physical examples which illustrate materials for some portion of the work evaluated for product compliance.
- D. Color Sample
  1. Physical examples which illustrate color or texture for use in color selection.
- E. Submittal
  1. The submittal is the compilation of the shop drawing, product data, sample, color sample as requested by the specifications.

### **3.07 SUBMITTALS FOR REVIEW**

- A. Submittals to the Architect which are not listed below will not be reviewed by the Architect and will not be returned to the Contractor. Submittals required by specification section which are not listed in this section shall be reviewed by the Contractor.
- B. The Architects review of the Contractors submittal shall be limited to examination of an initial submittal and one resubmittal. The Architect's review of additional submittals, beyond that of the initial and resubmittal, will be made only with prior written approval of the Owner after notification by the Architect.
- C. Contractors review of submittals shall be consistent with A201 – General Conditions. Areas of deviation from the Contract Documents will be represented by revision clouds, Green in color, made by the General Contractor on the associated PDF document. In the event there are no clouded areas identified, it can be assumed that the associated submittal has been reviewed in full by the General Contractor and are deemed approved. No further review by the Architect is required.
- D. Samples
  1. Contractor shall submit all products which require a color selection. Contractor shall only submit actual product sample. Remainder of submittal shall be retained by contractor. Refer to color sample procedures below.
  2. Provide sample identical to the precise article proposed to be provided. If actual sample is not provided for substitution review, submittal will be rejected.
  3. Unless otherwise specified, submit one sample which will be retained by the Architect.
  4. Samples will be reviewed only for aesthetic, color, or finish selection.
- E. The Contractor may require his subcontractors to provide drawings, setting diagrams, and similar information to help coordinate the project, but such data shall remain between the Contractor and his subcontractors and will not be reviewed by the Architect.
- F. Where required by specification sections, provide submittals to the Contractor for review and approval. Contractor shall maintain a copy of all submittals at the project site.
- G. Fax submittals are not acceptable.
- H. Upon request by the Architect, Contractor shall submit additional items as required.
  1. Only the following listed items shall be submitted to the Architect for review:
    - a. Section 03 1000 – Concrete Forming and Accessories
      - 1) Shop Drawings - Construction joint plan
    - b. Section 03 2000 – Concrete Reinforcing
      - 1) Shop Drawings - Anchor bolt setting plan
      - 2) Shop Drawings - Grade beam, and slab reinforcing steel

- c. Section 03 3000 – Cast-In-Place Concrete
  - 1) Concrete Mix Designs
  - 2) Accessory products - Documentation indicated section 03 3000
- d. Section 03 3800 - Post-Tensioned Concrete
  - 1) Shop drawings with seal of professional engineer (Texas).
- e. Section 04 0511 - Mortar and Masonry Grout
  - 1) All proposed mortar and grout mix designs
- f. Section 04 2000 - Unit Masonry
  - 1) Reinforcement Shop Drawings
- g. Section 04 7200 – Cast Stone Masonry
  - 1) Shop drawings with seal of professional engineer (Texas).
- h. Section 05 1200 - Structural Steel Framing
  - 1) Shop drawings.
- i. Section 05 2100 – Steel Joist Framing
  - 1) Shop drawings.
- j. Section 05 3100 - Steel Decking
  - 1) Product Data - Deck type and finish
  - 2) Shop Drawings
- k. Section 05 4000 – Cold-Formed Metal Framing
  - 1) Shop drawings with seal of professional engineer (Texas).
- l. Section 05 4400 – Cold-Formed Steel Trusses
  - 1) Shop drawings with seal of professional engineer (Texas).
- m. Section 05 5100 – Metal Stairs
  - 1) Shop drawings with seal of professional engineer (Texas).
- n. Section 05 7000 - Decorative Metal
  - 1) Product Data – all components required per spec section.
  - 2) Shop Drawings – all components required per spec section.
- o. Division 07 - Thermal and Moisture Protection
  - 1) Product Data – all components required per spec section.
  - 2) Shop Drawings – all components required per spec section.
- p. Division 08 - Openings
  - 1) Product Data – all components required per spec section.
  - 2) Shop Drawings – all components required per spec section.
- q. Section 09 6429 – Wood Strip and Plank Flooring
  - 1) Product Data – all components required per spec section.
  - 2) Shop drawings – all components required per spec section.
- r. Section 09 6466 – Wood Athletic Flooring
  - 1) Product Data – all components required per spec section.
  - 2) Shop drawings – Court layouts/markings.
- s. Section 09 7223 – Custom Digital Wall Covering
  - 1) Product Data – all components required per spec section.
  - 2) Shop Drawings – all components required per spec section.
- t. Section 10 1400 – Signage
  - 1) Shop Drawings and sign copy layout
  - 2) Product Samples
- u. Section 10 5100 – Lockers
  - 1) Product Data – all components required per spec section.
  - 2) Shop Drawings – all components required per spec section.
- v. Section 10 7300 – Protective Coverings
  - 1) Shop drawings with seal of professional engineer (Texas).
- w. Section 11 2336 – Commercial Appliances
  - 1) Product Data – all components required per spec section.

- x. Section 11 4000 – Food Service Equipment
  - 1) Product Data – all components required per spec section.
  - 2) Shop Drawings – all components required per spec section.
  - 3) Parts Manuals - required for all equipment.
- y. Section 11 5300 - Laboratory Equipment
  - 1) Product Data - all components required per spec section.
  - 2) Shop Drawings - all components required per spec section.
- z. Section 11 6623 – Gymnasium Equipment
  - 1) Product Data – all components required per spec section.
- aa. Section 11 6843 – Scoreboards
  - 1) Product Data – all components required per spec section.
  - 2) Shop Drawings – all components required per spec section.
- bb. Section 12 3200 - Manufactured Wood Casework
  - 1) Product Data – all components required per spec section.
  - 2) Shop Drawings – all components required per spec section.
- cc. Section 12 3600 - Countertops
  - 1) Product Data – all components required per spec section.
  - 2) Shop Drawings – all components required per spec section.
- dd. Section 12 3551 - Musical Instrument Cabinet System
  - 1) Product Data - all components required per spec section.
  - 2) Shop Drawings - all components required per spec section.
- ee. Section 13 3416 – Grandstands and Bleachers
  - 1) Shop drawings with seal of professional engineer (Texas).
- ff. Section 13 3419 – Metal Building Systems
  - 1) Shop drawings with seal of professional engineer (Texas).
- gg. Section 14 2400 – Hydraulic Elevators
  - 1) Product Data – all components required per spec section.
  - 2) Shop Drawings – all components required per spec section.
- hh. Divisions 21, 22, 23, 26, 27, 28
  - 1) Product Data – all components required per spec section.
  - 2) Shop Drawings – all components required per spec section.
- ii. Division 31 - Earthwork
  - 1) Product Data – all components required per spec section.
  - 2) Shop Drawings – all components required per spec section.
- jj. Division 32 - Exterior Improvements
  - 1) Product Data – all components required per spec section.
  - 2) Shop Drawings – all components required per spec section.
- kk. Division 33 - Utilities
  - 1) Product Data – all components required per spec section.
  - 2) Shop Drawings – all components required per spec section.
- 2. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.
- 3. Samples will be reviewed only for aesthetic, color, or finish selection.
- 4. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.

### **3.08 SUBMITTALS FOR PROJECT CLOSEOUT**

- A. Within sixty (60) days following the Notice to Proceed, the Contractor shall submit a list of Expected Closeout Documents for review by the Architect. This list shall include project record documents, operation and maintenance data, warranties, bonds, contract forms, health/safe environment data, attic stock sign offs, Owner training, certifications and inspections, and other types as indicated. All items on the list shall be titled with spec section number and general description - Example: "09 3000 Tiling - 1 year warranty".
- B. The Architect will review the list of Expected Closeout Documents, provide revision comments and return it to the Contractor within fourteen (14) business days. If revisions are required, the Contractor shall then resubmit a revised list to the Architect and Owner within fourteen (14) business days and thereafter until approved.
- C. Contractor may submit Closeout Documents by Specification Division in full as scopes of work are completed.
- D. Submit Correction Punch List for Substantial Completion.
- E. Submit Final Correction Punch List for Substantial Completion.
- F. Submit for Owner's benefit during and after project completion.
- G. See Section's 01 7000 and 01 7800 for additional details.

### **3.09 NUMBER OF COPIES OF SUBMITTALS**

- A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
- B. Extra Copies at Project Closeout: See Section 01 7800.
- C. Samples: Submit one sample as specified in individual specification sections which will be retained by Architect. All other samples required by the individual specification section shall be retained by the Contractor.
  - 1. After review, Contractor shall produce duplicates if needed for other purposes.
  - 2. The Architect's sample will not be returned to Contractor.

### **3.10 SUBMITTAL PROCEDURES**

- A. General Requirements:
  - 1. Transmit using approved form.
  - 2. Acceptable Manufacturers
    - a. Manufacturers submitted shall be as per the acceptable manufacturers listed in each specification. For additional manufacturers requiring approval, reference Section 01 6000 – Product Requirements.
  - 3. Sequentially identify each item. For revised submittals use original number and a sequential alphabetical suffix.
  - 4. Submittals shall be numbered as follows:
    - a. Number shall be Architects project number followed by the appropriate specification section - consecutive submittal number for section.
    - b. Example - 1234-01-01 Tiling 09 3000 - 5.
    - c. When material is re-submitted for any reason, transmit under a new letter of transmittal and with a new transmittal number.
    - d. On re-submittals, cite the original submittal number for reference.
    - e. On at least the first page of each submittal, and elsewhere as required for positive identification, show the submittal number in which the item was included.
    - f. When multiple projects are administered under one contract, contractor shall submit separate submittals for each project. Failure to submit separately will result in a rejected submittal review.
    - g. Unless otherwise specified, make submittals in groups containing all associated items to assure that information is available for checking each item when it is received.



- 1) Partial submittals may be rejected as not complying with the provisions of the Contract.
- 2) The Contractor may be held liable for delays so occasioned.
- 3) Multiple projects bid under a single prime shall package submittals separately for each project.
5. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
6. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
  - a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
7. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
  - a. Upload submittals in electronic form to Electronic Document Submittal Service website.
8. Schedule submittals to expedite the Project, and coordinate submission of related items.
  - a. For each submittal for review, allow 14 days excluding delivery time to and from the Contractor.
9. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
10. Provide space for Contractor and Architect review stamps.
11. When revised for resubmission, identify all changes made since previous submission.
12. Revisions:
  - a. Make revisions required by the Architect.
  - b. If the Contractor considers any required revision to be a change, he shall so notify the Architect as provided for in the General Conditions.
  - c. Make only those revisions directed or approved by the Architect.
  - d. The contractor shall be responsible for delays caused by rejection of inadequate or incorrect submittals.
13. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
14. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
15. Submittals not requested will not be recognized or processed.
- B. Shop Drawing Procedures:
  1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
  2. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

### 3.11 ELECTRONIC DRAWING FILE REQUEST

- A. Upon Award of Contract:
  1. At the pre-construction meeting, Awarded Prime Contractor shall bring the executed electronic file release form for the original contract documents. The agreement forms can be found at the end of this Section. Upon the Prime Contractor executing and submitting the agreement to the Architect, the Architect will provide the Contractor one (1) electronic copy of the Revit® BIM Model file(s) **at no charge** within five (5) working days. **Note that CAD files associated with the work can be accessed and exported from the model provided to the General Contractor through the use of Revit® software; therefore, individual CAD files will not be provided by the Architect or its consultants.** Files and Formats to be as follows
    - a. Civil: Overall master file in AutoCAD format.

- 1) Overall site plan with utility and grading information
  - 2) All details, detail annotation and references are omitted and not part of the AutoCAD file.
- b. Structural: BIM Model (Revit) and associated working plan views.
  - 1) Plan views contain overall and enlarged plan section view set up of foundation, second floor framing and roof framing only. All plan views contain grids, dimensions and general annotation.
  - 2) All details, detail annotation and references are omitted and not part of the model file.
- c. Architectural: BIM Model (Revit) and associated working plan views.
  - 1) Project Specific BIM Dataset will include information pertaining to the Architectural Building Information Model including model(s), schedules, views, sheets, and details.
  - 2) All "working" views will be omitted and Huckabee title blocks will be replaced with Huckabee CONTRACTOR Title Block
- d. Mechanical, Electrical and Plumbing: BIM Model (Revit) and associated working plan views.
  - 1) Plan views contain overall and enlarged section plan view set up of mechanical, electrical lighting, electrical power and plumbing plans only.
  - 2) All details, detail annotation and references are omitted and not part of the model file.
- e. Technology: BIM Model (Revit) and associated working plan views.
  - 1) Plan views contain overall and enlarged section plan view set up showing all device locations and general annotation.
  - 2) All details, detail annotation and references are omitted and not part of the model file.
  - 3) Electronic files for Technology drawings will only be released to the Prime Contractor but will require signatures from both the Prime Contractor and the Technology Subcontractor on an additional Technology/Security release form.
2. The Revit® file provided to the Awarded Prime Contractor is NOT FOR CONSTRUCTION PURPOSES, but for convenience only. This BIM Model will consist of the original model utilized for base bid. It is the responsibility of the Awarded Prime Contractor to coordinate all accepted alternates, addenda, Requests for Information, Proposal Requests and any other changes realized during construction. The Architect will not provide up-to-date drawings sets or updated BIM Models to the Awarded Prime Contractor unless otherwise stated within the Owner/Architect agreement. If "conformed" documents are required by the Owner/Architect agreement they will be provided in (PDF) Portable Document Format. Conformed Construction Documents are the Construction Documents modified to include any addenda issued during the bidding or negotiation process. The AIA does not use the terms "conform set" or "conformed set" in its documents.
3. TO THE EXTENT CONFORMED CONSTRUCTION DOCUMENTS ARE PROVIDED TO THE CONTRACTOR REGARDING THE PROJECT, THE FOLLOWING PROVISIONS SHALL APPLY:
  - a. The Conformed Construction Documents and related information contained therein, are provided for the Contractor's (CONTRACTOR) convenience only, and does not relieve the CONTRACTOR from the requirements of Contract Documents which were issued for bid including any addenda. Specifically, to the extent that any discrepancy or conflict exists between the Issue for Bid documents including any Addenda (collectively referred to as the "Bid and Addenda Documents") on the one hand, and the Conformed Construction Documents on the other, the Bid and Addenda Documents shall control unless otherwise specified in writing by the Architect. Field verification of existing and as-built conditions are required as part of the submittal process as specified in this Section 01 3000 Administrative Requirements and Section 01 7000 Execution and Closeout Requirements.

- b. CONTRACTOR shall not to use such drawings, documents, or other data, in whole or in part, for any purpose or project other than the "PROJECT" in the preparation of shop drawings and other submittals.
- c. CONTRACTOR acknowledges that such drawings, documents, and other data are subject to change or modification. CONTRACTOR shall be responsible for updating any drawings, documents or other data obtained prior to use by them for any purpose.
- d. Any Conformed Construction Documents, including any drawings, documents, or other data related thereto, are provided, "AS IS" without representation or warranty by Architect, either express or implied.
- e. CONTRACTOR acknowledges that Conformed Construction Documents are being provided by ARCHITECT as a courtesy to CONTRACTOR, at their specific request, and accordingly CONTRACTOR DOES HEREBY AGREE TO RELEASE, HOLD HARMLESS, DEFEND AND INDEMNIFY ARCHITECT AND THE TOMBALL ISD (OWNER), FROM ANY AND ALL CLAIMS, DEMANDS, OR CAUSES OF ACTION, WHICH CONTRACTOR, OR ANY THIRD PARTY, MAY HAVE BY REASON OF ANY INJURY OR DAMAGE SUSTAINED BY CONTRACTOR OR SUCH THIRD PARTY ARISING OUT OF OR IN ANY WAY RELATED TO THE USE OF SUCH CONFORMED CONSTRUCTION DOCUMENTS.

### 3.12 PROGRESS PAYMENTS

- A. The submission and approval of progress updates and the reports calculating the value of work done for any given pay period for each activity based on the percentage complete for that activity less the amount previously paid for past percentages complete and percent of retainage shall be an integral part and basic element of the application upon which Progress Payments shall be made pursuant to the provisions of the General Conditions and/or Supplementary Conditions. The Contractor shall be entitled to progress payments only as determined from the current updated and approved Construction Schedule. Contractor shall submit (3) three original sets for the first and final applications for payment, with all original signatures of AIA form G702 and G703 (form G702/CMA is not acceptable). All other payment applications shall be submitted electronically as described in paragraph 3.01 Electronic Document Submittal Service.
  - 1. The initial and subsequent cost reports which are developed from the schedule of values shall include the following activity information:
    - a. Activity number and activity description.
    - b. Percentage of value of work in place against Total Value.
    - c. Total cost of each activity.
    - d. Value of work in place this period.
    - e. Value of work in place to date.
    - f. Value of uncompleted work.
    - g. Value of stored material not in place.
    - h. The cost report will be submitted as supporting documentation to the Contractor's application for payment. The application for payment shall be submitted as required by the Contract Documents.
    - i. Identify scopes of work (campuses/buildings) when applicable with a clear and concise heading.
    - j. Separate scopes of work with the appropriate heading per the 2016 MasterFormat standard.
    - k. "Description of Work" shall be identified by specification number and heading per 2016 MasterFormat standard while separating the "Labor" and "Material" costs throughout each line item in the scope of Work.
    - l. Include all associated contingencies and allowances expenditures.
      - 1) All contingency and allowance expenditures shall be listed sequentially and follow the same guidelines as noted below. "Description of Work" shall reflect the pricing exercise and identify contingency or allowance.
      - 2) Reference the example AIA Document G703 found at the end of this Section.

- m. In the event the Work is completed without the use of 100% of the the associated funds in the contract, column "H" or "Balance to Finish" shall represent the total dollar amount being credited back to the owner via AIA G701

### **3.13 CONTRACTOR'S DAILY FIELD REPORT**

- A. Daily reports shall be used to record a chronological, day-to-day account of the work force, the respective activities performed, the weather conditions, and any specific events that take place on the Project.
- B. The Daily Report shall not be used as a communication tool. Any situations requiring specific action shall be brought to the attention of the appropriate party by means of written correspondence, memoranda, or meeting minutes.
- C. Photographs shall be used with the Daily Report to clarify or confirm statements and concerns.
- D. The Contractor shall produce a Daily Report including the following information:
  - 1. Date.
  - 2. Weather, temperature, wind, and precipitation.
  - 3. Number of workers on site, listed by Subcontractor and Trade.
  - 4. Material and equipment deliveries.
  - 5. Construction quantities placed.
  - 6. General description of the Work accomplished.
  - 7. Specific problems encountered.
  - 8. Meetings held.
  - 9. List of visitors to the site and their companies.
  - 10. Construction photographs.
- E. NOTE: Provide Owner with copies of signed Daily Report at weekly progress meetings.

### **3.14 REQUEST FOR INFORMATION**

- A. Contract document interpretations or clarifications shall be submitted by the Contractor to the Architect in the form of a written request for information (RFI).
- B. RFIs shall be numbered sequentially and shall include only one question or related questions per RFI. If the Contractor's question or request for interpretation is already clearly defined or discernible in the contract documents, the RFI may be returned unanswered and the Architect may be entitled to additional compensation (from the Contractor) for review time.
- C. If the Contractor believes there may be additional contract cost or time incurred, it shall be stated in the RFI. If additional contract cost or time is required based on the RFI, the Architect will issue appropriate documentation for the proposed change. All changes in work shall be accomplished by approved change order only.
- D. The Architect will respond to the RFI in a reasonable and timely manner, within approximately seven (7) business days from the date the RFI is received and stamped by the Architect's office. No extension of contract cost or time will be allowed due to a delayed RFI submittal or the response to an RFI.

### **3.15 DEVELOPMENT OF ADVERSE WEATHER DATA**

- A. Unless adverse weather data is defined elsewhere in the contract for construction, provide as follows;
- B. Collection of Adverse Weather Data
  - 1. Weather data obtained from the National Oceanic and Atmospheric Administration (NOAA) shall form the baseline for estimating anticipated delays and project durations and determining the occurrence of unusually severe weather. Data shall be collected and compiled as follows:

- a. Contractor shall compile the number of days per month that the anticipated weather is expected to be adverse by analysis of NOAA. The last 5 years of consecutive data shall be used to establish the baseline of rain days per month associated with the project schedule duration. However, in the absence of 5 years of data, a shorter period may be used.
    - b. The compiled data shall be submitted with the Contractors Construction Schedule for documenting future weather events.
  2. Adverse Weather is defined as the occurrence of one or more of the following conditions within a twenty-four (24) hour day that prevents the Critical Path of construction activity exposed to weather conditions or access to the site:
    - a. Precipitation (rain, snow, or ice) in excess of one-quarter inch (0.25") liquid measure.
    - b. Temperatures that do not rise above that required for the day's construction activity, if such temperature requirement is specified or accepted as standard industry practice.
    - c. Sustained wind in excess of twenty-five (25) m.p.h.
    - d. Contractor shall take into account that certain construction activities are more affected by adverse weather and seasonal conditions than other activities, and that "dry-out" or "mud" days are not eligible to be counted as Weather Delay Day until the standard baseline is exceeded. Hence, Contractor should allow for an appropriate number of additional days associated with the Standard Baseline days in which such applicable construction activities are expected to be prevented and suspended.
  3. A Weather Delay Day may be counted if adverse weather prevents work on the project for fifty percent (50%) or more of the contractor's scheduled work day and Critical Path construction activities were included in the day's schedule, including a weekend day or holiday if Contractor has scheduled construction activity that day.
- C. Submission for Time Extension
1. Although the contractor is required to document the occurrence and effect of adverse weather on the work, it does not relieve the Contractor/Architect of its responsibility to investigate and determine if an excusable delay has occurred.
  2. The schedule of anticipated adverse weather delays included in the contract is established in work days. Similarly, actual weather data should be collected and recorded on a work day basis. Monthly summaries should be maintained indicating actual adverse weather conditions and the impact on work activities.
  3. To determine if any particular month experienced unusually severe weather, the number of actual adverse delay days is compared to that as provided by the NOAA database. If the number of actual delay days is greater than that in the contract the contractor has experienced unusually severe weather.
  4. THE DETERMINATION THAT UNUSUALLY SEVERE WEATHER OCCURRED DOES NOT AUTOMATICALLY MEAN THAT THE CONTRACTOR RECEIVES A TIME EXTENSION FOR THE DIFFERENCE OF DAYS BETWEEN THE ANTICIPATED AND ACTUAL ADVERSE WEATHER DELAY DAYS. Further analysis is necessary to determine if the unusually severe weather delayed work activities critical to contract completion. The contractor's progress schedule must be evaluated to make this determination. If it is found that unusually severe weather delayed the contract, a contract modification shall be issued pursuant to Gov. Code 2269

5. Claims for increase in the contract time shall set forth in writing the detail noting the circumstances that form the basis for the claim, the date upon which each cause of delay began to affect the progress of the work, the date upon which each cause of delay ceased to affect the progress of the work and the number of days increase in the contract time claimed as a consequence of each such cause of delay. The Contractor shall bear the entire economic risk of all weather delays and disruptions, and shall not be entitled to any increase in the Contract Price by reason of such delays or disruptions. Requests for an extension of time pursuant to this Subparagraph shall be submitted to the Architect in writing not later than the fifteenth (15th) day of the month following the month during which the delays or disruptions occurred, and shall include documentation demonstrating the nature and duration of the delays or disruptions. Where appropriate, a revised construction schedule indicating all the activities affected by the circumstances shall be included with the documentation.

**END OF SECTION**



## MORE THAN ARCHITECTS

### ELECTRONIC DOCUMENT RELEASE FORM

*Instructions: Transmitting party to fill out all fields and send to receiving party for signature prior to transmitting electronic documents.*

Date: ENTER DATE

Transmitting Party: Huckabee  
Address: 801 Cherry Street, Suite 500 Fort Worth, Texas 76102  
Phone: (817) 377-2303  
Representative: ENTER NAME & TITLE

Receiving Party: COMPANY NAME  
Address: ENTER ADDRESS  
Phone: ENTER PHONE NUMBER  
Representative: NAME & TITLE

Project: ENTER PROJECT NUMBER AND NAME

The purpose of this Agreement is to grant a license from Huckabee, henceforth referred to as the Transmitting Party to the Receiving Party for the Receiving Party's use of Digital Data on the Project, and to set forth the license terms. The Receiving Party acknowledges the following:

#### Article 1 General Provisions

1. For the purposes of this Agreement, the term Digital Data is defined to include only those items identified in Article 3 in accordance with the terms and conditions set forth in this Agreement.
2. The Digital Data is provided as is, in the native format used by the Transmitting Party. By transmitting the Digital Data, the Transmitting Party makes no warranty, representation, or guaranty that the information provided therein is complete, accurate or compatible with the Receiving Party's software and hardware systems.
3. The Digital Data, and the information contained therein is provided "as is" for the Receiving Party as a convenience only. The Digital Data is not a Contract Document and shall not be solely relied upon by the Receiving Party for any purpose.
4. The Receiving Party shall keep the Digital Data strictly confidential and shall not disclose it to any other person or entity except as set forth in Item Number 5 below.
5. The Receiving Party may disclose the Digital Data as required by law or court order. The Receiving Party may also disclose the Digital Data to its employees, consultants, or contractors to perform services or work solely and exclusively for the Project, provided those employees, consultants and contractors are subject to the restrictions on the disclosure and use of Digital Data as set forth in this Agreement.
6. To the fullest extent permitted by law, the Receiving Party shall indemnify and defend the Transmitting Party from and against all claims arising from or related to the Receiving Party's modification to, or unlicensed use of, the Digital Data.
7. This Hold Harmless Agreement shall be attached to and transmitted with the Transmitted Digital Data at all times so that those that the Receiving Party allows to have access are bound by the terms of this Agreement.





CONTINUATION SHEET

AIA DOCUMENT G703

PAGE OF PAGES

APPLICATION NO:  
APPLICATION DATE:  
PERIOD TO:  
ARCHITECTS PROJECT NO:

PROJECT NAME:

A	B	C	D		E	F	G		H		I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED			MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G ÷ C)	BALANCE TO FINISH (C - G)	RETAINAGE (IF VARIABLE RATE)	
			FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD							
Division 01 — General Requirements											
	General Conditions & Staff	\$0.00		\$0.00	\$0.00	\$0.00	\$0.00	#DIV/0!	\$0.00	\$0.00	
1	Payment & Performance Bonds						\$0.00	#DIV/0!	\$0.00	\$0.00	
2	Etc.						\$0.00	#DIV/0!	\$0.00	\$0.00	
Building 1											
Division 2 - Existing Conditions											
	02 4100-Demolition - Labor						\$0.00	#DIV/0!	\$0.00	\$0.00	
11	02 4100-Demolition - Material						\$0.00	#DIV/0!	\$0.00	\$0.00	
12	Etc.						\$0.00	#DIV/0!	\$0.00	\$0.00	
Division 3 - Concrete											
	03 1000-Concrete Forming and Accessories - Labor						\$0.00	#DIV/0!	\$0.00	\$0.00	
21	03 1000-Concrete Forming and Accessories - Material						\$0.00	#DIV/0!	\$0.00	\$0.00	
22	Etc.						\$0.00	#DIV/0!	\$0.00	\$0.00	
Include all associated divisions, continue sequentially											
Contingency Expenditures											
61	PR#001 City Comments - Allowance						\$0.00	#DIV/0!	\$0.00	\$0.00	
62	PR#002 Storm Water Relocate - Contingency						\$0.00	#DIV/0!	\$0.00	\$0.00	
Building 2											
Division 2 - Existing Conditions											
88	02 4100-Demolition						\$0.00	#DIV/0!	\$0.00	\$0.00	
	Complete additional lines per scope						\$0.00	#DIV/0!	\$0.00	\$0.00	
Contingency Expenditures											
167	PR#021 Additional Marker Boards - Allowance						\$0.00	#DIV/0!	\$0.00	\$0.00	
							\$0.00	\$0.00	\$0.00		
	GRAND TOTALS	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	#DIV/0!	\$0.00	\$0.00	



**SECTION 01 3216**  
**CONSTRUCTION PROGRESS SCHEDULE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Preliminary schedule.
- B. Construction progress schedule, bar chart type.

**1.02 RELATED SECTIONS**

- A. Section 01 1000 - Summary of Work.

**1.03 REFERENCE STANDARDS**

- A. AGC (CPSM) - Construction Planning and Scheduling Manual 2004.
- B. M-H (CPM) - CPM in Construction Management - Project Management with CPM 2015.

**1.04 SUBMITTALS**

- A. Within 14 days after date established in Notice to Proceed, submit preliminary schedule defining planned operations.
- B. If preliminary schedule requires revision after review, submit revised schedule within 7 days.
- C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
  - 1. Include written certification that major Subcontractors have reviewed and accepted proposed schedule.
- D. Within 10 days after joint review, submit complete schedule.
- E. Submit updated schedule with each Application for Payment.
- F. Submit the number of opaque reproductions that Contractor requires, plus two copies that will be retained by Architect.
- G. Submit under transmittal letter form specified in Section 01 3000 - Administrative Requirements
- H. Approval by the Owner and Owner's Representatives of the Contractor's Construction Schedule is advisory only and shall not relieve the Contractor of the responsibility for accomplishing the Work within each and every Contract-required Milestone and Completion date. Omissions and errors in the approved Construction Schedule shall not excuse performance, which is not in compliance with the Contract. Approval by the Owner and Owner's Representatives in no way makes the Owner or Owner's Representatives an insurer of the Construction Schedule's success or liable for time or cost overruns flowing from its shortcomings. The Owner hereby disclaims any obligation or liability by reason of Owner or Owner's Representatives approval of or acquiescence to the Construction Schedule.
- I. It is to be expressly understood and agreed by the Contractor that the schedule is an estimate to be revised from time to time as progress proceeds, and that the Owner does not guarantee that Contractor can start work activities on the early or late start dates or complete work activities on the early finish or late finish date shown in the schedule, or as same may be updated or revised; nor does the Owner or Owner's Representative guarantee that Contractor can proceed at all times in the sequence established by said schedule. If Contractor's schedule indicates that Owner or a separate contractor is to perform an activity by a specific date, or within a certain duration, Owner or any separate contractor under contract with Owner shall not be bound to said date or duration unless Owner expressly and specifically agrees, in writing, to same; the Owner's and / or the Owner's Representative's overall review and approval or acceptance of the schedule does not constitute an agreement to specific dates, duration or sequences for activities of the Owner or any separate contractor.

### **1.05 QUALITY ASSURANCE**

- A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with three years minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.
- B. Contractor's Administrative Personnel: three years minimum experience in using and monitoring CPM schedules on comparable projects.

### **1.06 SCHEDULE FORMAT**

- A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.
- B. Diagram Sheet Size: Width required.
- C. Sheet Size: Multiples of 8-1/2 x 11 inches.
- D. Scale and Spacing: To allow for notations and revisions.

## **PART 2 PRODUCTS - NOT USED**

## **PART 3 EXECUTION**

### **3.01 PRELIMINARY SCHEDULE**

- A. Prepare preliminary schedule in the form of a horizontal bar chart.

### **3.02 CONTENT**

- A. Critical Path Method (CPM) to show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Identify each item by specification section number.
- C. Identify work of phases, separate stages or proposed occupancies and other logically grouped activities.
- D. Provide sub-schedules for each stage of Work identified in Section 01 1000 - Summary.
- E. Include contract milestone dates and completion dates as specified in the contract.
- F. Provide sub-schedules to define critical portions of the entire schedule.
- G. Include conferences and meetings in schedule.
- H. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
- I. Provide separate schedule of submittal dates for shop drawings, product data, and samples, owner-furnished products, products identified under Allowances, and dates reviewed submittals will be required from Architect. Indicate decision dates for selection of finishes.
- J. Indicate delivery dates for owner-furnished products and Owner furniture or equipment scheduled for salvage and/or relocation in project.
- K. Indicate testing of materials.
- L. Indicate activity periods for punch list.
- M. Indicate the work to be performed during the facility's scheduled holidays, weekends, or summer recess periods.
- N. Coordinate content with schedule of values specified in Section 01 3000.
- O. Provide legend for symbols and abbreviations used.

### **3.03 BAR CHARTS**

- A. Include a separate bar for each major portion of Work or operation.
- B. Identify the first work day of each week.

- C. The schedule diagram shall be a time-scaled drawing.
- D. The Construction Schedule Detailed Reports, initial submittal and subsequent updates or revisions, shall indicate each of the following:
  - 1. Description of activity including activity number/numbers.
  - 2. Estimated duration time or remaining duration for each activity.
  - 3. Early start date for each activity.
  - 4. Late start date for each activity.
  - 5. Early finish date for each activity.
  - 6. Late finish date for each activity.
  - 7. Float available for each path of activities containing float.
  - 8. Actual start date for each activity begun.
  - 9. Actual finish date for each activity completed.
  - 10. Identification of all critical path activities in the mathematical analysis.
  - 11. The critical path for the Project, with said path of activities being clearly and easily recognizable on the time-scaled graphic diagram, and the relationship between all non-critical activities and activities on the critical path shall be clearly shown on the graphic diagram.
  - 12. The dollar value of each activity in relation to the schedule of values. This may be shown on a separate cost report.
  - 13. The responsibility code for the Contractor or Subcontractor performing each activity or portion thereof.
  - 14. The percentage complete of each activity in progress or complete.

#### **3.04 SCHEDULE OF OFF-SITE ACTIVITIES**

- A. The Contractor shall include in his Construction Schedule all procurement related activities which lead to the delivery of materials to the site in a timely manner. Upon written approval by the Project Manager, these activities may be submitted as a separate Off-Site Activities Schedule, properly correlated to the Construction Schedule. The schedule of off-site activities shall include, but is not limited to, the following:
  - 1. Dates for submittals, ordering, manufacturing or fabricating, and delivery of equipment and materials. Long lead items requiring more than one month between ordering and delivery to site shall be clearly noted;
  - 2. All significant activities to be performed by the Contractor during the fabrication and erection/installation in a Contractor's plant or on a job site, including materials/equipment purchasing, delivery; and
  - 3. Contractor's drawings and submittals to be prepared and submitted to the architect.
- B. The Contractor shall be solely responsible for expediting the delivery of all material to be furnished by him so that the construction progress shall be maintained according to the current schedule for the Work.
- C. The Owner's Representatives shall be advised, in writing, by the Contractor whenever it is anticipated by the Contractor that the delivery date of any material and/or equipment furnished by the Contractor for installation will be later than the delivery date shown on the schedule, subject to schedule updates.
- D. Submittals, equipment orders and similar items are to be treated as schedule activities, and shall be given appropriate activity numbers.

### **3.05 FLOAT TIME**

- A. Float or slack time is defined as the amount of time between the earliest start date and the latest start date or between the earliest finish date and the latest finish date of an activity or a chain of activities on the Construction Schedule. Float or slack time is not for the exclusive use or benefit of either the Contractor or the Owner. Contractor's work shall proceed according to early start dates, and the Owner's Representatives shall have the right to reserve and apportion float time according to the needs of the Project. The Contractor acknowledges and agrees that actual delays, affecting paths of activities containing float time, will not have any affect upon Contract completion times, providing that the actual delay does not exceed the float time associated with those activities.
- B. Extensions of time for performance as described in the Contract Documents will be granted only to the extent that time adjustment for the activity or activities affected by any condition or event which entitles the Contractor to a time extension exceed the total float or slack along the path of activities affected at the time of Notice to Proceed of a Change Order or the commencement of any delay or condition for which an adjustment is warranted under the Contract Document.

### **3.06 SCHEDULE UPDATES AND REPORTS**

- A. Every month, in conjunction with the monthly application for payment, the Contractor shall submit an updated graphic diagram and an updated detailed schedule report from the Construction Schedule and updated Record Documents. Contractors Application for Payment shall not be approved for payment unless schedule is attached and Record Documents are current. The schedule shall be updated to show actual progress and the effect of delays and other events. The actual start and finish dates shall be included in the detailed report, as well as the actual dates of the Milestone events.
- B. The content of the updated Construction Schedule shall be equal to that noted in Section 1.02 Construction Schedule.
- C. The updated Construction Schedule submitted by Contractor shall not show a completion date later than the Contract Completion Date, subject to any time extensions approved by Owner.

### **3.07 REVIEW AND EVALUATION OF SCHEDULE**

- A. Participate in joint review and evaluation of schedule with Architect at each submittal.
- B. Evaluate project status to determine work behind schedule and work ahead of schedule.
- C. After review, revise as necessary as result of review, and resubmit within 7 days.

### **3.08 UPDATING SCHEDULE**

- A. Maintain schedules to record actual start and finish dates of completed activities.
- B. Indicate progress of each activity to date of revision, with projected completion date of each activity.
- C. Update diagrams to graphically depict current status of Work.
- D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
- E. Indicate changes required to maintain Date of Substantial Completion.
- F. Submit reports required to support recommended changes.
- G. Provide narrative report to define problem areas, anticipated delays, and impact on the schedule. Report corrective action taken or proposed and its effect including the effects of changes on schedules of separate contractors.

### **3.09 RECOVERY SCHEDULE**

- A. Should the Contractor's Construction Schedule indicate that the progress of the work is behind schedule to the extent that any of the mandatory specific or milestone dates or completion dates are in jeopardy the Contractor shall be required to, at no extra cost to the Owner, prepare and submit to the Owner's Representatives within 72 hours, a Recovery Plan, in a form and detail appropriate to the need and explain and display how he intends to reschedule those activities to regain compliance with the Construction Schedule.

### **3.10 SCHEDULE REVISIONS**

- A. Should the Contractor, after approval of the initial Construction Schedule, desire to change his plan in construction, he shall submit his required revisions to the Owner's Representatives along with a written statement of the revisions including a description of the logic for rescheduling the work, methods of maintaining adherence to intermediate Milestones and Specific Dates and the reasons for the revisions. The Contractor shall revise his schedule to include the effect of changes, acts of God, and other conditions or events, which have affected the Schedule. If the requested changes are acceptable to the Owner and Owner's Representatives, the changes will be incorporated into the Construction Schedule in the next reporting period.
- B. When the Owner orders changes by change Order which have the potential to impact the Contract Milestones or Specific Dates stipulated in the Supplemental Conditions, a Schedule will be prepared by the Contractor and provided to the Owner's Representatives for concurrence or revision. After the proposed schedule revision has been mutually agreed upon, it will be incorporated into the Construction Schedule. Change Order logic will affect only those activities and performance data directly concerned. Adjustments in Scheduled intermediate Completion Dates or for the Contract as a whole will be considered only to the extent that there is insufficient remaining float to absorb these changes.
- C. Any change to the approved Construction Schedule must be approved, in writing, by the Owner and Contractor.
- D. Neither the updating or revision of Contractor's Construction Schedule nor the submission, updating, change or revision of any report or schedule submitted to Owner's Representatives by Contractor under this Section nor Owner's review or non-objection of any such report or schedule shall have the effect of amending or modifying, in any way, the Contract Time, any Contract Completion Date, or Contract Milestone Dates or of modifying or limiting in any way Contractor's obligations under this Contract.

### **3.11 REQUESTED TIME ADJUSTMENT SCHEDULE**

- A. The updated Construction Schedule submitted by Contractor shall not show a completion date later than the Contract Time, subject to any time extensions approved by Owner:
  - 1. Provided, however, that if Contractor believes he is entitled to an extension of the Contract Time under the Contract Documents, Contractor shall submit to Owner's Representatives, with each progress payment update, a separate schedule analysis (entitled "Requested Time Adjustment Schedule") indicating suggested adjustments in the Contract Time which should, in the opinion of Contractor, be made in accordance with the Contract Documents by time extension, due to changes, delays or conditions occurring during the past month or previously, or which are expected or contemplated by Contractor (whether such conditions are excusable under the Contract or are alleged to be due to Contractor or Owner fault); this separate schedule, if submitted, shall be time-scaled utilizing a computer generated and computer-drawn Schedule analysis schedule, unless otherwise approved by the Owner's Representative and shall be accompanied or preceded by a formal time extension request as required by the Contract and a detailed narrative justifying the time extension requested.
- B. The time extension request shall include schedule forecasts that predict the actual Project Completion Date, and any separable portions thereof specified by Owner plus a forecast of the actual achievement of any milestones listed in the Owner-Contractor Agreement.

- C. To the extent any time extension requests are ending at the time of any update in the Construction Schedule, the "Requested Time Adjustment Schedule" shall also be updated each month, to reflect any adjustments made by Contractor in the logic, sequence or duration of any activities in the Construction Schedule, or any time extensions previously granted by Owner, and to reflect actual or expected progress, in order that the "Requested Time Adjustment Schedule" shall clearly and accurately reflect Contractor's Actual intention and proposed time adjustments as of the latest update.
- D. Neither the Owner, the Project Manager or the Architect shall have any obligation to consider any time extension request unless the requirements of the Contract Documents, and specifically, but not limited to these requirements, are complied with; and Owner shall not be responsible or liable to Contractor for any constructive acceleration due to failure of Owner to grant time extensions under the Contract Documents should Contractor fail to substantially comply with the submission requirements and the justification requirements of this Contract for time extension requested. Contractor's failure to perform in accordance with the Construction Schedule shall not be excused, nor be chargeable to Owner, because Contractor has submitted time extension requests or the "Requested Time Adjustment Schedule".

### **3.12 DISTRIBUTION OF SCHEDULE**

- A. Distribute copies of updated schedules to Contractor's project site file, to subcontractors, suppliers, Architect, Owner, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

**END OF SECTION**



**SECTION 01 4000  
QUALITY REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Submittals.
- B. Quality assurance.
- C. References and standards.
- D. Testing and inspection agencies and services.
- E. Contractor's construction-related professional design services.
- F. Contractor's design-related professional design services.
- G. Control of installation.
- H. Mock-ups.
- I. Tolerances.
- J. Manufacturers' field services.
- K. Defect Assessment.

**1.02 RELATED REQUIREMENTS**

- A. Document 00 3132 - Geotechnical Data
- B. Section 01 4516 - Contractor Quality Control. Testing and Inspection services.
- C. Section 01 4533 - Code-Required Quality Control.

**1.03 CONTRACTOR'S CONSTRUCTION-RELATED PROFESSIONAL DESIGN SERVICES**

- A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.
- B. Provide such engineering design services as may be necessary to plan and safely conduct certain construction operations.

**1.04 CONTRACTOR'S DESIGN-RELATED PROFESSIONAL DESIGN SERVICES**

- A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract. Contractor, and its Delegated Design Professional, shall be responsible for coordinating with the Design-Related Professional Design Services with the Architect.
- B. Base design on performance and/or design criteria indicated in individual specification sections. Design shall be coordinated with and or compatible with all other applicable elements, materials, products, and or components in the Contract Documents.
  - 1. Submit a Request for Information to Architect if the criteria indicated are not sufficient to perform required design services.
  - 2. Submit a Request for Information for any issue necessary to fully and properly coordinate and complete the design in accordance with the Contract Documents.
- C. Contractor's Delegated Design Professional shall be responsible for code compliance of all aspects of the Delegated Design whether or not all codes and or their specific code requirements are specifically identified and or called out in the Contract Documents.
- D. Contractor shall coordinate with, and obtain written approval from, the Architect for any Delegated Design results that modify the original intent of the Contract Documents regarding occupancy, aesthetics, function, performance, or any design feature.
- E. Contractor shall promptly provide written notification to the Architect when Contractor becomes aware of any errors and or omissions regarding the Contractor's professional design services.

- F. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by the Contractor or the Delegated Design Professional. The Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.
- G. Shop drawing sheets that include engineering information designed by the Contractor's Delegated Design Engineer shall be signed and sealed in accordance with the Texas Engineering Practice Act. Sheets that do not provide information designed by the Contractor's Engineer do not require being signed and sealed. Calculation packages require a signed and sealed cover sheet only. Any submittals requiring to be signed and sealed that are received without the signature and seal will be rejected without review.

#### **1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures, including but not limited to submittal review responsibilities.

#### **1.06 QUALITY ASSURANCE**

- A. Designer Qualifications: Where professional engineering design services and design data submittals are specifically required of Contractor by Contract Documents, provide services of a Professional Engineer experienced in design of this type of work and licensed in Texas.
  - 1. The General Contractor or Construction Manager shall comply with the Texas Professional Services Procurement Act when selecting an Engineer for Delegated Design Services.

#### **1.07 REFERENCES AND STANDARDS**

- A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.
- C. Obtain, review and comply with copies of standards where required by product specification sections.
- D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
- F. Neither the contractual relationships, duties, or responsibilities of the Owner, Architect, Contractor or any of their respective subconsultants or subcontractors shall be altered from Contract Documents by mention or inference otherwise in any reference document.

#### **1.08 TESTING AND INSPECTION AGENCIES AND SERVICES**

- A. A Special Inspection and Testing Agency (SITA) will perform field quality control tests and inspections, as specified in specification Section 01 4516 - Contractor's Quality Control and Section 01 4533 - Code-Required Quality Control.

### **PART 2 PRODUCTS - NOT USED**

### **PART 3 EXECUTION**

#### **3.01 CONTROL OF INSTALLATION**

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.

- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

### **3.02 MOCK-UPS**

- A. Before installing portions of the Work where mock-ups are required, construct mock-ups for each form of construction and finish required, using materials indicated for the completed Work. The purpose of mock-up is to demonstrate the proposed range of aesthetic effects and workmanship.
- B. Integrated Exterior Mock-ups: Construct integrated exterior mock-up. Coordinate installation of exterior envelope materials and products as required in individual Specification Sections. See Section 04 2000-Unit Masonry for additional mock-up requirements for field sample panels and integrated envelope and wall assembly.
- C. Integrated Room Mock-ups: Construct integrated room mock-ups for one room type of each classroom, office, and restroom. Mock-ups shall include the scope per contract documents along with Owner furnished equipment.
- D. Obtain Owner and Architect's approval of mock-ups before starting work, fabrication, or construction.
  - 1. Make corrections as necessary until Owner and Architect's approval is issued.

### **3.03 TOLERANCES**

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate beyond the maximum overall allowable tolerance level.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

### **3.04 MANUFACTURERS' FIELD SERVICES**

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Architect 30 days in advance of required observations.
  - 1. Observer subject to approval of Architect.
  - 2. Observer subject to approval of Owner.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

### **3.05 DEFECT ASSESSMENT**

- A. Replace Work or portions of the Work not complying with specified requirements.
- B. If, in the opinion of Architect and Owner, it is not practical to remove and replace the Work, Owner will direct an appropriate remedy or adjust payment.

### **END OF SECTION**



**SECTION 01 4100  
REGULATORY REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SUMMARY OF REFERENCE STANDARDS**

- A. Related Documents: General and Supplementary Conditions of the Contract, Division 01 General Requirements, and Drawings are applicable to this Section.
- B. Section Includes, but is not limited to:
  - 1. Permits and fees.
  - 2. Code and regulatory compliance for the associated Work.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 4000 - Quality Requirements.

**1.03 PERMITS AND FEES**

- A. The Owner will pay for all City and/or State Building Permits, Impact Fees, and other Building Fees related to the project. The Contractor and Subcontractors will be responsible for obtaining all required trade permits or license fees.
- B. Once General Contractor is in possession of the final construction permits (building permits), Contractor shall be responsible for submitting to the AHJ, approved request for pricing (RFP), change orders, or other documents that contain significant changes to the contract until construction is complete. Contractor shall pay for permits or fees associated with any required changes.

**1.04 BUILDING CODES**

- A. Building Code Compliance: Reference drawings for year editions used in document design.
  - 1. Building Code – International Building Code
  - 2. Plumbing Code – International Plumbing Code
  - 3. Mechanical Code – International Mechanical Code
  - 4. Electrical Code – National Electrical Code
  - 5. Life Safety Code – NFPA 101
- B. Energy Code Compliance
  - 1. Energy Code – International Energy Code.
  - 2. Contractor shall provide, at the jobsite office, one copy of the completed energy code review.
  - 3. Contractor shall notify energy code plan review company for all required energy inspections.
    - a. Milestones for inspections shall be as follows:
      - 1) Envelope: Building cladding is substantially complete, windows are delivered and installed, roof insulation has been installed and if possible is visible, interior finish of exterior walls has not been installed so any exterior wall insulation is visible
      - 2) ME rough-in: Mechanical ductwork is substantially installed, equipment is set, lighting fixtures are installed, ceiling is open (equivalent to an above-ceiling inspection)
      - 3) Final: Final verification of all mechanical, lighting, controls, envelope as installed and commissioned. Envelope penetrations (e.g. doors, windows) are closed, roof is complete.
    - b. Contact Information:
      - 1) Building Solutions  
9401 Lyndon B. Johnson Freeway, Suite 410  
Dallas, Texas, 75243  
Phone: 214.221.9145

C. Accessibility Compliance

1. Accessibility requirements are from the 2012 ADA Standards for Accessible Design, and the 2012 Texas Accessibility Standards of the Architectural Barriers Act.
2. The information contained in this section is provided to identify the modifications provided for users who are not served by adult standards. It shall be the Contractors responsibility to be familiar with the standards and to apply the standards to all aspects of the project.  
Any apparent conflict between current standards and the drawings shall be brought to the architect's attention for clarification. The information in the drawings does not release the contractor from full compliance with the latest TAS requirements.
3. Contractor shall provide, at the jobsite office, one copy of the 2012 Texas Accessibility Standard (TAS) regulations as prepared by the Texas Department of Licensing and Regulation, concerning handicap accessibility. The Contractor shall conform to the regulations as set forth in the TAS. Copies can be obtained at Texas Department of Licensing and Regulation, P.O. Box 12157, Austin, TX; 512-539-5669 / Fax 512-539-5690; [www.license.state.tx.us](http://www.license.state.tx.us). Copies may be downloaded from <http://www.license.state.tx.us/ab/abtas.htm>.
4. Federal Register:
  - a. Vol. 56, No. 144, July 26, 1991, Rules and Regulations; Appendix A to part 36 – Standards for Accessible Design.
  - b. 5 U.S.C. 552(a) and 1 C.F.R. part 51, Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Building Elements Designed for Children's Use.
5. Texas Accessibility Standards
  - a. The Elimination of Architectural Barriers Texas Government Code, Chapter 469, effective March 15, 2012.

## 1.05 ACCESSIBILITY REQUIREMENTS

A. General

1. All general TAS standards apply and staff-use areas and spaces for the use of students above the age of 12 shall be designed for adult users. In facilities for younger students, adult-use spaces will commonly be identified by their name (MEN, WOMEN, STAFF TLT, etc). Juvenile-use spaces will be likewise identified (BOYS, GIRLS, STU TLT, etc.).
2. Besides the transition to adult dimensions for students above the age of 12, some requirements vary additionally, depending on age. Refer to the tables enclosed for the varying heights and spacing required.
3. Age/Grade ranges are interpreted as follows:
  - a. Ages 3 years and 4 years / Pre-Kindergarten
  - b. Ages 5 years thru 8 years / Kindergarten thru 3rd Grade
  - c. Ages 9 years thru 12 years / 4th Grade thru 7th Grade
  - d. Over 12 years / 8th Grade thru Adult

B. Dimensional Tolerances

1. Contractor is reminded that while the TAS guidelines allow for "construction and manufacturing tolerances" there is no "definition" of what that tolerance is, therefore, where TAS gives a single absolute dimension, every effort should be made to equal that dimension. Where TAS provides a dimensional range, or a minimum or a maximum, there is NO construction tolerance. Any dimension less than the minimum or more than the maximum will be rejected upon inspection and subject to correction.

## 1.06 QUALITY ASSURANCE

- A. Contractor's Designer Qualifications: Refer to Section - 01 4000 - Quality Requirements.

## **PART 2 PRODUCTS**

### **2.01 GENERAL**

- A. Contractor shall note that no regulatory agency designates products with a formal "ADA Approved" designation. Contractor shall be responsible for ensuring all products are reviewed for accessibility compliance.

## **PART 3 EXECUTION**

### **3.01 REPAIR**

- A. Non-Compliant Work
  - 1. The Contractor shall be responsible for removing and correcting all work that is found to be in non-compliance.
  - 2. The Contractor shall perform all work at no expense to the Owner.
  - 3. The Contractor shall be responsible to perform all repairs regardless of the date at which the non-compliant items are found.
- B. The work shall be performed such that there will be no disruption to the Owner schedule.

**END OF SECTION**





**SECTION 01 4339  
MOCK-UP WALL CONSTRUCTION**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. An Envelope Pre-construction meeting shall be held with all of the subcontractors responsible for erecting the envelope related materials.
  - 1. Attendees shall include (but are not limited to): General Contractor, framing and sheathing subcontractor, masonry subcontractor, weather barrier subcontractor, storefront and glazing subcontractor, roofing and sheet metal subcontractors, metal wall panel subcontractors, mechanical and electrical subcontractors, and any other trade that will install products in the exterior building envelope, or penetrate through the exterior envelope.
- B. Work includes: Constructing in-place mock-up, including all reviewed submittals required by the Contract Documents, to establish compliance with the design intent as well as the specified requirements to provide a complete and watertight facility.
- C. Providing a photo manifest of as-built conditions as the mock-up is being constructed. Photos shall be kept at the job site during construction for reference. All Photos shall be documented on a plan of the mock up, where they were taken.
- D. Mock-up fabrication must be completed and reviewed and approved by the Owner and Architect prior to starting installation of building envelope construction.

**1.02 RELATED REQUIREMENTS**

- A. Individual sections of these specifications for each material indicated for use in the mock-up wall construction.

**1.03 SUBMITTALS**

- A. Section 01 3000 – Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate dimensions, layout, joints, construction details, methods of anchorage, etc. as required for items to be installed in the mock-up wall construction.
- C. All submittals for materials required in the mock-up walls shall be approved prior to beginning work on the mock-up wall construction.
- D. Provide a compatibility matrix of all envelope materials to be used on the project.
- E. Provide required test reports for envelope materials.

**1.04 PURPOSE**

- A. The mock-up wall panels are to be constructed as indicated on the drawings, including toothed masonry construction to allow exposed flashings, etc. Construction of the mock-up walls are intended to:
  - 1. Provide an acceptable quality standard for the completed work.
  - 2. Identify color and finish selections of the various materials used, as well as the acceptable range of color and variations within those materials.
  - 3. Establish the required coordination between trades and the sequence of necessary installations to provide a complete and watertight building envelope.

**1.05 QUALITY ASSURANCE**

- A. Coordination of product submittals and construction installation:
  - 1. Prior to each submittal, carefully review and coordinate all aspects of each item being submitted.
  - 2. Verify that each item being submitted is in conformance in all respects with the specified requirements.
  - 3. By affixing the Contractor's signature to each submittal for the mock-up, the contractor certifies that this coordination has been performed.

4. Contractor shall construct the site built mock-up with the same manner of specified construction as the new construction.
5. Contractor shall construct the site built mock-up with the same workmanship and quality as being implemented on the new construction.
6. All material to be installed shall be reviewed by architect and consultants for conformance.

## **PART 2 – PRODUCTS**

### **2.01 MOCK-UP REQUIREMENTS**

- A. Build in-place mock-ups to verify selections made under sample submittals and to demonstrate aesthetic effects and qualities of materials and execution. Mock-up wall construction shall be coordinated by the General Contractor and constructed by the subcontractor responsible for the actual construction work. All conditions and materials to be used on the job shall be included in the mock-up. Build mock-ups to comply with the listed requirements, using materials indicated for the completed Work. Construction of mock-up shall be complete 60 days minimum, prior to installation of cladding materials at the primary structure.
- B. Contractor shall start the construction of the mock-up based on, but not limited to, the following list:
  1. Foundation if subgrade is present
  2. Waterproofing membrane
  3. Dampproofing material
  4. Flexible Through-Wall Flashing Membrane
  5. Metal Through-Wall Flashing
  6. Preformed Flashing Pieces
  7. Face Brick with Mortar and Weeps
  8. CMU with mortar and weeps
  9. Wall Ties
  10. Weather Barrier
  11. Portland Cement Plaster
  12. Metal Panels, Wall and Soffit
  13. Metal Roof Panels
  14. Low Slope Roof System
  15. Weeps
  16. Window Unit with flexible flashing membrane
- C. Samples and Manufacturer's Submittals: Submit prior to delivery or installation.
  1. Samples of all building system components including all specified accessories.
  2. Submit samples of proposed warranties complete with any addenda necessary to meet the warranty requirements as specified.
  3. Submit latest edition of manufacturer's specifications and installation procedures. Submit only those items applicable to this project.
  4. A written statement from the materials manufacturer approving the installer, specifications and drawings as described and/or shown for this project and stating the intent to guarantee the completed project.
  5. Follow submitted shop drawings, product data of all sheet metal.
- D. Scale and Measurements: Make Shop Drawings accurately to a scale sufficiently large enough to show all pertinent aspects of the item and its method of connection to the work.
- E. Shop Drawings and Product Data: Provide manufacturer's approved details of all conditions, projection conditions, and any additional special job conditions which require details other than indicated in the drawings.
  1. Manufacturer's Details: All termination details and other details normally required by the manufacturer's Technical Specifications, including both standard details and special details, shall be furnished by the Contractor and shall be approved in writing by the manufacturer, the company project manager, and the Owner's representative prior to final installation.

- F. Provide manufacturer's approved details, of all perimeter conditions, project conditions, and any additional special job conditions which require details other than indicated in the drawings.

## **2.02 MANUFACTURER'S LITERATURE**

- A. Work provided on the mock-up shall follow all of the submitted literature from manufacturers.
- B. Manufacturer's literature shall be the minimum for basis of design and shall be in conjunction with construction documents. All manufacturers' warranties shall remain in effect as specified.

## **2.03 SAMPLES**

- A. Provide sample or samples identical to the precise article proposed to be provided.

## **2.04 COLORS AND PATTERNS**

- A. Unless the precise color and pattern are specifically called out in the Contract Documents, and whenever a choice of color or pattern is available in the specified products, submit accurate color and pattern charts to the Architect/Project Manager for selection in advance of the Envelope Pre-Construction meeting.
- B. Contractor shall coordinate with Architect for exact layout or design of patterns and textures and how they are to be installed on the mock-up.

# **PART 3 – EXECUTION**

## **3.01 ENVELOPE PRE-CONSTRUCTION MEETING**

- A. Begin construction of mock-up wall prior to envelope pre-construction meeting, at location determined by Architect. Progress should be sufficient to review installation of weather barrier and flashings as part of envelope pre-construction meeting.
- B. Convene a minimum of one week prior to initiation of the mock-up wall construction. Size and location of in-place mock-up to be determined at this meeting.
- C. Verify that all required submittals have been approved and that color/finish selections have been made.
- D. Establish coordination between trades and establish sequencing of material installations to ensure a complete and watertight assembly.
- E. Distribute meeting minutes and agreed upon sequencing to all subcontractors.
- F. Construct mock-up walls in accordance with the established procedures and installation sequencing.

## **3.02 INSTALLATION OF MATERIALS**

- A. Contractor shall install all materials on mock-up in same manner required for the main structure. Refer to specification sections for basis of design of all material being installed on this mock-up.
- B. During installation, Contractor shall maintain a photo manifest of mock-up construction for Architect and Owner to review.
- C. Quality of installation is of utmost importance and shall be monitored for completeness and conformance with the design intent and manufacturer's installation recommendations.
- D. Once mock-up is complete, it shall be reviewed by the Architect and Owner's Representative for conformance to construction documents.
- E. Contractor shall install material in same sequencing as required by industry standards.

## **3.03 INSTALLATION OF WINDOWS AND ASSOCIATED FLASHING**

- A. Installer shall coordinate the installation of the window with associated trades to maintain proper compatibility of material.
- B. Installation shall be in accordance with referenced specifications.
- C. Install all perimeters flashing as detailed to create a sealed air and watertight condition.

- D. Once window flashing and weather barrier have been installed, but prior to the installation of cladding, Contractor shall notify Architect, Owner and Consultants for review for conformance and shall coordinate a water test of surrounding flashings per Division 08. Contractor shall notify Architect, Owner and Consultants to observe the testing. All tests shall be in accordance with referenced specifications.

#### **3.04 INSTALLATION OF FLASHING AT THROUGH-WALL LOCATION**

- A. Installer shall coordinate the installation of the wall flashing with associated trades to maintain proper compatibility of material.
- B. Installation shall be in accordance with referencing specifications.
- C. Once flashing has been installed, Contractor shall notify Architect, Owner and Consultants for review for conformance.

#### **3.05 QUALITY ASSURANCE**

- A. Air Barriers
  - 1. Conduct wet film thickness readings throughout application of the membrane to confirm compliance with manufacturers requirements.
  - 2. At transitions between materials provided by different manufacturers provide adhesion testing of the air/weather barrier by a third party agency per ASTM D4541, *Test Method for Pull-off Strength for Coatings Using Portable Adhesion Testers* at a minimum of (1) location for each transition condition;
    - a. The manufacturer shall provide the minimum pull off strength in pounds per square inch (psi). In the event that the manufacturer cannot provide this data, the minimum pull off strength considered "passing" shall be 100 pounds per square inch.
- B. Sealant Joints
  - 1. Provide sealant adhesion testing, with and without primer, at various substrate conditions, as required by the specifications and/or manufacturer's instructions included as part of the product submittals.
  - 2. Submit report to Architect.
- C. Glazing Systems
  - 1. Provide specified testing of the glazing system by a third party testing agency. Provide minimum of one (1) test per each specification section. In the event multiple tests are specified, the most stringent test shall be required at the mock-up condition.

#### **3.06 CONSTRUCTION SCHEDULE**

- A. Once installation sequences have been determined and mock-up wall construction has been approved, modify the Construction Schedule to reflect the established sequencing of material installations and testing requirements. Distribute revised schedule.

**END OF SECTION**

**SECTION 01 4516**  
**CONTRACTOR'S QUALITY CONTROL**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Control of installation.
- B. Testing and inspection services by one or more quality assurance laboratories to be employed by the Contractor (if these services are not provided by subcontractors or material suppliers).  
The purpose of quality assurance services are so that the Contractor can verify work is done properly during construction, before the Contractor requests that the Owner's Independent Quality Control Agency performs code-required special inspections, tests and structural observations. The Contractor's QA Laboratory testing and inspection services shall include, but not be limited to:
  - 1. Testing, inspection, and certifications specified in sections of Project Manual other than Section 01 4533. This quality assurance testing shall be paid by the Contractor.
  - 2. Earthwork borrow pit material verification
  - 3. Concrete mix design verification
  - 4. Masonry unit compressive strength verification
  - 5. Structural Steel quality assurance recommended by AISC
  - 6. HVAC Testing and Balancing
  - 7. Indoor Air Quality Testing
  - 8. Certification of No Asbestos Containing Materials
- C. References and standards.
- D. Manufacturers' field services.

**1.02 RELATED REQUIREMENTS**

- A. Document 00 3132 - Geotechnical Data
- B. Section 01 3000 - Administrative Requirements: Submittal procedures.
- C. Section 01 4000 - Quality Requirements
- D. Section 01 4533 - Code Required Quality Control
- E. Section 01 6000 - Product Requirements: Requirements for material and product quality.

**1.03 REFERENCE STANDARDS**

- A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008 (Reapproved 2014).
- B. ASTM C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation; 2014.
- C. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2013.
- D. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2012a.
- E. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2014a.
- F. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2013.
- G. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2010.

**1.04 QUALITY ASSURANCE (OF CONTRACTOR'S QUALITY ASSURANCE LABORATORY)**

- A. Contractor's QA Laboratory Qualifications and Procedures:

1. Meet "Recommended Requirements for Independent Laboratory Qualification," latest edition published by American Council of Independent Laboratories. Testing agencies shall meet the requirements of ASTM E 329, "Recommended Practice for Inspection and Testing Agencies for Concrete, Steel and Bituminous Materials as Used in Construction" and ASTM E 543, "Determining the Qualification of Nondestructive Testing Agencies."
2. The inspection and testing services of the testing agency shall be under the direction of a Registered Engineer licensed in the State of Texas, charged with engineering managerial responsibility, and having at least five years engineering experience in inspection and testing of construction materials.
3. Inspecting personnel monitoring concrete work shall be ACI certified inspectors.
4. Submit copy of report of inspection of facilities made by Materials Reference Laboratory of National Bureau of Standards during most recent tour of inspection. Include memorandum of remedies of deficiencies reported by this inspection.
5. Testing Equipment: Calibrated at reasonable intervals by devices of accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.
6. Tests and inspections shall be conducted in accordance with specified requirements and if not specified, in accordance with applicable standards of the American Society for Testing and Materials and other recognized authorities as approved.
7. Primary inspectors performing structural steel inspection shall be currently certified AWS Certified Welding Inspectors (CWI), in accordance with the provisions of AWS QCI, "Standard and Guide for Qualification and Certification of Welding Inspectors." The inspector may be supported by assistant inspectors who may perform specific inspection functions under the supervision of the inspector. Assistant inspectors shall be currently certified AWS Certified Associate Welding Inspectors (CAWI). The work of assistant inspectors shall be regularly monitored by the inspector, generally on a daily basis.

#### **1.05 REFERENCES AND STANDARDS**

- A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.
- C. Obtain copies of standards where required by product specification sections.
- D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
- F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

#### **PART 2 PRODUCTS - NOT USED**

#### **PART 3 EXECUTION**

##### **3.01 CONTROL OF INSTALLATION**

- A. See Section 01 4000 - Quality Requirements

##### **3.02 GENERAL REQUIREMENTS FOR CONTRACTOR'S LABORATORY SERVICES**

- A. The Contractor shall perform various tests as required in the various specification sections for conference to the construction documents other than those in Section 01 4533. The Owner maintains the right to verify the test results with an independent testing lab.
- B. Contractor's design testing and certification testing includes:
  1. Testing defined in this Specification Section.

2. Testing when source of material is changed after initial tests have been performed.
3. Other testing required by other Sections of the Specifications.

### **3.03 EARTHWORK**

- A. Earthwork: Identify suitable material at borrow material location, sampling soil material, and testing of soil material samples.

### **3.04 DRILLED PIERS**

- A. The Contractor shall provide all equipment, materials and labor required for the Test Pier Holes specified in Section 31 6329.

### **3.05 ACIP PILES**

- A. The Contractor shall provide all equipment, materials and labor required for any ACIP Pile Load Tests specified in Section 31 6316.

### **3.06 CONCRETE**

- A. Furnish concrete mix designs, in accordance with ACI 301, Section 3.9, made by an independent testing laboratory or qualified concrete supplier. Where mix designs by an independent testing laboratory are required, the laboratory shall be selected by the Contractor, approved by the Architect, and paid by the Contractor.

### **3.07 MASONRY**

- A. Furnish laboratory testing from the manufacturer or a Contractor-hired laboratory that verifies the compressive strengths of masonry units comply with specifications.
- B. Absorption Tests:
  1. Perform a field of test for water absorption on three representative clay units and at least once for each 5,000 square feet of wall before laying.
  2. The field test shall consist of drawing a one inch diameter circle with a wax pencil (the diameter of a quarter). Place thirty (30) drops of water from a medicine dropper in rapid succession with the circle. If all of the water is absorbed into the brick in less than 60 seconds, the units shall be deemed "to dry" and shall be prewetted.

### **3.08 STRUCTURAL STEEL**

- A. Provide current welder certifications for each welder to be employed.
- B. Performing certified welding procedure qualification and re-qualification testing specified in Section 05 1200, 05 2100, 05 3100, 05 4000, 05 4400, 05 5000 and 13 3419 and as recommended by the American Welding Society.
- C. Testing of materials when mill certificates are unavailable.

### **3.09 HVAC TESTING AND BALANCING**

- A. The Contractor shall provide complete testing and balancing services for all HVAC and control systems to be carried out by an independent certified testing and balancing (TAB) agency under a separate and direct contract with the General Contractor. Scope of testing and balancing services, Contractor obligations, etc. shall be in accordance with Testing, Balancing and Commissioning specification section.

### **3.10 INDOOR AIR QUALITY TESTING**

- A. The Contractor shall provide complete air quality testing services for the project to be carried out by an independent certified agency under a separate and direct contract with the General Contractor. Scope of testing services, Contractor obligations, etc. shall be in accordance with Section 01 5719 – Indoor Air Quality Requirements.

### **3.11 CERTIFICATION OF NO ASBESTOS CONTAINING MATERIAL**

- A. The Contractor shall provide the Architect a written certification of the following;
  1. Hazardous material-free construction – certify that no asbestos containing material was used and/or incorporated into the project during construction.

2. The statement shall be as follows:
  - a. The undersigned, pursuant to the General and Supplementary Conditions of the Contract for Construction, hereby certifies that to the best of his/her knowledge, information and belief, the materials incorporated into the project and as used during the construction process are free of any type of asbestos material, lead, polychlorinated biphenyl (PCB) or other materials identified by governmental agencies as being hazardous.

**3.12 MANUFACTURERS' FIELD SERVICES**

- A. See Section 01 4000 - Quality Requirements

**3.13 DEFECT ASSESSMENT:**

- A. See Section 01 4000 - Quality Requirements

**END OF SECTION**



**SECTION 01 4533**  
**CODE-REQUIRED QUALITY CONTROL**

**PART 1 GENERAL**

**1.01 IMPORTANT NOTE FOR ALL PLAN REVIEWERS (AHJ) TO READ BEFORE ISSUING A BUILDING PERMIT!**

- A. This Section (Specification Section 01 4533) is the "Statement of Special Inspections, Testing, Structural Observations and Commissioning" for this project and is hereby submitted to the building official for review and approval. This statement has been prepared collaboratively by the Architect and appropriate Design Professionals such that the registered design professional responsible for the design of each portion of the work considered the requirements of Chapter 17 of the International Building Code (IBC), considered the Commissioning requirements of the International Energy Conservation Code, considered the nature of the work, and then customized this statement specifically for this project based on their professional opinion of what they recommend for the code-required quality control plan. In some instances, the special inspections, testing and/or structural observation required by this statement are significantly less than the special inspections, testing and/or structural observations that would be required by the IBC without Exception #1 in IBC Section 1704.2 which states special inspections, tests, and/or structural observations are not required for construction as warranted by conditions in the jurisdiction as approved by the building official. This customized quality control plan also includes some variations from procedures required by IBC Chapter 17, such as submitting certain items to Registered Design Professionals in lieu of the AHJ; these variations are based on procedures that AHJ's have indicated are preferred and also the experience of the Registered Design Professionals which indicates that this quality control plan (including these procedural variations) will meet or exceed the local standard of care. It is our understanding that the AHJ has the authority to allow these procedural variations on code-required quality control because the AHJ has the authority to waive the entire quality control plan under Exception #1 in IBC Section 1704.2. According to IBC Section 105.3.1, "If the application or the construction documents do not conform to the requirements of pertinent laws, the building official shall reject such application in writing, stating the reasons therefor. If the building official is satisfied that the proposed work conforms to the requirements of this code and laws and ordinances applicable thereto, the building official shall issue a permit therefor as soon as practicable." Therefore, if a building permit is issued without written notification that this statement or a portion thereof is rejected, it will be understood that this Statement of Special Inspections, Testing, Structural Observations and Commissioning is acceptable in the opinion of the building official, who has the authority to render interpretations of the code according to IBC Section 104. For clarification, this Statement includes the information required by IBC Section 1704.5 to be submitted to the AHJ before commencement of structural observations.
- B. Chapter 17 of the International Building Code requires that the AHJ approve Special Inspection and Testing Agency (SITA) staff qualifications and requires that discrepancies identified during construction be resolved in order to comply with the building code. Based on Huckabee's experience with numerous AHJ's, it is understood that, instead of the AHJ directly reviewing these qualifications and resolutions, it is acceptable to the AHJ for Registered Design Professionals to determine whether or not SITA staff qualifications are acceptable and determine what resolutions to discrepancies identified during construction comply with the building code, without soliciting the opinion of the AHJ. And, for clarification, some discrepancies that occur during construction often include scenarios in which the specified scope for a quality control agency was not performed due to the Owner not hiring an agency to do some portion of the scope, inaction by the Contractor, inaction by the hired quality control agency or a miscommunication between parties. Therefore, it shall be considered acceptable for the Registered Design Professionals for each respective design discipline to be considered the sole determinant of acceptable quality control agency qualifications and resolutions of discrepancies and not report these details to the AHJ, if a building permit is issued without written notification that this understanding is incorrect.

## **1.02 OWNER-PREPARED DOCUMENTS**

- A. Sections 01 1400 and 01 4533 require that the Owner participate in the preparation of certain documents (e.g. Owner Agreement with the SITA) before critical construction schedule milestones. Proposers shall assume for proposal purposes that the Owner will provide these documents or provide all necessary participation of these documents without causing a delay to the construction schedule. However, the Contractor shall notify the Owner in writing 45 days before such a document is necessary to avoid a delay, notifying the Owner in writing of the deadline necessary to avoid a delay.

## **1.03 REQUIREMENTS FOR QUALITY CONTROL**

- A. Requirements for Quality Control:
  - 1. Special inspections and testing services shall be provided by an agency to be selected and employed by the Owner, which is referred to herein as the Special Inspection and Testing Agency (SITA). The SITA may subcontract other firms to provide quality control services on behalf of the SITA as necessary; however, the SITA shall be responsible for providing directly or indirectly all of the SITA responsibilities defined in Section 01 4533.
  - 2. Commissioning services shall be performed by the Commissioning Agent (CxA) as specified in Division 01 and Divisions 22-26.
  - 3. As a general part of the Code-Required quality control plan, Design Professionals shall be notified at appropriate times and allowed to make site visits and visual observations for general conformance with the contract documents.
  - 4. It shall not be required to notify and obtain approval from the AHJ if alternative arrangements are made in hiring firm(s) to provide quality assurance services (e.g. Owner hiring multiple firms, Architect acting as the Owner's Agent and hiring the SITA, Owner hiring the Structural Observer, etc...)
  - 5. Each type of quality control service shall be considered separate from every other type of quality control service. The services by one quality control firm do not relieve the responsibility of the other quality control firm to provide their quality control services.

## **1.04 RELATED REQUIREMENTS**

- A. Document 00 3132 - Geotechnical Data
- B. Section 01 1400 - Work Restrictions: Work restrictions related to quality assurance.
- C. Section 01 3000 - Administrative Requirements: Submittal procedures.
- D. Section 01 4000 - Quality Requirements.

## **1.05 DEFINITIONS**

- A. Authority Having Jurisdiction (AHJ): The agency or individual officially empowered to enforce the building, fire and life safety code requirements of the permitting jurisdiction in which the Project is located. Where the term "building official" is used, it shall refer to the AHJ
- B. Code or Building Code: 2015 Edition of the International Building Code and documents referenced by that document.
- C. Commissioning Agent (CxA): The agent specified to perform the Commissioning specified in Division 01 and Divisions 22-26.
- D. Design Professionals: For the purposes of Section 01 4533, the term "Design Professionals" shall refer to every Design Professional responsible for the design, or making recommendations regarding the design, of any portion of the project, including but not limited to the Geotechnical Engineer, professionals that sealed drawings on the Contract Documents, as well as any professionals hired by the Contractor. (Examples on some projects may be the Geotechnical Engineer, Architect, Civil Engineer, Structural Engineer, Mechanical Engineer, Electrical Engineer, Contractor's Cold Formed Metal Framing Engineer, Contractor's Pre-Manufactured Canopy Engineer, Contractor's Pre-Engineered Metal Building Engineer, Contractor's Precast Concrete Engineer, etc...)

- E. Special Inspection and Testing Agency (SITA): The agencies responsible for providing all required special inspections and testing defined by Section 01 4533.
  - 1. Where used in the contract documents, the following terms (if used) shall also refer to the Special Inspection and Testing Agency (SITA):
    - a. "Special Inspection Agency"
    - b. "Construction Materials Engineering Firm"
    - c. "Construction Materials Testing Firm"
    - d. "Owner's Testing Laboratory"
    - e. "Independent Testing Laboratory"
- F. Special Inspections and Tests: The Special Inspections and Tests for this project are the inspections and tests required by Section 01 4533. These special inspections and tests are independent of any inspections and tests conducted directly by Tomball, ISD or Contractor.
- G. Quality control observations: For the purposes of Section 01 4533, the term "quality control observations" shall refer to the observations by the following quality control personnel:
  - 1. CxA
  - 2. Design Professionals
- H. Quality control observers: For the purposes of Section 01 4533, the term "quality control observers" shall refer to the personnel acting on behalf of the firms providing quality control observations.
- I. Quality control personnel: For the purposes of Section 01 4533, the term "quality control personnel" shall refer to the personnel acting on behalf of the following as they perform quality control services associated with Section 01 4533:
  - 1. SITA
  - 2. CxA
  - 3. Design Professionals
- J. Quality control services: For the purposes of Section 01 4533, the term "quality control services" shall refer to the services required by Section 01 4533 to be performed by the quality control personnel.

#### **1.06 REFERENCE STANDARDS**

- A. ACI 318 - Building Code Requirements for Structural Concrete and Commentary ; 2011.
- B. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement ; 2015.
- C. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field ; 2012.
- D. ASTM C172/C172M - Standard Practice for Sampling Freshly Mixed Concrete ; 2010.
- E. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel ; 2008.
- F. AWS D1.4/D1.4M - Structural Welding Code - Reinforcing Steel ; 2011.
- G. IAS AC89 - Accreditation Criteria for Testing Laboratories ; 2010.
- H. IAS AC291 - Accreditation Criteria for Special Inspection Agencies ; 2012.
- I. AASHTO R18 - Accreditation for Materials Testing Laboratories

### 1.07 APPROVAL OF SITA QUALIFICATIONS AND SCOPE

- A. SITA Qualifications: Before performing any SITA services on this project, the SITA shall submit to the Architect a statement for approval by the Architect indicating that the SITA firm and SITA Staff that will be assigned to this project will meet the following qualifications. The SITA shall indicate the years of experience performing similar work if a listed certification is not held by any proposed personnel (e.g. "We will only assign staff to this project that meets the listed certifications in Section 01 4533 with the exception that our masonry inspection and testing personnel have at least 10 years of experience performing masonry inspection and testing on similar projects but do not have a TMS Certification"):
1. It shall be required that the Special Inspections and Testing Agency (SITA) be accredited by IAS according to IAS AC291 and IAS AC89, or be accredited by AASHTO (or AMRL) unless the SITA obtains written approval of their experience performing inspection and testing services on similar projects by the Architect.
  2. It shall be required that the Construction Materials Engineer be a Professional Engineer with Construction Materials Engineering experience that is licensed in the State of Texas.
  3. It shall be required that the Concrete Inspection Technicians be at least certified ACI (American Concrete Institute) Concrete Field Testing Technicians-Level I, unless the SITA obtains written approval of the technician's experience performing concrete inspection services on similar projects by the Structural Engineer.
  4. It shall be required that the Concrete Testing Technicians be at least certified ACI (American Concrete Institute) Concrete Laboratory Testing Technicians-Level I, unless the SITA obtains written approval of the technician's experience performing concrete testing services on similar projects by the Structural Engineer.
  5. It shall be required that the Masonry Inspection Technicians be at least certified International Code Council (ICC) Structural Masonry Special Inspector unless the SITA obtains written approval of the technician's experience performing masonry inspection services on similar projects by the Structural Engineer.
  6. It shall be required that the Masonry Testing Technicians be at least certified International Code Council (ICC) Structural Masonry Special Inspector unless the SITA obtains written approval of the technician's experience performing masonry testing services on similar projects by the Structural Engineer.
  7. It shall be required that the Steel Inspection and Testing Technicians (for both Structural Steel Framing as well as Cold Formed Metal Framing) be certified Associate Welding Inspectors as defined by AWS (American Welding Society) or have a higher certification by AWS unless the SITA obtains written approval of their experience performing inspection and testing services on similar projects by the Structural Engineer.
    - a. Steel Inspection Technicians shall have passed within the last 2 years an eye examination with or without corrective lenses to verify the Technician has near vision acuity of Snellen English or equivalent at no less than 12 inches, and far vision acuity of 20/40 or better.
    - b. Steel Inspection Technicians inspecting bolts shall have a minimum 2 years of experience inspecting bolts as part of regular inspections of structural steel systems.
    - c. Steel Testing Technicians performing non-destructive testing of welds other than visual shall be certified NDT Level II Technicians in accordance with the American Society for Nondestructive Testing Recommended Practice No. SNT-TC-1A.
  8. It shall be required that the Technician providing special inspection services regarding firestopping at penetrations and joints be an IFC-Certified Inspector with a complete certificate indicating that the technician has passed the online exam and has complete the hands-on product training from at least four (4) firestop product manufacturers, or have written approval by the Architect of experience performing similar inspection services. It shall be permitted for "similar inspection" to be inspection of sprayed fire-resistant material if this experience is supplemented by a certificate or card indicating the technician has completed manufacturer's training on the firestopping material submitted and approved for use on this project.

9. It shall be required that the individual(s) performing any inspection or testing services associated with sprayed fire resistant material (SFRM), mastic and intumescent fire-resistant coatings shall be Certified Fire Inspector I (CFI) by the National Fire Protection Association (NFPA) unless the SITA obtains written approval that the technician's experience performing similar inspections and testing services by the Architect.
- B. SITA Scope: Before performing any SITA services on this project, the SITA shall submit to the Architect a statement (e.g. a copy of a fully executed agreement between the Owner and the SITA, or an email from the Construction Materials Engineer to the Architect) for approval by the Architect, indicating that the SITA will perform all work specified in Section 01 4533 to be performed by the SITA. An example of an acceptable statement is, "Our firm will provide all work specified in Section 01 4533 to be performed by the SITA for the [insert project name] located at [insert project address], Huckabee project number [insert project number]."
- C. It shall be permitted for the SITA to provide one statement regarding both qualifications and scope.

#### **1.08 APPROVAL OF CXA QUALIFICATIONS AND SCOPE**

- A. CxA Qualifications: Before performing any CxA services on this project, the CxA shall submit to the Mechanical and Electrical Engineers a statement for approval by the Mechanical and Electrical Engineers indicating that the CxA firm and CxA Staff that will be assigned to this project will meet the qualifications required by Division 01 and Divisions 22-26.
- B. CxA Scope: Before performing any CxA services on this project, the CxA shall submit to the Mechanical and Electrical Engineers a statement (e.g. a copy of a fully executed agreement, or an email from the CxA) for approval by the Mechanical and Electrical Engineers, indicating that the CxA will perform all work specified in Division 01, Section 01 4533 and Divisions 22-26 to be performed by the CxA. An example of an acceptable statement is, "Our firm will provide all work specified in Division 01, Section 01 4533 and Divisions 22-26 to be performed by the CxA for the [insert project name] located at [insert project address], Huckabee project number [insert project number]."
- C. It shall be permitted for the CxA to provide one statement regarding both qualifications and scope.

#### **1.09 CONTRACTOR'S GENERAL RESPONSIBILITIES**

- A. It shall be the Contractor's sole responsibility to comply with all requirements of the Contract Documents, without relying on any of the quality control services required by Section 01 4533. The purpose of quality control services is to simply provide some verification that the Contractor is complying with the Contract Documents.
- B. As required by the International Building Code, the Contractor shall submit to Tomball, ISD, the Building Official (AHJ), and the Architect a written "Acknowledgement of Contractor's Responsibilities Related to Code-Required Quality Control".
  1. This statement shall identify this project as " Project Title", including Architect's project number.
  2. The statement shall either include the following language or similar language: "As the Construction Firm responsible for the construction of this project, we acknowledge that we are aware of all the requirements of Specification Sections 01 1400 and 01 4533. In addition, we acknowledge that all firms currently under contract as Subcontractors to our firm on this project are also aware of the requirements of Specification Sections 01 1400 and 01 4533. We further acknowledge that we will make any firms we contract with in the future for this project also aware of these requirements prior to commencement of their scope of work."
- C. If any steel fabrication occurs off-site (at a fabrication shop) that is not an AISC certified fabrication shop, the Steel Fabricator shall pay for the SITA to perform the special inspections or testing required by Section 01 4533 for all such off-site steel fabrication.

- D. The Contractor shall notify quality control personnel at least five (5) business days before they need to visit the site to perform their services. In addition, the Contractor shall cooperate with quality control personnel, provide incidental labor, equipment and facilities to give them access to the work (including ladders and lifts), and provide space onsite for their operations and storage.
  - 1. If the Contractor does not request quality control services where required, the work that was not inspected and/or tested shall be considered deficient and the Contractor shall issue an RFI to the Architect immediately when the Contractor becomes aware of this deficiency.
- E. The Contractor shall make accessible and visible all work requiring quality control services until all deficiencies are corrected or otherwise fully addressed.
- F. Addressing Deficiencies in SITA Reports: The Contractor shall fully address all deficiencies noted by the SITA and notify the SITA when and how each deficiency was addressed. It shall be permitted to either correct the work in the presence of the SITA, provide evidence to the SITA that there was in fact no deficiency if that is the case, provide evidence to the SITA that the appropriate Design Professional(s) have determined that the deficiency from the contract documents is acceptable, or provide evidence to the quality control entity (e.g. SITA, CxA, or the respective design professional) that a remediation plan was approved by the appropriate Design Professional(s) and then constructed.
- G. Addressing Quality Control Observations:
  - 1. The Contractor shall be responsible for addressing any observations verbally noted by Design Professionals during site visits as if these observations were noted in writing. If the Contractor would like a written record of those observations, the Contractor shall submit a record of their understanding of the conversation to the Architect and Design Professional.
  - 2. The Contractor shall be responsible for determining if any observations identify or provide evidence of any deficiencies (discrepancies from the contract documents).
  - 3. All deficiencies associated with observations by Design Professionals shall be addressed by the Contractor.
  - 4. Except for items noted by a Design Professional that are identified in an observation report as "registered", the Contractor is not required to notify the Design Professional when deficiencies that are associated with observations by Design Professionals have been addressed in good faith by the Contractor. It shall be acceptable for the Contractor to address such items by correcting the discrepancy from the contract documents or determining that a deficiency does not in fact exist. Alternatively, it shall also be acceptable for the Contractor to issue an RFI proposing acceptance of the deficiency or a remediation, and then remediating if approved.
    - a. If the Design Professional requests at any time written correspondence that the Contractor has addressed deficiencies associated with any or all observations, the Contractor shall determine whether or not such deficiencies were addressed, resolve any deficiencies that were in fact not yet addressed, and then provide written correspondence indicating that all deficiencies associated with observations by the Design Professional have been corrected when all deficiencies have been corrected.
  - 5. The Contractor shall correct or otherwise fully address all items noted by Design Professionals that are identified in an observation report as "registered". After registered items have been corrected or otherwise fully addressed but before the Contractor is permitted to install construction which obstructs view of the correction or noted condition, the Contractor shall submit to the Design Professional acceptable evidence of how the item was addressed. The Design Professional shall be the sole determinant of what is considered acceptable evidence and the Design Professional may require a follow-up site visit to make observations. Examples of acceptable evidence might be a photograph emailed by the Contractor, a report from the SITA, or a conversation with the Architect's representative.

- H. If deficiencies are brought to the Contractor's attention by quality control personnel, the Contractor shall issue a Request For Information (RFI) to the Architect if direction is needed to resolve the item. This RFI shall include the Contractor's suggested course of action to address the deficiency. Unless the Contractor completely removes nonconforming work and replaces it with conforming work, it is the Contractor's responsibility to hire design professionals as required to design any remediation preferred by the Contractor, to be submitted to the Architect for consideration. This RFI may also include a request for acceptance of the deficiency based on an evaluation by the appropriate project design professional(s) such as the Structural Engineer of Record. The entire cost and schedule impact of any deficiencies identified by inspections and/or tests shall completely be the responsibility of the Contractor, at no additional cost to Tomball, ISD. Tomball, ISD reserves the right to assess liquidated damages associated with any and all delays due to addressing deficiencies.
1. If the Contractor would like Design Professional(s) such as the Structural Engineer of Record to design a remediation in lieu of the Contractor hiring design professionals, it shall be permitted for the Contractor to make this request in the RFI. However, project design professional(s) shall have no obligation to design any remediation and shall be permitted to charge for design services. The Contractor shall provide a deadline for the requested design in the RFI, or it may be assumed that the schedule of this resolution is not time-sensitive. If the project design professional(s) do not produce an approved remediation design by this deadline (even if there is no response to the RFI), the Contractor shall either remove nonconforming work and replace it with conforming work or hire design professionals to design a preferred remediation to be submitted for consideration by the Architect. The Contractor shall be responsible for any delays due to attempts by project design professional(s) to design remediation's by the requested deadline.
- I. The Contractor shall pay for all re-inspections and re-tests performed after quality control personnel have identified deficiencies, regardless of who is paying for the basic quality control services. The Contractor shall also pay for any tests, inspections and/or observations not required by Section 01 4533 but requested by the Contractor.
- J. The Contractor shall be responsible for paying (either directly or by reimbursing the Owner or Architect) for all additional services by quality control personnel associated with addressing deficiencies.
1. Design Professionals shall be permitted to bill the Contractor at their standard hourly rates and it shall be the Contractor's responsibility to realize that the Contractor shall be responsible for paying for any time a Design Professional spends performing additional services such as responding to RFI's regarding deficiencies, attending meetings regarding deficiencies, making site visits to address deficiencies.
  2. In general, many Design Professionals do not charge for these services; however, on this project, Design Professionals shall be permitted to bill or not bill the Contractor at their discretion and the Contractor shall be required to pay all such bills.
  3. Design Professionals are not obligated to inform the Contractor in advance what that Design Professional's standard hourly rates are or how much time will be spent or even whether or not that Design Professional intends to submit a bill; the Contractor shall be obligated to ask Design Professionals how much time a task may take and otherwise keep track of these items if the Contractor desires to consider hiring a different Design Professional to assist them in addressing deficiencies.
  4. These additional services are often short duration items scattered over a long period of time; the Design Professionals shall be permitted to send the Contractor a bill for all services associated with addressing deficiencies at the end of the project before a Certificate of Final Completion is issued. The Owner shall be permitted to pay for these services out of the Contractor's Retainage.

#### **1.10 SITA'S GENERAL DUTIES AND RESPONSIBILITIES**

- A. **Role:** The Special Inspection and Testing Agency (SITA) shall provide Construction Materials Engineering services, with a Construction Materials Engineer that directly supervises all SITA responsibilities and evaluates whether or not reports from inspections and/or tests conform with construction requirements in the drawings and specifications related to the specific inspections and/or tests required by Section 01 4533.
  - 1. It shall be the Contractor's sole responsibility to comply with all requirements of the Contract Documents, without relying on any of these quality control services. The purpose of the quality control services provided by the SITA is to simply provide some verification that the Contractor is complying with the Contract Documents.
  - 2. For clarification, acting under the supervision of the SITA's Construction Materials Engineer, the SITA's personnel shall be permitted to use judgment and experience when measuring dimensions and locations of elements where required by this specification section, to verify conformance with the design intent rather than measuring all instances. For example, where Section 01 4533 requires that the SITA verify locations and or dimensions of all elements for a certain type of construction, it shall be acceptable for the SITA personnel to field measure only a fraction of those dimensions (e.g. "random sampling") when non-measured conditions visually appear to conform, measuring at a frequency determined by the SITA to be appropriate using judgment and experience (rather than field measuring every dimension). Furthermore, the SITA may increase or decrease the frequency of these field measurements depending on how often deficiencies are encountered.
  - 3. The SITA shall not be permitted to release, revoke, alter, or enlarge on any requirements of Contract Documents; approve or accept any portion of the work; or, assume any duties of the Contractor. The SITA shall not have the authority to stop the work.
- B. **Contractor's Work Restrictions:** The Work Restrictions in Section 01 1400 related to Quality Control require that the Contractor obtain certain documents from the SITA and host certain meeting that the SITA attends, before certain construction milestones for the project to proceed. The SITA shall cooperate with the Contractor, providing those items and attending those meetings within a reasonable time frame.
- C. **Pre-Construction Meetings:** The SITA shall participate (in person or on the phone) at the Foundation Pre-Construction Meeting, Quality Control Pre-Construction Meeting, and Framing Pre-Construction Meeting.
- D. **SITA Reports:** After each special inspection or test, the SITA shall issue a report electronically to the Architect, Contractor, and the Design Professional requiring the report (e.g. concrete cylinder test reports for the foundation shall be submitted to the Structural Engineer), and anyone else the Architect indicates should be included in the distribution (e.g. AHJ, Owner, Construction Observer, etc...). These reports shall include the project title and number and information deemed appropriate by the Construction Materials Engineer.
- E. **Addressing Deficiencies:**
  - 1. The SITA shall notify the Architect, Contractor and the Design Professional requiring the quality control, of observed deficiencies or non-conformance of work or products.
    - a. A draft report of any deficiencies noted during inspections shall be provided to the Contractor on-site in writing (using the method(s) previously agreed to with the Contractor) before the special inspector leaves the site that day.
    - b. A final report of inspections shall be issued within five (5) business days of on-site visits. A report of tests performed shall be issued within five (5) business days of performing tests.
  - 2. Re-inspection and/or re-testing required because of Contractor's non-conformance to the Contract Documents shall be performed by the SITA and shall be paid for by the Contractor. In the event that this occurs, the SITA shall invoice the Contractor directly unless the Owner has indicated it is acceptable to simply bill the Owner and make note that the Owner should be reimbursed for the additional services.



- F. The SITA shall provide appropriate quality control staff on-site within five (5) business days of any request by the Contractor to perform inspections and tests required by Specification Section 01 4533, including any re-inspections, retests and/or repeat structural observations.
  - 1. The Contractor shall be responsible for requesting all site visits necessary for the SITA to perform all quality control services.
  - 2. If the Contractor does not request inspection, testing, and/or structural observation where required, the work that was not inspected, tested, and/or observed, shall be considered deficient.
- G. The SITA shall issue a report to the Architect, Structural Engineer and Contractor if inspection and/or testing indicates that work conforms or does not conform with the contract documents.
  - 1. If work that is required to be inspected or tested is covered or made permanently inaccessible by the Contractor prior to inspection or testing by the SITA, it shall be assumed that the covered work is non-conforming.
- H. The SITA shall comply with the requirements for issuing a Final Report of Special Inspections and Testing required by Section 01 4533.

#### **1.11 QUALITY CONTROL OBSERVATIONS**

- A. General
  - 1. The Contractor shall notify every quality control observer (e.g. the CxA and every Design Professional) at least five (5) business days before project conditions are ready for every site visit to make observations that those individuals would like to make.
  - 2. Quality control observers shall be permitted to issue a written observation report or simply note items verbally in a conversation with any representative of the Contractor onsite. The Architect and/or the Contractor may request written observation reports; however, each Design Professional shall be the sole determinant of if or when written observation reports are issued.
- B. Schedule of Site Visits
  - 1. Before the Quality Control Pre-Construction Meeting, the Contractor shall request from the CxA and every Design Professional a description of project conditions which are associated with every desired site visit. (For example, the Structural Engineer may indicate that after rebar is installed for the first grade beam pour but before concrete is poured, he or she would like to send an Engineer-In-Training or an Observer to the site to make observations.)
- C. Scope of Observations
  - 1. Site visits desired by Design Professionals but not specifically listed as required in Section 01 4533 are not code-required site visits (e.g. Structural Observations from regular visits by the Structural Engineer or his/her representatives are not the Code-Required Structural Observations listed in other portions of Section 01 4533).
  - 2. The observations are visual observations by the Design Professional, or their representative, of the systems which were designed by the Design Professional and are under construction or were recently constructed, for some verification that this work general conforms to the approved construction documents.
  - 3. The determination of which conditions to note during observation shall be made at the sole discretion of the Design Professional or their representative. These observations may be limited to clear indications noted in which the observer believes the Contractor misunderstood the design intent and the misunderstanding is about a significant requirement. The Design Professional shall not be responsible for identifying any and all significant deficiencies.

4. In written observation reports, the Design Professional shall be permitted to identify certain conditions as "registered" (e.g. registered deficiency, registered observation, registered item, etc...) at the Design Professional's discretion. The Contractor shall fully address all items noted, regardless of whether they are noted as registered or not; however, the Contractor shall provide the Design Professional with evidence that registered items have been fully addressed and ask the Design Professional if that evidence is sufficient, which provides a higher level of quality control.

## **PART 2 PRODUCTS - NOT USED**

## **PART 3 EXECUTION**

### **3.01 QUALITY CONTROL PRE-CONSTRUCTION MEETING**

- A. The Contractor shall schedule a "Quality Control Pre-Construction Meeting" with the SITA's Construction Materials Engineer, CxA, Structural Engineer (or a representative of), and the Architect's Construction Observer. Before scheduling the meeting, the Contractor shall ask the Owner if a representative of the Owner would like to attend. It shall be permitted for people to attend in person or by conference call. During this meeting:
  1. The Contractor shall review the approval status of the qualifications and scope statements from the SITA and CxA with all attendees.
  2. The Contractor shall acknowledge their responsibility to request site visits for all inspections and tests required by Specification Section 01 4533 before work is made inaccessible or covered. The Contractor shall also acknowledge their responsibility to address all deficiencies.
  3. The Contractor, SITA and CxA shall acknowledge their responsibilities to comply with the requirements for Final Reports of Quality Control from firms providing quality control service in Section 01 4533.
  4. The Contractor shall provide the construction schedule to all attendees. If this schedule changes during construction, the Contractor shall notify quality control personnel.
  5. The SITA and CxA shall summarize their understanding of how Specification Sections 01 1400 and 01 4533 shall be applied to this project.
  6. The Contractor shall summarize their understanding of when the Contractor is required to request SITA, CxA and Design Professional site visits for inspections and/or tests.
  7. The Architect's Construction Observer shall determine if the site visits described for Design Professionals hired by the Architect generally comply with the Owner-Architect Agreement.
  8. The Contractor shall acknowledge their obligation to notify Design Professionals how observations are addressed when observations are noted on reports as "registered".
  9. The Contractor and SITA shall determine collaboratively with each other a mutually agreed upon method for SITA technicians to provide the Contractor with written draft reports of any deficiencies before the technician leaves the site on the day the deficiencies are observed. This method shall not require Contractor's staff to be on-site to receive this draft report. As an example, this could include emailing a specified Contractor email address from smart phones or placing a hard copy of reports in a specified Contractor box outside the job trailer.
  10. The SITA and CxA shall each determine collaboratively with the Contractor when the last report from each firm (regarding any portion of the project) is likely to be issued.

### **3.02 QUALITY CONTROL SPECIFIED BY THE DESIGN PROFESSIONALS**

- A. Within 7 days after the Foundation Pre-Construction Meeting, the Contractor shall notify the SITA of any special inspections and testing required by delegated design professionals. The SITA shall perform all quality control required by each delegated design professional (hired by the Contractor) to be performed by the SITA. The delegated design professionals shall require quality control that they, in their professional opinion, believe appropriate for the SITA to perform given the nature of the work with consideration given to their understanding of the local industry standard of care. Proposers (potential Contractors) shall assume for proposal purposes that each delegated design professional will require the full scope of special inspections and testing (and structural observation if applicable) listed in the material specific sections and tables of Chapter 17 of the IBC unless told otherwise by the delegated design professional before Proposers submit proposals.
- B. Where special inspection and testing is specified by other design professionals (e.g. Architect, Structural Engineer, Civil Engineer, MEP Engineer, etc...) to be performed by the SITA for delegated design items, this work shall be performed at a minimum but shall not be a substitute for the quality control program required by the delegated design professional.

### **3.03 QUALITY CONTROL SPECIFIED BY THE STRUCTURAL ENGINEER**

- A. Scope: The quality control required by the Structural Engineer shall apply to all work sealed by the Structural Engineer of Record, the individual who sealed the "S" Sheets.
- B. Special Inspections for Soils
  - 1. Reference SITA Scope on the Drawing Sheets: The SITA shall perform special inspection and testing of the soil below the carton void forms and the subgrade in the crawlspace as required by the Civil Engineer on the Civil Drawing sheets for general site grading and fill, with utility trench backfill as required by the Mechanical and Electrical Engineers on the MEP Drawing sheets as well as the Technology Consultant on the Technology Drawing sheets.
  - 2. Coordination with the Geotechnical Engineer: The SITA shall coordinate inspections and testing of soil with observations by the Geotechnical Engineer, regardless of whether the Geotechnical Engineering Firm is the same firm or a different firm from the SITA firm. The Contractor shall contact the Geotechnical Engineer before the Quality Control Pre-Construction Meeting to determine when the Geotechnical Engineer recommends observations and communicate the schedule on these Geotechnical observations to the SITA. The Contractor shall then notify the Geotechnical Engineer at the appropriate times so that the Geotechnical Engineer can make observations onsite. Where the Geotechnical Engineer recommends that the Geotechnical Engineer be onsite to confirm items (e.g. appropriate depth of a strata, appropriate condition of a strata, anticipated subsurface water conditions, etc...), the SITA shall not perform inspections and testing associated with those items until the Geotechnical Engineer has made such observations.
- C. Deep Foundation Elements and Footings

1. The SITA shall observe the installation of all deep foundation elements and/or footings and record all information necessary for the SITA to provide a reliable cost reconciliation by linear foot for each type of deep foundation element and cubic yard of excavation and reinforced concrete for footings. This information shall include the elevation of the grade at the time of drilling, which the SITA may obtain from the Contractor. This information shall also include the elevation of the the bottom of steel casing (or depth below grade at a known elevation), when casing is used. The SITA shall be the sole determinant in the field, for each deep foundation element and for all footings, when sufficient bearing material has been reached and the SITA shall identify for the Contractor, during drilling/excavation, the highest elevations that the SITA considers acceptable so as to assist the Contractor in minimizing work (especially work associated with a unit price adjustment). The SITA shall be the sole determinant in the field, for each deep foundation element, when casing is required and the SITA shall identify for the Contractor, during drilling, the fewest piers the SITA considers necessary to case and the highest elevations that the SITA considers acceptable for the bottom of casing at each pier so as to assist the Contractor in minimizing work (especially work associated with a unit price adjustment).
  2. After the Contractor indicates that the last Deep Foundation Element has been installed, the Contractor shall request a Deep Foundation Element Reconciliation Report from the SITA. The SITA shall then provide a tabulation of the difference between assumed and actual conditions for the total cumulative length of uncased deep foundation elements, and cased piers where applicable, for each diameter and reinforcement pattern. The Contractor shall then calculate the change in cost associated with the Pier Reconciliation Report from the SITA and then submit a Request for Information, asking the Architect and any appropriate Design Professionals to review the report and proposed cost change before a Proposed Cost Revision is submitted.
- D. Special Inspections and Testing for Concrete Construction
1. Before requesting that SITA personnel visit the site to make inspections of concrete work, the Contractor shall electronically send to the SITA any applicable reinforcement shop drawings and concrete mix design submittals that have been reviewed by the specifying Engineering Firm. The Contractor shall give the SITA sufficient time and lighting at the site, as deemed necessary by the SITA, to perform the specified inspections and testing.
  2. The SITA shall provide the following inspections and testing for concrete construction.
    - a. Before every concrete pour (generally the same day of the pour unless the SITA deems the scope of the pour to be too large), the SITA shall visit the site and inspect the reinforcement for conformance with the reviewed shop drawings, to the extent that the SITA deems appropriate under the supervision of the Construction Materials Engineer (e.g. yield strength, size, spacing, concrete cover, etc...at a random sampling to be determined by the SITA). While onsite, the SITA shall be empowered but shall not be obligated to make comments and/or ask questions during inspections regarding related conditions, including but not limited to anchor bolt embedment, steel embed plate type and location, formwork, concrete accessories, debris, etc....
    - b. During concrete pours, for each intended use (e.g. footing, grade beam, interior slab on grade, etc...), the SITA shall sample concrete from the first concrete truck on each day of concrete pouring and shall determine which other concrete trucks they will sample each day, if any. The SITA shall, however, sample trucks so that no more than 150 cubic yards of concrete is placed at a time without being sampled (e.g. sampling every 150 cubic yards). While onsite, the SITA shall be empowered but shall not be obligated to make comments during inspections regarding related conditions, including but not limited to unsafe conditions, age of concrete in trucks after batching before poured, vibration of concrete, hot weather and cold weather concrete placement methods, temperature and wind speed for the pour that day, and curing conditions for previously poured areas.

- c. For each truck that is sampled, the SITA shall do the following and notify the Contractor immediately of any deficiencies so that the Contractor has an opportunity to address those deficiencies:
    - 1) Collect a copy of the batch ticket and verify that the mix design matches the reviewed submittal for the intended use;
    - 2) Collect a sample in accordance with ASTM C172.
    - 3) Perform a slump test in accordance with ASTM C172 and verify that the slump is within the range on the submittal;
    - 4) Perform an air content test in accordance with ASTM C231 or ASTM C173 and verify the air content is within the range on the submittal;
    - 5) Record the concrete temperature;
    - 6) Fabricate cylinders molded and standard-cured in accordance with ASTM C31. Each set of cylinders shall consist of either four cylinders that are 6" in diameter and 12" tall or five cylinders that are 4" in diameter and 8" tall. The Contractor shall be responsible for providing a portion of the site to the SITA for cylinder storage; however, the proper temperature and humidity of curing of all test cylinders and protection of curing on the jobsite shall be the responsibility of the SITA and not the Contractor. The SITA shall also be responsible for transportation from the field to the laboratory. All test cylinders shall be stored in the field 24 hours and then be carefully transported to the laboratory and cured in accordance with ASTM C31.
    - 7) The Contractor shall have the option to pay the SITA to perform additional inspections and testing, such as additional concrete cylinders whenever desired to determine early strengths. The Contractor shall be responsible for any additional cylinders required to comply with OSHA requirements.
  - d. For each set of concrete cylinders fabricated, the SITA shall perform compression strength testing in accordance with ASTM C 39 with one (1) cylinder at 7 days and either two (2) 6" diameter cylinders or three (3) 4" diameter cylinders at 28 days. The SITA shall hold one cylinder in reserve and test the reserve cylinder at 56 days only if the average of the 28 day cylinder strengths is below the specified strength and the specifying Engineer indicates it is acceptable to test at 56 days rather than waiting a longer period of time.
- E. Special Inspections and Testing for Masonry Construction
- 1. Before requesting that SITA personnel visit the site to make inspections of masonry work, the Contractor shall electronically send to the SITA any applicable reinforcement shop drawings and mortar/grout mix design submittals that have been reviewed by the Structural Engineering Firm. The Contractor shall notify the SITA of the rate of masonry construction as it occurs so that the SITA is onsite the first day of structural masonry work and no more than 5,000 square foot of structural masonry is constructed at a time without the SITA being onsite for inspections and testing (e.g. notifying the SITA every 5,000 square feet). The Contractor shall also coordinate the SITA site visits such that structural masonry work is occurring (e.g. masons are installing masonry) when the SITA is performing inspections and tests. Structural masonry for the purposes of quality control is hereby defined as all reinforced concrete masonry walls which are exterior walls and load-bearing walls.
  - 2. The SITA shall provide the following inspections and testing for masonry construction:
    - a. The first day of masonry work, the SITA shall observe the mason mixing the first batches of both mortar and grout, verifying the following (with the mason preparing a batch of mortar or grout for inspection purposes only, to be discarded, if no mortar or grout is needed that day):
      - 1) the ingredients appear to be consistent with the reviewed mix submittals (e.g. the type of cementitious materials listed on bags appear correct);
      - 2) the volumetric proportions are consistent with the reviewed mix submittals; and,

- 3) containers with known volume are used when batching (allowing the mason to assume that a bag of cement weighing at least 92 pounds is a cubic foot), verifying that shovels are not used when proportioning sand or gravel.
  - b. At every visit for inspections and testing of masonry construction, the SITA shall do the following:
    - 1) Inspect bedjoint reinforcement and vertical as well as horizontal conventional reinforcement where work is exposed (i.e. constructed but not obstructed from view with grout or masonry) for conformance with the reviewed shop drawings, to the extent that the SITA deems appropriate under the supervision of the Construction Materials Engineer (e.g. yield strength, size, spacing, masonry cover, etc...) at a random sampling to be determined by the SITA);
    - 2) Inspect grout spaces to verify they are clear of debris;
    - 3) Sample grout and fabricate a set of three (3) grout prisms (grout only, formed with CMU on all sides, and not a masonry prism which is constructed with two units and a mortar joint) and test in the lab at 28 days in accordance with ASTM C 1019. The Contractor shall be responsible for providing a portion of the site to the SITA for prism storage; however, the proper temperature and humidity of curing of all test prisms and protection of curing on the jobsite shall be the responsibility of the SITA and not the Contractor. The SITA shall also be responsible for transportation from the field to the laboratory.
      - (a) every time grout is sampled to make prisms, the SITA shall perform a slump test and verify that the slump is greater than 8".
    - 4) While onsite, the SITA shall be empowered but shall not be obligated to make comments and/or ask questions during inspections regarding related conditions, including but not limited to use of integral water repellent in mortar mixes where specified, mortar mixing, grout mixing, grouting where post-installed anchors will be required, anchor bolt embedment of embedded anchor bolts, steel embed plate type and location, masonry accessories, veneer anchors, debris, lift height for grouting, age or segregation of mortar or grout when placed, vibration, hot weather and cold weather practices, material certification for masonry units, proper face-shell bedding, bracing of previously constructed non-loadbearing masonry walls, and curing conditions for previously constructed walls.
    - 5) Mortar cubes and masonry prisms are not required. If the SITA produces mortar cubes or masonry prisms without the Owner's authorization, the Owner will not pay for mortar cube preparation or mortar cube testing. The Contractor shall be permitted to request and pay for mortar cubes or masonry prisms, if the Contractor desires.
- F. Special Inspections and Testing for Steel Construction
1. Before requesting that SITA personnel visit the site to make inspections of structural steel work, the Contractor shall electronically send to the SITA copies of the welding certifications for every steel welder that will be onsite, manufacturer certification for every adhesive anchor installer that will be onsite and any applicable structural steel submittals that have been reviewed by the Structural Engineering Firm. Upon receipt of the welding certifications, the SITA Staff shall verify these welders have passed qualification tests within the last year using procedures covered in the American Welding Society "Structural Welding Code - Steel," D1.1, latest version. Upon receipt of the adhesive anchor certifications, the SITA Staff shall verify these installers do not have an expired certification. The inspector (acting under the supervision of the Construction Materials Engineer) shall be permitted to accept alternative experience and/or on site demonstration of competency if qualified in the opinion of the inspector.

2. Inspection and Testing at Non-AISC Fabrication Shops: If any steel fabrication occurs off-site at a fabrication shop that is not an AISC certified fabrication shop (excluding Steel Joist Institute facilities manufacturing steel joists), the Steel Fabricator shall pay for the SITA to perform the special inspections or testing required by Section 01 4533 for all such off-site steel fabrication. The Contractor shall notify the SITA when fabrication of steel is scheduled to begin at these facilities. The SITA shall visit these facilities at the beginning of steel work within those facilities and review the quality assurance / quality control documentation at that facility (e.g. processes, welder certifications, logs of welding inspections, etc...). The SITA Staff, acting under the supervision of the Construction Materials Engineer, shall then determine how much (if any) of the specified inspection and testing for on-site steel construction shall apply to the non-AISC-certified shop construction, and then perform that scope of work after communicating to the Contractor when the SITA is to be notified for inspections at the shop. For proposal purposes, Steel Fabricators with non-AISC shops shall assume that the SITA Staff will require the full scope of inspection and testing for on-site steel construction shall apply to the non-AISC-certified shop construction.
3. On-Site Inspection and Testing: The Contractor shall notify the SITA of the status of steel construction as it occurs so that the SITA is onsite after defined areas of the structural steel portion of the project are complete (with the exception that the SITA must be present during the installation of any overhead adhesive anchors), notifying the SITA of any work within those areas that is to be completed at a later date. The Contractor shall not cover up portions of steel construction until the SITA has performed quality control services without identifying any deficiencies at those areas. By the end of the project, the Contractor shall have scheduled visits from the SITA for steel inspection and testing of all structural steel construction (including all miscellaneous steel members but not including cold formed metal framing) that occurred on-site. During each sitevisit, the SITA shall do the following:
  - a. Verify off-site fabrication occurred at an AISC certified fabrication shop (by obtaining a copy of the shop's certificate), unless the SITA has provided the specified inspection and testing services at the fabrication shop.
  - b. Structural Steel Members: Verify that the structural steel framing member sizes and locations generally conform to the reviewed steel submittals.
  - c. Welds that are not Full Penetration welds: Out of all the welds in the area defined by the Contractor as being ready for inspection, the SITA Staff shall determine how many and which welds to visually inspect (acting under the supervision of the Construction Materials Engineer). At a minimum, the SITA shall inspect at least 10% of each type of weld. The SITA shall be permitted to inspect up to 100% of each type of weld if the SITA Staff believe appropriate, based on the conditions observed. The Contractor shall clean all welds identified for visual inspection by the SITA. Visual inspection of welds shall include but not be limited to alignment of members, weld size, length, location, weld/base-metal fusion and signs of cracking.
  - d. Welds that are Full Penetration welds:
    - 1) the Contractor shall clean all full-penetration welds. The SITA Staff shall visually inspect all full-penetration welds.
    - 2) out of all the full-penetration welds in the area defined by the Contractor as being ready for inspection, the SITA Staff shall determine how many and which welds receive Ultrasonic Testing (acting under the supervision of the Construction Materials Engineer). At a minimum, the SITA shall perform Ultrasonic Testing on at least 10% of each type of full-penetration weld (e.g. normal full-penetration, flare vee, etc...). The SITA shall be permitted to perform Ultrasonic Testing on up to 100% of each type of full-penetration weld if the SITA Staff believe appropriate, based on the conditions observed.
  - e. Bolts:

- 1) **Load-Indicator Type Bolts:** Out of all the load-indicator bolts in the area defined by the Contractor as being ready for inspection, the SITA Staff shall determine how many and which load-indicator bolts receive inspection and testing (acting under the supervision of the Construction Materials Engineer). At a minimum, the SITA shall visually inspect at least 10% of each type of load-indicator bolt. The SITA shall be permitted to visually inspect up to 100% of the load-indicator bolts if the SITA Staff believe appropriate, based on the conditions observed. Visual inspection and testing of load-indicator bolts shall include verification that the grade, diameter, location, and minimum length generally conform with the reviewed steel submittals, and that the splines have been snapped off to indicate proper torquing. If any steel to steel connections do not utilize load-indicator type bolts, this section shall apply.
- 2) **Anchor Bolts that are not Overhead Adhesive Anchor Bolts:** Out of all the anchor bolts (including base plate anchor bolts, expansion bolts, and adhesive anchor bolts but excluding overhead adhesive anchor bolts) in the area defined by the Contractor as being ready for inspection, the SITA Staff shall determine how many and which anchor bolts receive inspection and testing (acting under the supervision of the Construction Materials Engineer). At a minimum, the SITA shall visually inspect at least 10% of each type of anchor bolts. The SITA shall be permitted to visually inspect up to 100% of the anchor bolts if the SITA Staff believe appropriate, based on the conditions observed. Visual inspection and testing of anchor bolts shall include verification that the bolts are snug tight in the opinion of the SITA, wedge anchors are fully torqued and no longer able to rotate, and verification that the grade, diameter, location, and minimum length beyond the nut generally conform with the reviewed steel submittals.
- 3) **Overhead Adhesive Anchors:** The SITA Staff shall be present during the installation of all adhesive anchors oriented vertically such that the anchors are in tension, if there are any such anchors on the project. During the installation, the SITA shall visually inspect the bolts as with all other anchor bolts and inspect the installation, commenting if the installation does not appear to be consistent with the manufacturer's recommended installation procedures.
- f. **Metal Deck:** For all metal deck, verify the type, gauge, finish, weld pattern and sidelap connections conform with the reviewed deck submittals.
- g. While onsite, the SITA shall be empowered but shall not be obligated to make comments and/or ask questions during inspections regarding related conditions, including but not limited to unsafe conditions, counterfeit steel members and/or bolts, galvanized steel being cut/scratched/welded (which is not permitted), exterior exposure of non-galvanized material that is not to be painted, welding procedures, steel angle supports around openings in metal deck, deck closures, fire protection, removal of backer plates, grinding of exposed welds, temporary or permanent bracing, and visual acuity of welders.

### **3.04 QUALITY CONTROL SPECIFIED BY THE CIVIL ENGINEER**

- A. Reference Civil drawings for quality control required by the Civil Engineer.

### **3.05 QUALITY CONTROL SPECIFIED BY THE ARCHITECT**

- A. Special Inspections for Sprayed Fire Resistant Materials
  1. Sprayed Fire Resistant Materials, General:
    - a. Verify compliance of sprayed-fire resistant materials with specific fire-rated assemblies shown in the approved contract documents.
    - b. Perform special inspections after rough installation of electrical, mechanical, plumbing, automatic fire sprinkler and suspension systems for ceilings.
  2. Physical and visual tests: Verify compliance with fire resistance rating.
    - a. Condition of substrates; periodic
    - b. Thickness of sprayed fire resistant material; periodic.



- c. Density of sprayed fire resistant material in pounds per cubic foot; per model building code.
- d. Bond strength (adhesion and cohesion); per model building code.
- e. Condition of finished application; per model building code.
- 3. Structural member surface conditions:
  - a. Inspect structural member surfaces before application of sprayed fire resistant materials; periodic.
  - b. Verify preparation of structural member surfaces complies with approved contract documents and manufacturer's written instructions; periodic.
- 4. Application:
  - a. Ensure minimum ambient temperature before and after application complies with the manufacturer's written instructions; periodic.
  - b. Verify area where sprayed fire resistant material is applied is ventilated as required by the manufacturer's written instructions during and after application; periodic.
- 5. Thickness: Verify that no more than 10 percent of thickness measurements taken from sprayed fire resistant material are less than thickness required by fire resistance design in approved contract documents. In no case shall the thickness of the sprayed fire resistant material be less than the minimum below.
  - a. Minimum Allowable Thickness: Tested according to ASTM E605, random.
    - 1) Design thickness 1 inch or less: Design thickness minus 1/4 inch.
    - 2) Design thickness greater than 1 inch: Design thickness minus 25 percent.
  - b. Floor, Roof and Wall Assemblies: Test thickness according to ASTM E605 with no less than four measurements per 1,000 square feet of sprayed area on each story of the structure or portion thereof; random.
    - 1) Cellular Decks: Measure thickness within a single 12 inch by 12 inch area. Make a minimum of four measurements arranged symmetrically in testing area.
    - 2) Fluted Decks: Measure thickness within a single 12 inch by 12 inch area. Make a minimum of four measurements arranged symmetrically in testing area and include one example each of valley, crest and sides. Report the average of the four measurements.
  - c. Structural Members: Test according to ASTM E605. Test no less than 25 percent of structural members on each story of the structure or portion thereof; random.
    - 1) Beams and girders: Make nine thickness measurements around beam or girder at each end of a 12 inch by 12 inch length.
    - 2) Joists and trusses: Make seven thickness measurements around joist or truss at each end of a 12 inch by 12 inch length.
    - 3) Wide flanged columns: Make twelve thickness measurements around column at each end of a 12 inch by 12 inch length.
    - 4) Hollow structural sections and pipe columns: Make four thickness measurements around hollow structural section or pipe column at each end of a 12 inch by 12 inch length.
- 6. Density: Verify density of sprayed fire resistant material is no less than density required by the fire resistance design in the approved contract documents.
  - a. Floor, Roof and Wall Assemblies: Test according to ASTM E605 with no less than one sample per 2,500 square feet of sprayed area on each story of the structure or portion thereof; random.
  - b. Beams, Girders, Trusses and Columns: Test according to ASTM E605 with no less than one sample per 2,500 square feet of sprayed area on each story of the structure or portion thereof; random.
- 7. Bond Strength: Verify adhesive and cohesive bond strength of sprayed fire resistant materials is no less than 150 pounds per square foot when in-place samples of the cured material are tested according to ASTM E736 and as described below.
  - a. Floor, roof and wall assemblies: Test no less than one sample per each 2,500 square feet of sprayed area on each story of the structure or portion thereof; random.

- b. Structural members: Test no less than one sample from each type of structural member in each 2,500 square feet of each story of the structure or portion thereof; random.
  - c. Primer, paint and encapsulant bond tests: When sprayed fire resistant material is applied to a primed, painted or encapsulated surface for which acceptable material to substrate performance has not been determined, conduct bond test.
- B. Special Inspections for Mastic and Intumescent Fire Resistant Coatings
  - 1. Verify mastic and intumescent fire resistant coatings comply with AWCI 12-B and the fire resistance rating shown on the approved contract documents.
- C. Special Inspections for Firestopping Penetrations and Joints
  - 1. Before the installation of any firestopping at penetrations and joints, the SITA shall verify that the installer of firestopping at penetrations and joints is an FM4991 "Approved Standard for Firestop Contractors" approved firestop contractor or UL Qualified Firestop Contractor.
  - 2. The SITA shall inspect firestopping at penetrations in accordance with ASTM E 2174 "Standard Practice for On-Site Inspection of Installed Fire Stops" for each type of firestop being used. A unique "type" shall be defined by the UL Fire Resistance Directory utilizing UL's alpha-alpha-numeric numbering system based on a specific combination of penetrant, substrate and firestop product. For each type of penetration, inspections shall be by either witnessing the entire installation of 10% of the penetrations. Alternatively, for each type of penetration that is not a pre-formed firestopping penetration device, inspections shall be permitted to be by the SITA removing a portion of the firestopping at 2% of the penetrations, verifying the proper depth of installation (and compression at mineral wool, if applicable) and the firestopping installer replacing the firestopping in the presence of the SITA. For preformed-devices, the inspection shall be either by witnessing 10% of the installation of each type of firestop, or alternatively by a post-installation verification that the installed system complies with the reference listed system or engineering judgment. If non-compliant conditions are encountered by the SITA, the SITA shall proceed as directed by ASTM E 2174.
  - 3. The SITA shall inspect firestopping at joints in accordance with ASTM E 2393 "Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers" for each type of firestop being used. A unique "type" shall be defined by the UL Fire Resistance Directory utilizing UL's alpha-alpha-numeric numbering system based on a specific combination of joint type (head of wall, wall to wall, floor to wall, floor to floor, floor to exterior wall) firestopping material or system (for example, intumescent, caulk, mortar, sealant, mechanical, factory preassembled), and substrates (for example, gypsum wall, concrete floor, composite floor deck). For each type of joint, inspections shall be by either witnessing 5% of the total lineal feet to be installed on the project. Alternatively, inspections shall be permitted to be by the SITA removing at least 1 foot every 500 linear feet of the firestopping on the project, verifying the proper depth (and compression at mineral wool, if applicable) of installation and the firestopping installer replacing the firestopping in the presence of the SITA, or in the case of a pre-formed firestopping joint device, by verifying that the device has been installed in accordance with the reference listed system or engineering judgment. If non-compliant conditions are encountered by the SITA, the SITA shall proceed as directed by ASTM E 2393.
  - 4. If at any time, material removed by the SITA from penetrations and/or joints for a type does not conform to the project requirements, the SITA shall double the amount of destructive testing for that type unless the penetrations and joints were installed by SITA witnessing installation. Further non-compliance shall be addressed as directed by ASTM E 2174 and/or ASTM E 2393. If at any time, installation of firestopping at penetrations and/or joints does not conform with the contract documents while being witnessed by the SITA inspector, the SITA inspector is to proceed as directed by ASTM E 2174 and/or ASTM E 2393. Non-compliance according to these ASTM's may lead to work stoppage that requires approval by the AHJ to resolve the non-compliance.

### **3.06 QUALITY CONTROL SPECIFIED BY THE MECHANICAL AND ELECTRICAL ENGINEERS**

- A. The CxA shall visit the site to make observations as specified by Section 01 9100, Section 01 4533 and Divisions 22-26.

### **3.07 FINAL QUALITY ASSURANCE REPORTS**

A. General

1. Before applying for a Certificate of Occupancy, the Contractor shall obtain a Final Report from each of the following quality control firms and submit them all at one time to the AHJ:
  - a. SITA, Final Report of Special Inspections and Testing
  - b. CxA, Final Report of Commissioning
  - c. Structural Engineer, Final Report of Structural Engineering Observations
  - d. Mechanical Engineer, Final Report of Mechanical Engineering Observations
  - e. Electrical Engineer, Final Report of Electrical Engineering Observations
2. Quality assurance personnel shall not be required by the AHJ to issue any certifications, guarantees, or warranties because that is not in their scope of work. Specific language or formatting of the final report shall not be considered a requirement by the AHJ for this project unless the AHJ indicates otherwise before a building permit is issued. (If specific language is desired, quality assurance personnel would need to understand that specific language before performing their scope of work to ensure that they can accurately write a letter with that language.)
3. The Final Report from every firm providing quality control services shall be sealed by a Professional Engineer licensed in the State of Texas and shall indicate, if it is true, that the author of the Final Report:
  - a. Represents the firm, identifying which quality control services were provided by that firm,
    - 1) Has reviewed all previous reports and believes all of the quality control services required by Section 01 4533 to be performed by their firm have been performed,
    - 2) Has reviewed all previous reports and believes there are no unresolved deficiencies, and,
    - 3) To the best of his or her knowledge, regarding the portion of the project associated with their scope of work, they believe the construction conforms.
      - (a) The SITA shall indicate they believe the results of inspections and testing were within project specifications.
      - (b) Quality control observers shall indicate they believe the construction generally conforms with the contract documents.
4. An example of acceptable language in a Final Report is as follows:
  - a. For the SITA: "I am the Construction Materials Engineer representing [insert SITA firm's name], which was responsible for providing Special Inspections and Testing Agency (SITA) services for the [insert project name] located at [insert project address], Huckabee project number [insert project number]. I have reviewed all previous reports from our firm and believe all of the quality control services required by Section 01 4533 of the Project Manual to be performed by the SITA have been performed. I have also reviewed all previous reports from our firm and believe there are no unresolved deficiencies. To the best of my knowledge, regarding the portion of the project associated with our firm's scope of work, I believe the results of inspections and testing were within project specifications."

- b. For the CxA: "I am the individual representing [insert CxA firm's name], which was responsible for providing Commissioning (CxA) services for the [insert project name] located at [insert project address], Huckabee project number [insert project number]. I have reviewed all previous reports from our firm and believe all of the quality control services required by Section 01 4533 of the Project Manual to be performed by the CxA have been performed. I have also reviewed all previous reports from our firm and believe there are no unresolved deficiencies. To the best of my knowledge, regarding the portion of the project associated with our firm's scope of work, I believe the construction generally conforms with the contract documents."
  - c. For the Structural Engineer, Mechanical Engineer and Electrical Engineer: "I am the [insert project role] representing [insert firm's name], which was responsible for providing observations for the [insert project name] located at [insert project address], Huckabee project number [insert project number]. I and/or a representative of my firm visited the site at certain stages of construction and made observations. The Contractor is obligated to address all of my observations and has indicated to me that this was done. Therefore, to the best of my knowledge, I believe the construction related to my role generally conforms with the contract documents."
- B. Request for Final Report
- 1. Within 48 hours of receiving the last inspection, test or observation report expected for the project (regarding any portion of the project) from each firm providing quality control services, the Contractor shall issue an RFI requesting a Final Report of Quality Control from that firm. For clarification, the Contractor shall not be permitted to wait until the end of the project or even until all quality control firms have completed their work. The Contractor shall be responsible for addressing any unresolved deficiencies and submit a written statement to all quality assurance observers in the RFI that their observations were fully addressed before requesting this report from each firm. For proposal purposes, the Contractor shall assume that within ten (10) business days each firm providing quality control services will either issue this report without any unresolved deficiencies or identify in writing any known but unresolved deficiencies. If any unresolved deficiencies are identified during this process, the Contractor shall address these deficiencies and then request a final report again.
  - 2. When the Contractor requests a Final Report of Quality Control from each quality control firm, quality control personnel shall verify that the scope of quality control services required by Specification Section 01 4533 was performed and that any deficiencies identified have been addressed.
    - a. If it appears there are no unresolved deficiencies, the firm shall create and distribute a Final Report within ten (10) business days of receiving the request from the Contractor for the final report. The final report shall be sealed by a professional engineer licensed in the state of Texas and shall be distributed to the Contractor and the Architect.
    - b. If the firm determines that there are unresolved deficiencies, the firm shall notify the Contractor within ten (10) business days of receiving the request from the Contractor for the Final Report that a Final Report cannot be provided until all unresolved deficiencies are resolved. It is preferred but not required that the firm also provide the Contractor a complete list of all deficiencies identified by the firm to date.

**END OF SECTION**

**SECTION 01 5000**  
**TEMPORARY FACILITIES AND CONTROLS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Temporary utilities.
- B. Temporary sanitary facilities.
- C. Temporary Controls: Barriers, enclosures, and fencing.
- D. Security requirements.
- E. Vehicular access and parking.
- F. Waste removal facilities and services.
- G. Project identification sign.
- H. Field offices.

**1.02 TEMPORARY UTILITIES**

- A. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes including review and inspection of work.
- B. New permanent facilities may not be used.

**1.03 TEMPORARY SANITARY FACILITIES**

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- B. Use of existing facilities is not permitted.
- C. New permanent facilities may not be used during construction operations.
- D. Maintain daily in clean and sanitary condition.
- E. At end of construction, return facilities to same or better condition as originally found.

**1.04 BARRIERS**

- A. Provide barriers to prevent unauthorized entry to construction areas., to allow for owner's use of siteProtect existing facilities and adjacent properties from damage from construction operations and demolition. Implement safety precautions that comply with all regulatory requirements.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- C. Provide protection for plants designated to remain. Replace damaged plants.
- D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

**1.05 FENCING**

- A. Construction: Commercial grade chain link fence.
- B. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.
- C. On sites where students are present, no work shall commence prior to fence being in place.

**1.06 EXTERIOR ENCLOSURES**

- A. Provide temporary weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

**1.07 SECURITY**

- A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

- B. Coordinate with Owner's security program.

#### **1.08 VEHICULAR ACCESS AND PARKING**

- A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.
- B. Coordinate access and haul routes with governing authorities and Owner.
- C. Provide and maintain access to fire hydrants, free of obstructions.
- D. Provide means of removing mud from vehicle wheels before entering streets.
- E. Designated existing on-site roads may be used for construction traffic.
- F. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.
- G. Do not allow vehicle parking on existing pavement.

#### **1.09 WASTE REMOVAL**

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. If materials to be recycled or re-used on the project must be stored on-site, provide suitable and secure non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
- C. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

#### **1.10 PROJECT IDENTIFICATION**

- A. No later than ten (10) days after the Notice to Proceed, and prior to start of construction, provide a job sign at the job site.
- B. Request sign layout and details from the Architect.
- C. Contractor shall be responsible to pick up sign.
- D. Provide project identification sign of design and construction indicated on drawings.
- E. Erect on site at location indicated.
- F. No other signs are allowed without Architect's permission except those required by law.

#### **1.11 FIELD OFFICES**

- A. Office: Weathertight, with lighting, electrical outlets, heating, cooling and ventilating equipment, and equipped with sturdy furniture, drawing rack .
- B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.
- C. Provide separate work station similarly equipped and furnished, for use of Architect..
- D. Locate offices a minimum distance of 50 feet from existing and new structures.

#### **1.12 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS**

- A. Remove temporary utilities, equipment, facilities, materials, prior to final punch list and review inspection.
- B. Remove underground installations to a minimum depth of 3 feet. Grade site as indicated.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore existing facilities used during construction to original condition.
- E. Restore new permanent facilities used during construction to specified condition.

#### **PART 2 PRODUCTS - NOT USED**

#### **PART 3 EXECUTION - NOT USED**

**END OF SECTION**

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**SECTION 01 5639**  
**TEMPORARY TREE AND PLANT PROTECTION**

**PART 1 - GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. Tree preservation work includes, but is not limited to:
  - 1. Protection of existing trees and all other indicated to remain in place.
  - 2. Maintenance of protected areas.
  - 3. Clearing and grubbing activity within protected areas.
  - 4. Damage compensation.

**1.03 APPLICABLE REGULATIONS**

- A. Comply with all applicable local laws and regulations concerning tree preservation as well as the specific requirements stated elsewhere in the Specifications.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION**

**3.01 PROTECTION OF EXISTING TREES TO REMAIN**

- A. Tagging and Fencing
  - 1. Trees to remain shall be tagged and protective fencing installed prior to any construction, demolition, or other disturbance.
  - 2. Protective fencing shall be installed at the dripline of the tree to be protected unless otherwise noted on the Plans.
  - 3. The area inside the protective fencing will heretofore be referred to as the protected area.
  - 4. The Contractor shall verify tagged trees and fence locations in field with the Landscape Architect prior to any construction or demolition activity.

**3.02 MAINTENANCE OF PROTECTED AREA**

- A. No construction activity shall occur inside protected areas other than that landscape construction which is required for completion of the project.
  - 1. Construction activity includes, but is not limited to, building material storage, waste stockpiling, topsoil stockpiling, equipment storage or parking, disposal of waste materials of any kind, draining or flushing of tanks, canisters, drums, or other containers, trailer parking or storage, and demolition activity.
- B. No traffic, vehicular or pedestrian, shall encroach upon protected areas.
  - 1. This includes, but is not limited to, personal passenger vehicles, construction vehicles, grading machinery, and loading/lifting machinery.
- C. No material, machine, vehicle, or part thereof shall encroach above or below the vertical plane of the protective fencing into the protected area.
- D. The Contractor shall notify the Landscape Architect of any activity which might infringe or encroach upon the protected area prior to start of said activity.

**3.03 ENCROACHMENT UPON PROTECTED AREA**

- A. If encroachment into the protected area does occur, notify the Landscape Architect immediately.

### **3.04 ACTIVITY INSIDE PROTECTED AREAS END OF SECTION**

- A. Clearing and Grubbing:
  - 1. Clearing of small trees, shrubs, and herbaceous plants in the protected area shall be performed by hand only.
  - 2. Bulldozers and/or drag chain operations are not permissible inside protected areas.
  - 3. Grubbing of stumps shall be performed in two (2) ways:
    - a. Under 6" diameter shall be pulled by chain.
      - 1) The vehicle used for pulling shall remain outside the protected area (dripline of the tree to remain) whenever possible.
      - 2) Under no circumstance shall the pulling vehicle encroach into the protected area by more than 1/3 of the distance from the trunk of tree to remain to the nearest edge of the protected area (dripline).
      - 3) Any depressions shall be filled with topsoil and leveled to grade by hand.
    - b. Stumps over 6" diameter shall be ground out to a depth of 4" below grade.
      - 1) Stump grinder shall be trailer mounted and maneuvered by light truck or bobcat.
      - 2) Wood chips generated by grinding shall be removed and any depressions shall be filled with topsoil and leveled to grade.
      - 3) These operations shall be performed by hand.
- B. Grading:
  - 1. Any grading which may be required inside the protected area shall be performed by hand only.
  - 2. No grading or earthmoving machinery shall be allowed inside the protected area.
  - 3. Provide grade stakes and verify grade elevations with the Landscape Architect prior to commencement of any grading activity.
- C. Preparation of soil for seeding and/or sodding within the protected areas shall be done by hand or with a power rake and shall not disturb soil more than 2" deep to prevent damage to feeder root systems.
  - 1. Chemical herbicides shall be used within protected areas unless the Contractor can obtain written manufacturer's guarantee that herbicide will not harm tree health or growth and obtain written approval from the Landscape Architect.
  - 2. Contact the Landscape Architect prior to seed or sod preparation within protected areas to determine exact seed and/or sod limits.
- D. Stake locations of all utilities which encroach protected areas.
  - 1. Contact the Landscape Architect prior to clearing or trenching for utilities to verify that staked location is the least obtrusive to protected area.

### **3.05 REMOVAL OF PROTECTIVE FENCING**

- A. Protective fencing may be removed to facilitate landscape work in the protected area.
  - 1. All Work in the protected area shall be initiated within 24 hours of fence removal.
  - 2. If landscape work in the protected area is delayed or interrupted for more than 24 hours, then protective fencing shall be reinstalled until such time as work in the protected area is resumed.
  - 3. Protective fencing shall be reinstalled after substantial completion of work inside protected area and shall remain until substantial completion of the project or approval of the Landscape Architect, whichever is later.

### **3.06 DAMAGE COMPENSATION**

- A. Any damage occurring to trees to remain or protected areas or removal of trees to remain in the protected areas caused by neglect, unauthorized encroachment and/or inadequate protection enforcement as



1. Financial Compensation for said damage or removal shall be determined by the Landscape Architect and Owner as per the following guidelines on a per occurrence basis.

**END OF SECTION**



**SECTION 01 5719**  
**INDOOR AIR QUALITY CONTROLS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Construction procedures to promote adequate indoor air quality after construction.
- B. Testing indoor air quality before commencement of construction; existing building areas only.
- C. Testing indoor air quality after completion of construction.

**1.02 PROJECT GOALS**

- A. Dust and Airborne Particulates: Prevent deposition of dust and other particulates in HVAC ducts and equipment.
  - 1. Cleaning of ductwork is not contemplated under this Contract.
  - 2. Contractor shall bear the cost of cleaning required due to failure to protect ducts and equipment from construction dust.
  - 3. Establish condition of existing ducts and equipment prior to start of alterations.
- B. Airborne Contaminants: Procedures and products have been specified to minimize indoor air pollutants.
  - 1. Furnish products meeting the specifications.
  - 2. Avoid construction practices that could result in contamination of installed products leading to indoor air pollution.

**1.03 REFERENCE STANDARDS**

- A. ASHRAE Std 52.2 - Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size 2017, with Addendum (2022).
- B. ASHRAE Std 129 - Measuring Air-Change Effectiveness 1997 (Reaffirmed 2002).
- C. ASTM E779 - Standard Test Method for Determining Air Leakage Rate by Fan Pressurization 2019.
- D. SMACNA (OCC) - IAQ Guidelines for Occupied Buildings Under Construction 2007.

**1.04 DEFINITIONS**

- A. Adsorptive Materials: Gypsum board, acoustical ceiling tile and panels, carpet and carpet tile, fabrics, fibrous insulation, and other similar products.
- B. Contaminants: Gases, vapors, regulated pollutants, airborne mold and mildew, and the like, as specified.
- C. Particulates: Dust, dirt, and other airborne solid matter.
- D. Wet Work: Concrete, plaster, coatings, and other products that emit water vapor or volatile organic compounds during installation, drying, or curing.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Indoor Air Quality Management Plan: Describe in detail measures to be taken to promote adequate indoor air quality upon completion; use SMACNA (OCC) as a guide.
  - 1. Submit not less than 60 days before enclosure of building.
  - 2. Identify potential sources of odor and dust.
  - 3. Identify construction activities likely to produce odor or dust.
  - 4. Identify areas of project potentially affected, especially occupied areas.
  - 5. Evaluate potential problems by severity and describe methods of control.
  - 6. Describe construction ventilation to be provided, including type and duration of ventilation, use of permanent HVAC systems, types of filters and schedule for replacement of filters.
  - 7. Describe cleaning and dust control procedures.
  - 8. Describe coordination with commissioning procedures.

- C. Interior Finishes Installation Schedule: Identify each interior finish that either generates odors, moisture, or vapors or is susceptible to adsorption of odors and vapors, and indicate air handling zone, sequence of application, and curing times.
- D. Duct and Terminal Unit Inspection Report.
- E. Indoor Air Quality Testing Plan: Identify:
  - 1. Testing agency qualifications.
  - 2. Locations and scheduling of air sampling.
  - 3. Test procedures, in detail.
  - 4. Test instruments and apparatus.
  - 5. Sampling methods.
- F. Indoor Air Quality Testing Reports: Show:
  - 1. Location where each sample was taken, and time.
  - 2. Test values for each air sample.
  - 3. HVAC operating conditions.
  - 4. Certification of test equipment calibration.
  - 5. Other conditions or discrepancies that might have influenced results.
  - 6. Interpretation of test results.
  - 7. Recommendations for improvement of indoor air quality or retesting.

#### **1.06 QUALITY ASSURANCE**

- A. Firm Qualifications: The indoor air quality testing firm must have a minimum of five years experience specifically in the indoor environmental quality field and must have indoor environmental testing and consulting capabilities. Firm should be a licensed mold assessment company (ACO) through the Texas Department of Licensing and Regulation (TDLR), and should have a minimum of one mold assessment consultant (MAC) on staff. Additionally, the firm's consultants should maintain current certification in indoor environmental consulting (i.e. Certified Indoor Environmental Consultant (CIEC) through the American Council for Accredited Certification (ACAC) or other certifying association. The firm should employ a LEED-Accredited Professional, certified by the United States Green Building Council (USGBC).
- B. Laboratory Qualifications: The microbiology testing laboratory utilized by the consulting firm should have a minimum of five years experience, be a licensed mold analysis laboratory through the Texas Department of Licensing and Regulation (TDLR), and should employ a degreed mycologist. The industrial hygiene laboratory utilized by the consulting firm should have a minimum of five years experience, and be accredited by the American Industrial Hygiene Association (AIHA).

### **PART 2 PRODUCTS**

#### **2.01 MATERIALS**

- A. Low VOC Materials: See other sections for specific requirements for materials with low VOC content.
- B. Auxiliary Air Filters: MERV of 8, minimum, when tested in accordance with ASHRAE Std 52.2.

### **PART 3 EXECUTION**

#### **3.01 CONSTRUCTION PROCEDURES**

- A. Prevent the absorption of moisture and humidity by adsorptive materials by:
  - 1. Sequencing the delivery of such materials so that they are not present in the building until wet work is completed and dry.
  - 2. Delivery and storage of such materials in fully sealed moisture-impermeable packaging.
  - 3. Provide sufficient ventilation for drying within reasonable time frame.
- B. Begin construction ventilation when building is substantially enclosed.
- C. If extremely dusty or dirty work must be conducted inside the building, shut down HVAC systems for the duration; remove dust and dirt completely before restarting systems.

- D. When working in a portion of an occupied building, prevent movement of air from construction area to occupied area. Provide pre-construction air filters to all return air registers in adjacent occupied areas.
- E. Use of HVAC equipment and ductwork for ventilation during construction is not permitted:
  - 1. Provide temporary ventilation equivalent to 1.5 air changes per hour, minimum.
  - 2. Exhaust directly to outside.
  - 3. Seal HVAC air inlets and outlets immediately after duct installation.
- F. Do not store construction materials or waste in mechanical or electrical rooms.
- G. Prior to use of return air ductwork without intake filters clean up and remove dust and debris generated by construction activities.
  - 1. Inspect duct intakes, return air grilles, and terminal units for dust.
  - 2. Clean plenum spaces, including top sides of lay-in ceilings, outsides of ducts, tops of pipes and conduit.
  - 3. Clean tops of doors and frames.
  - 4. Clean mechanical and electrical rooms, including tops of pipes, ducts, and conduit, equipment, and supports.
  - 5. Clean return plenums of air handling units.
  - 6. Remove intake filters last, after cleaning is complete.
- H. Do not perform dusty or dirty work after starting use of return air ducts without intake filters.
- I. Use other relevant recommendations of SMACNA (OCC) for avoiding unnecessary contamination due to construction procedures.

### **3.02 INDOOR AIR QUALITY TESTING (IAQ)**

- A. On-site Observations
  - 1. A minimum of two (2) visits for renovations and up to six (6) site visits for new construction will be made to the site to conduct on-site observations during the construction phase relative to water intrusion issues or other building conditions that might cause future degradation to indoor air quality. These observations may include but are not limited to landscape grade and drainage, foundation height, exterior wall sealing, roof and wall enclosure penetrations, water or moisture intrusion, plumbing, storage and condition of absorbent building materials, sealing and hygiene of HVAC systems, control of particulates, etc.
  - 2. This phase may also include a review of specifications for building products such as paint, adhesives, carpet, and cabinetry for products that might degrade future indoor air quality when installed.
  - 3. A written report will be submitted to the Architect or Owner's representative after each on-site observation. The report will include project conditions on the day of inspection along with cited potential problems areas and photo-documentation as needed.
    - a. Critical Condition Report: If a condition is cited that may cause potential microbial contamination in area that is ready to be sealed or covered, a verbal report will be communicated to the Architect or Owner's representative within one business day so the Contractor can have the condition corrected before work is continued.
    - b. Standard Report: A written report will be submitted to the Architect or Owner's representative within ten (10) working days of the site visit.
- B. Pre-Construction Inspection and Sampling: Perform indoor air quality testing before starting construction, as base line for evaluation of post-construction testing.
  - 1. If the construction project is an addition to an existing facility, pre-construction inspection and sampling will be conducted to determine baseline conditions within the existing facility.
  - 2. The testing conducted in item C-2 of the pre-occupancy testing below will be conducted in areas of the existing facility that will be adjoining the new construction.

3. During construction activities on-site observations will include any impact to the indoor air quality of the existing facility.
- C. Pre-Occupancy Inspection and Sampling: Perform indoor air quality testing before occupancy.
1. After substantial completion of the facility and before non-fixed furnishings are delivered, the firm will conduct an IAQ inspection and perform representative sampling for indoor air quality parameters. These measurements will establish background pre-occupancy conditions, and will be evaluated for acceptable levels. All samples collected will be area screening samples to determine the presence of the parameters of interest. If the screening results indicate significant positive results, additional investigation may be required.
  2. The air quality sampling includes the collection of samples for the determination of populations and concentrations of total fungal bioaerosols in the ambient air. The sampling also includes the collection of chemical samples for fixed gas analysis for total volatile organic compounds (TVOCs), methane, carbon dioxide, and carbon monoxide. Additional real-time monitoring will be conducted for the following parameters: temperature, relative humidity, carbon dioxide, carbon monoxide, TVOCs, ozone, and large (2.5 to 10 microns) and small particulates (<2.5 microns).
  3. Testing in a school facility will include the collection of samples in representative areas of the classroom wings (to include a minimum of 20% of the classrooms), and if part of the new construction, in the cafeteria, library, administration offices, gymnasium, and locker rooms. Additionally, two outdoor samples will be collected on each day of testing for comparison purposes.
  4. If significant areas of rubber-backed carpeting and/or composite fixed furnishings are present in the facility, testing will also be conducted in representative areas for 4-phenylcyclohexene and formaldehyde in the ambient air. This testing will not be conducted if carpeting and fixed furnishings have been installed which are certified to be free of these chemicals.
  5. Testing for radon should be conducted only for subterranean structures or in geographical areas where radon has been previously documented on a reoccurring basis.
  6. Testing for lead-based paint and asbestos-containing materials will not be conducted unless there is an indication that lead-based paint and/or asbestos-containing materials may be present in the existing structure, and that it may be impacted by the new construction activities. Historical asbestos testing records, asbestos management plans, or lead-based paint surveys may be provided in lieu of testing.
  7. A report of findings and any recommendations will be provided within fifteen (15) working days of the sampling event.
- D. Do not start pre-occupancy indoor air quality testing until:
1. All construction is complete, including interior finishes.
  2. HVAC systems have been tested, adjusted, and balanced for proper operation.
  3. Cleaning of inside of HVAC ductwork, if specified elsewhere, has been completed.
  4. New HVAC filtration media have been installed.
- E. Post-Occupancy Inspection and Sampling:
1. At five (5) months and eleven (11) months following substantial completion, but prior to the one (1) year project inspection, the testing conducted in item C-2 of the pre-occupancy testing above will be repeated.
  2. A report of findings and any recommendations will be provided within fifteen (15) working days of the sampling event.
- F. Indoor Air Quality Acceptance Criteria
1. Upon completion of the project, the indoor air quality testing firm will provide a report of findings to the Architect or Owner's representative indicating any IAQ parameters that do not meet the acceptance criteria.
  2. The following criteria will be used to determine acceptance:

- a. Fungal Bioaerosols - measure in relation to outdoor air, generally not higher than outdoor air, and containing indoor populations and concentrations of fungi that are considered normal and typical. Use professional judgment of testing firm.
  - b. Carbon Monoxide - measure in ppm, in relation to outdoor air. Not more than 2 ppm over outdoor air levels, and less than 9 ppm.
  - c. Carbon Dioxide - measure in ppm, in relation to outdoor air. Not more than 700 ppm higher than outdoor air.
  - d. Methane - measure in ppm. Not more than 5 ppm.
  - e. Total Volatile Organic Compounds (TVOCs) - measure in ppm as methane, or micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) - not more than outdoor air, and less than 5 ppm (calculated as methane) or 3,000  $\mu\text{g}/\text{m}^3$ .
  - f. Total Particulates - measure in total particle counts per cubic foot - total particle counts generally less than one-half ( $1/2$ ) of outdoor air. Particle counts broken down to small ( $<2.5$  microns) and large (2.5 to 10 microns).
  - g. Radon - less than 2 picoCuries per liter (pCi/L).
  - h. Ozone - not more than outdoor air, and less than 0.1 ppm.
  - i. Formaldehyde - measure in parts per million (ppm) - less than 0.050 ppm.
  - j. 4-Phenylcyclohexene(if rubber-backed products) - measure in micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) - not more than 6.5  $\mu\text{g}/\text{m}^3$ .
  - k. Lead - have paint supplier or contractor provide documentation of lead-free paint.
- G. If air samples show concentrations higher than those specified, ventilate with 100 percent outside air and retest at no cost to Owner.

**END OF SECTION**





**SECTION 01 6000  
PRODUCT REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. General product requirements.
- B. Re-use of existing products.
- C. Transportation, handling, storage and protection.
- D. Product option requirements.
- E. Substitution limitations.
- F. Procedures for Owner-supplied products.
- G. Maintenance materials, including extra materials, spare parts, tools, and software.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 4000 - Quality Requirements: Product quality monitoring.

**1.03 REFERENCE STANDARDS**

- A. 16 CFR 260.13 - Guides for the Use of Environmental Marketing Claims; Federal Trade Commission; Recycled Content Current Edition.
- B. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

**1.04 SUBMITTALS**

- A. Shop drawings, product data, and samples under provisions of Section 01 3000.

**PART 2 PRODUCTS**

**2.01 EXISTING PRODUCTS**

- A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.
- B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.
- C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.
- D. Specific Products to be Reused: The reuse of certain materials and equipment already existing on the project site is not prohibited.
  - 1. If reuse of other existing materials or equipment is desired, submit substitution request.
  - 2. All items called for on the drawings to be salvaged, removed and relocated shall be inventoried, removed and stored until such time as they are to be installed in their new location. The inventory list shall be given to the Owner and shall include an itemized list that includes quantities, descriptions and condition of each item. These items are considered to be in good operating condition at the time the contract is signed, and shall remain the property of Owner. These items shall be properly protected by the contractor and removed by him, complete, including all appurtenances and reinstalled in their new location in good working order with any modifications called for by the drawings.

**2.02 NEW PRODUCTS**

- A. Provide new products unless specifically required or permitted by Contract Documents.
- B. Where other criteria are met, Contractor shall give preference to products that:
  - 1. Are extracted, harvested, and/or manufactured closer to the location of the project.
  - 2. Have longer documented life span under normal use.

3. Are made of recycled materials.
  4. If made of wood, are made of sustainably harvested wood, wood chips, or wood fiber.
- C. Provide interchangeable components of the same manufacture for components being replaced unless noted otherwise in the contract documents.

### **2.03 PRODUCT OPTIONS**

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

### **2.04 MAINTENANCE MATERIALS**

- A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
- B. Deliver to Project site and place in location as directed; obtain receipt prior to final payment.

## **PART 3 EXECUTION**

### **3.01 SUBSTITUTION PROCEDURES**

- A. All substitutions shall be submitted on the Architects form as described in paragraph 3.03.
- B. Product Substitution - Prior to Bid
1. No products shall be used on the project unless they are specified or have received prior approval.
  2. Products to be reviewed prior to bid shall be submitted and reviewed under the provisions of this section.
  3. Substitution request including all required documentation must be delivered to the Architect's office no later than ten (10) calendar days prior to the proposal date designated in the project manual. Requests submitted late will not be considered.
  4. No product will be considered "as equal" to the product specified until it has been included as an allowable substitution, in a written Addendum to the project.
- C. Product Substitution - Post Contract Award
1. Product substitutions are not allowed except for the following provisions:
    - a. Product is required for compliance with interpretation with code compliance.
    - b. Product specified is unavailable.
    - c. Product proposed will provide a credit to the Owner.
      - 1) Contractor shall provide amount of proposed savings on the substitution request form.
    - d. Product proposed will provide a substantial benefit to the Owner's schedule.
      - 1) Contractor shall clearly delineate the positive impact to the project schedule.
    - e. Product supplier contractor default.
      - 1) Written documentation will be required to substantiate request.
  2. Substitution request including all required documentation must be delivered to the Architect's office no later than fifteen (15) calendar days after execution of the Contract.
  3. Reimbursement of Architect's costs
    - a. In the event substitutions are proposed to the Architect after the Contract has been awarded, the Architect will record all time used by him and by his consultants in evaluation of each such proposed substitution.
    - b. Whether or not the Architect approves a proposed substitution, the Contractor promptly upon receipt of the Architect's billing shall reimburse the Architect at the rate of two and one-half times the direct cost to the Architect and his consultants for all time spent by them in evaluating the proposed substitution.

### **3.02 QUALITY ASSURANCE**

- A. Regulatory Requirements:

1. Proposed product substitution shall comply with all applicable codes. Products not conforming to codes shall be removed and replaced at Contractors expense.
- B. Coordination of substitutions:
  1. Prior to each product substitution, carefully review and coordinate all aspects of each item being submitted.
  2. Verify that each item and the submittal for it conform in all respects with the specified requirements.
  3. By submitting the substitution request form with each submittal, the contractor certifies that this coordination has been performed.
- C. Substitutions:
  1. The Contract is based on the standards of quality established in the Contract Documents.
  2. Products specified by reference to standard specifications such as ASTM and similar standards do not require further approval.
  3. Do not substitute materials, equipment, or methods unless such substitution has been specifically approved in writing for this Work by the Architect.
- D. Coordination of Materials and Installation
  1. General contractor shall install all fire protection, electrical and data wiring in conduit as high as possible and above mechanical ductwork. General contractor shall install all fire protection, electrical, data, and wiring in conduit in areas designated on the plans while coordinating structure, mechanical equipment/ductwork, lighting, building controls, and architectural systems. The proposed layout of these systems and conduit shall be reviewed with and accepted by the architect prior to installation. Systems and conduit shall group in the area designated by the construction documents in an orderly and clean installation. Final locations and conditions of these systems and conduit shall only be accepted by the architect upon review after installation.
- E. Miscellaneous Materials
  1. If proposed product substitution requires additional materials or accessories for installation in the project, Contractor shall be responsible for all costs.
- F. Finishes
  1. Proposed product substitution shall not decrease the selection of colors or finishes.
- G. Storage and Handling
  1. Include within the Contractor's quality assurance program such procedures as are required to assure full protection of work and materials.
- H. Warranty
  1. Warranty of product shall not be less than that of specified product.

### **3.03 PRODUCT SUBSTITUTION REQUEST FORM**

- A. The Architect's "Substitution Request Form" must be used for each product submitted for consideration. The form is attached following this Section.
- B. The Individual or Firm requesting a substitution must document that the requested substitution is equal or superior to the specified product. Failure to provide clear, accurate, and adequate documentation will be grounds for rejection. Any re-submittal will be handled as a new request.
- C. Required documentation shall consist of applicable information which would aid the Architect in making an informed decision. Include side by side product comparisons, technical data, laboratory test results, product drawings, etc. References shall include three projects, which are from one to two years old, and three projects older than five years. Provide a list of references with the owners contact name and phone number.
- D. If use of the proposed product would result in changes to the design of the building, the submittal shall describe fully the changes required to the drawings or project manual. Any cost differences resulting from modifications to the drawings and project manual and the cost of making the changes shall be borne by the Product Supplier.

- E. Incomplete forms shall be rejected. The decision of the Architect is final.

### **3.04 OWNER-SUPPLIED PRODUCTS**

- A. Owner's Responsibilities:
1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
  2. Arrange and pay for product delivery to site.
  3. On delivery, inspect products jointly with Contractor.
  4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
  5. Arrange for manufacturers' warranties, inspections, and service.
- B. Contractor's Responsibilities:
1. Review Owner reviewed shop drawings, product data, and samples.
  2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
  3. Handle, store, install and finish products.
  4. Repair or replace items damaged after receipt.
  5. Coordinate dimensions of Owner furnished materials and equipment with drawings and specifications prior to installation to ensure proper fit in conjunction with other Contractor supplied materials and equipment.

### **3.05 TRANSPORTATION AND HANDLING**

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- D. Transport and handle products in accordance with manufacturer's instructions.
- E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged in manufacturer's original container with labels intact and legible.
1. Maintain packaged materials with seals unbroken and labels intact until time of use.
  2. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the Owner.
- G. The Architect may reject as non-complying such material and products that do not bear identification and satisfactory to the Architect as to manufacturer, grade, quality, and other pertinent information.
- H. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
- I. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

### **3.06 STORAGE AND PROTECTION**

- A. Provide protection of stored materials and products against theft, casualty, or deterioration.
- B. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.

- C. Store and protect products in accordance with manufacturers' instructions. Failure to comply will result in rejection of products for use on job.
- D. Store with seals and labels intact and legible.
- E. Arrange storage of materials and products to allow for visual inspection for the purpose of determination of quantities, amounts, and unit counts.
- F. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.
- G. For exterior storage of fabricated products, place on sloped supports above ground.
- H. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
- I. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- J. Comply with manufacturer's warranty conditions, if any.
- K. Do not store products directly on the ground.
- L. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- M. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- N. Prevent contact with material that may cause corrosion, discoloration, or staining.
- O. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- P. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.
- Q. In event of damage, promptly make replacements and repairs to the approval of the Architect and at no additional cost to the Owner.
- R. Additional time required to secure replacements and to make repairs will not be considered by the Architect to justify an extension in the Contract Time of Completion.

**END OF SECTION**





## MORE THAN ARCHITECTS

# INSTRUCTIONS FOR USE OF SUBSTITUTION REQUEST FORM

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### STEPS

1. Substitution request **including all required documentation** must be emailed to the Project Leader at the Architects office no later than the date indicated in the specifications. Requests submitted late will not be considered. Contact information can be found on the Huckabee website bidding section under the specific project at: [www.huckabee-inc.com/construction/](http://www.huckabee-inc.com/construction/)
2. The Huckabee "Substitution Request Form" must be used for each project submitted for consideration.
3. The Individual or Firm requesting a substitution must document that the requested substitution is equal or superior to the specified product. Failure to provide clear, accurate, and adequate documentation will be grounds for rejection. Any re-submittal will be handled as a new request.
4. Required documentation shall consist of applicable information which would aid the Architect in making an informed decision. Include **side-by-side product comparisons**, technical data, laboratory test results, product drawings, etc. References shall include three projects which are from one to two years old, and three projects older than five years. Provide a list of references with the owner's contact name and telephone number.
5. If use of the proposed product would result in changes to the design of the building, the submittal shall describe fully the changes required to the drawings or specifications. Any cost differences resulting from modifications to the drawings and specifications and the cost of making the changes shall be borne by the Product Supplier.
6. **No** product will be considered "as equal" to the product specified until it has been included as an allowable substitution in a written Addendum to the project.
7. The decision of the Architect is final.



## MORE THAN ARCHITECTS

# SUBSTITUTION REQUEST FORM

Architect Project No: \_\_\_\_\_

Bid Date: \_\_\_\_\_

Date of Request: \_\_\_\_\_

Project Name: \_\_\_\_\_

### SUBSTITUTION REQUEST BY:

Firm: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

Fax: \_\_\_\_\_

**We hereby request that the following Substitution be allowed in lieu of the Product specified on the above project.**

### ARCHITECT / ENGINEERS RESPONSE:

☐ APPROVED

☐ APPROVED AS NOTED

☐ NOT APPROVED

☐ SUBMITTED TOO LATE

☐ FAILED TO PROVIDE ADEQUATE INFORMATION

REMARKS: \_\_\_\_\_

\_\_\_\_\_

BY: \_\_\_\_\_ DATE: \_\_\_\_\_

SPECIFIED PRODUCT \_\_\_\_\_ SPECIFICATION SECTION \_\_\_\_\_

PROPOSED PRODUCT SUBSTITUTION \_\_\_\_\_

This request includes the following: attached Technical Data, Laboratory Tests and proposed changes to the Drawings and Specifications, which the proposed Substitution will require for proper installation.

\_\_\_\_\_

\_\_\_\_\_

The Firm requesting the Substitution agrees to pay for changes to the building design, including Architectural, Engineering, and detailing costs caused by the requested Substitution.

☐ YES

☐ NO

☐ NOT APPLICABLE

What effect does the Substitution have on other trades? \_\_\_\_\_

\_\_\_\_\_

What effect does Substitution have on Construction Schedule? \_\_\_\_\_

\_\_\_\_\_

Differences between proposed Substitution and specified item? \_\_\_\_\_

\_\_\_\_\_

Manufacturer's guarantees of the proposed and specified items are: \_\_\_\_\_ Same \_\_\_\_\_ Different  
(If different, explain on attachment)

The undersigned state that the function, appearance and quality are equivalent or superior to the specified item.

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
TITLE

\_\_\_\_\_  
DATE

**Huckabee**



**SECTION 01 6210  
SCHEDULE OF MATERIALS AND COLORS**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Information and procedures for color submission for color schedule.
- B. Schedule of Materials and Colors for pre-selected colors.

**1.02 COLOR SCHEDULE PROCEDURES - PRE-BID SELECTED**

- A. Contractor shall hold color samples requiring color selections until all are received. Only then shall the actual color samples be submitted to the Architect for selection. Colors samples matching color schedule shall not be submitted until field sample verifications are required.
  - 1. Contractor shall submit a complete transmittal letter with each related group of items. Each sample shall be properly labeled with the name of the project, contractor, manufacturer, and date of submission. Incomplete color submittals will be returned to the Contractor.
  - 2. The Contractor shall allow two (2) weeks after all colors are submitted for final Owner approval.

**1.03 COLOR SCHEDULE PROCEDURES - POST-BID SELECTED**

- A. Contractor shall hold all color samples until all items requiring color selections are received. Only then shall the actual color samples be submitted to the Architect for selection.
  - 1. Colors are noted on the drawings, and as specified. Where colors are not specified, Architect will select color with final color schedule.
  - 2. Contractor shall submit a complete transmittal letter with each related group of items. Each sample shall be properly labeled with the name of the project, contractor, manufacturer, and date of submission. Incomplete color submittals will be returned to the Contractor.
  - 3. The Contractor shall allow five (5) weeks after all colors are submitted for final Owner approval.

**1.04 COLORS AND PATTERNS**

- A. Unless the precise color and pattern is specifically called out in the Contract Documents, and whenever a choice of color or pattern is available in the specified products, submit accurate color and pattern charts to the Architect for selection.
- B. Verify all graphics with the Architect before proceeding. Graphics may need to be adjusted to reflect the same composition as that shown on the drawings.

**1.05 SUBMITTALS**

- A. Field Samples
  - 1. Once colors are selected, and received at the job site and prior to application or installation, the Contractor shall submit one (1) sample of each item to the Architect for verification of color and pattern.
  - 2. The Contractor shall allow five (5) working days from date of receipt of submission for verification notification.

**1.06 SCHEDULING**

- A. Contractor shall submit all products in a timely manner to avoid project delays for long lead time items.

**PART 2 - PRODUCTS**

**2.01 MANUFACTURERS**

- A. Manufacturers listed or named in a product or system specification are those manufacturers considered capable of manufacturing products conforming to the specification requirements.

- B. The "listing" or "naming" of a manufacturer does not imply "acceptance" or "approval" of any standard product of that manufacturer.
- C. Products listed or named manufacturers proposed for use shall be comparable in all respects to specified make or model number designation of named products and shall meet or exceed specification requirements of type, function, color, and quality.
- D. Where products are specified by naming model number and manufacturers only, the named products establish a standard of quality. Refer to individual specification sections for additional manufacturers and procedures.

## **2.02 MATERIALS - GENERAL**

- A. Colors, Textures, and Patterns: Where manufacturer's standard products are indicated for and other products requiring selection of colors, surface textures, patterns, and other appearance characteristics, provide specific products or materials complying with the following requirements:
  - 1. Provide selections made by Architect from manufacturer's full range of standard colors, textures, and patterns for products of type indicated.
  - 2. Provide trim and accessories that match color and finish unless noted otherwise.
  - 3. Where contractor is submitting a substitution, contractor shall provide color equal to that specified. Substituted colors are not considered approved unless published in writing in Addendum prior to bid. If substituted product does not match specified color, contractor shall provide custom color as required at no additional cost to the owner.

## **PART 3 - EXECUTION**

### **3.01 APPLICATION**

- A. Paint any vents, grilles, piping, columns, etc. the same color as the wall or graphic unless noted otherwise.
- B. Unless otherwise noted, all accent paint shall terminate at an inside corner. If wall terminates at storefront, wrap paint to meet edge of storefront.
- C. All exposed concrete shall be sealed.

### **3.02 SCHEDULE OF MATERIALS AND COLORS**

- A. General Notes:
  - 1. All paint colors are subject to last shade adjustments.
  - 2. The Contractor shall submit samples of all finishes for comparison and approval of colors to the items listed in the color schedule.
  - 3. Where multiple buildings occur in one project, all materials and finishes may not apply to all buildings. Refer to the drawings for material and finish locations.
  - 4. The General Contractor shall verify all colors selections and numbers and note any drawings changes that may have occurred. Notify the Architect of any discrepancies found within 14 days.
  - 5. Notes stating "See Drawings for Locations" refer to the Construction Documents.
  - 6. Where note "pending submittal" occurs, Contractor shall submit samples of the material that meets the Standards outlined in the appropriate specification for Architect's review and selection. For materials with more than one color, texture or pattern available, Contractor shall submit the Manufacturer's full range of colors, texture and patterns.
  - 7. If there is a conflict between the product, material or color specified in this Legend and the product's specification Section within the Division, notify the Architect immediately. The Schedule of Materials and Colors shall govern unless a written clarification is given.
- B. See DRAWINGS for Schedule of Materials and Colors for specific product details and requirements.

**END OF SECTION**

**SECTION 01 7000  
EXECUTION AND CLOSEOUT REQUIREMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Examination, preparation, and general installation procedures.
- B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.
- C. Pre-installation meetings.
- D. Cutting and patching.
- E. Surveying for laying out the work.
- F. Cleaning and protection.
- G. Starting of systems and equipment.
- H. Demonstration and instruction of Owner personnel.
- I. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.
- J. General requirements for maintenance service.
- K. Administration of Warranty Phase.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 1000 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.
- B. Section 01 3000 - Administrative Requirements: Submittals procedures, Electronic document submittal service.
- C. Section 01 4000 - Quality Requirements: Testing and inspection procedures.
- D. Section 01 5000 - Temporary Facilities and Controls: Temporary exterior enclosures.
- E. Section 01 7900 - Demonstration and Training: Demonstration of products and systems to be commissioned and where indicated in specific specification sections
- F. Individual Product Specification Sections:
  - 1. Advance notification to other sections of openings required in work of those sections.
  - 2. Limitations on cutting structural and load bearing members.

**1.03 REFERENCE STANDARDS**

- A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations 2022, with Errata (2021).

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
  - 1. On request, submit documentation verifying accuracy of survey work.
  - 2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in compliance with Contract Documents.
  - 3. Submit surveys and survey logs for the project record.
- C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
  - 1. Structural integrity of any element of Project.
  - 2. Integrity of weather exposed or moisture resistant element.
  - 3. Efficiency, maintenance, or safety of any operational element.
  - 4. Visual qualities of sight exposed elements.

5. Work of Owner or separate Contractor.
6. Include in request:
  - a. Identification of Project.
  - b. Location and description of affected work.
  - c. Necessity for cutting or alteration.
  - d. Description of proposed work and products to be used.
  - e. Effect on work of Owner
  - f. Date and time work will be executed.

#### **1.05 QUALIFICATIONS**

- A. For demolition work, employ a firm specializing in the type of work required.
  1. Minimum of 5 years of documented experience.
- B. For surveying work, employ a land surveyor registered in Texas and acceptable to Architect. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,
- C. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in Texas. Employ only individual(s) trained and experienced in establishing and maintaining horizontal and vertical control points necessary for laying out construction work on project of similar size, scope and/or complexity.
- D. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in Texas.

#### **1.06 PROJECT CONDITIONS**

- A. Use of explosives is not permitted.
- B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- C. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- D. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- E. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
  1. Provide dust-proof enclosures to prevent entry of dust generated outdoors.
  2. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.
- F. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
  1. Minimize amount of bare soil exposed at one time.
  2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
  3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
  4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
- G. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
  1. Outdoors: Limit conduct of especially noisy exterior work to the hours of 8 am to 5 pm.
  2. Indoors: Limit conduct of especially noisy interior work to 8 am to 5 pm.
- H. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

1. Pest Control Service: Monthly treatments.
- I. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
- J. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

#### **1.07 COORDINATION**

- A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Notify affected utility companies and comply with their requirements.
- C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- F. Coordinate completion and clean-up of work of separate sections.
- G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

### **PART 2 PRODUCTS**

#### **2.01 PATCHING MATERIALS**

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 6000 - Product Requirements.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

- G. Prior to start of work, photo and/or video document all portions of the building.

### **3.02 PREPARATION**

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

### **3.03 PREINSTALLATION MEETINGS**

- A. When required in individual specification sections, Contractor will convene a preinstallation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section. Contractor, subcontractor, and manufacturer's representative shall be present.
- C. Notify Architect seven (7) days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
  - 1. Review approved submittals.
  - 2. Review conditions of examination, preparation and installation procedures.
  - 3. Review coordination with related work.
  - 4. Installation schedule.
- E. Record minutes and distribute copies within two days after meeting to participants, with one copies to Architect, Owner, participants, and those affected by decisions made.
- F. Pre-installation meeting shall not be scheduled until approved submittals are verified by the Contractor.

### **3.04 LAYING OUT THE WORK**

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify Architect of any discrepancies discovered.
- C. Contractor shall locate and protect survey control and reference points.
- D. Control datum for survey is that indicated on drawings.
- E. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- F. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- G. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
- H. Utilize recognized engineering survey practices.
- I. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
  - 1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
  - 2. Grid or axis for structures.
  - 3. Building foundation, column locations, ground floor elevations.
- J. Periodically verify layouts by same means.
- K. Maintain a complete and accurate log of control and survey work as it progresses.

### **3.05 GENERAL INSTALLATION REQUIREMENTS**

- A. In addition to compliance with regulatory requirements, conduct construction operations in compliance with NFPA 241, including applicable recommendations in Appendix A.

- B. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- C. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- D. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- E. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- F. Make neat transitions between different surfaces, maintaining texture and appearance.

### **3.06 NOTIFICATION OF ARCHITECT**

- A. The Contractor shall notify the Architect a minimum of 48 hours prior to the covering up of any work in progress, in order for the architect to make proper field observations of the work in place. The Contractor shall place NO concrete, fill-in ditches, or cover up walls or ceilings without first contacting the Architect, as noted above and receiving approval.

### **3.07 ALTERATIONS**

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
  - 1. Verify that construction and utility arrangements are as indicated.
  - 2. Report discrepancies to Architect before disturbing existing installation.
  - 3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.
  - 1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 5000 in locations indicated on drawings.
  - 2. Provide sound retardant partitions of construction indicated on drawings in locations indicated on drawings.
- C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
  - 1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.
  - 2. Insulate existing ducts or pipes that are exposed to outdoor ambient temperatures by alterations work.
- D. Remove existing work as indicated and as required to accomplish new work.
  - 1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
  - 2. Remove items indicated on drawings.
  - 3. Relocate items indicated on drawings.
  - 4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
  - 5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
- E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, Telecommunication, and Technology): Remove, relocate, and extend existing systems to accommodate new construction.
  - 1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
  - 2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.

3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
  - a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
  - b. Provide temporary connections as required to maintain existing systems in service.
4. Verify that abandoned services serve only abandoned facilities.
5. Remove abandoned pipe, ducts, conduits, and equipment including those above acoustical lay-in ceilings and gypsum board/hard ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.
- F. Protect existing work to remain.
  1. Prevent movement of structure; provide shoring and bracing if necessary.
  2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
  3. Repair adjacent construction and finishes damaged during removal work.
- G. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
  1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
  2. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
  3. Where a change of plane of 1/4 inch or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.
- H. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.
- I. Refinish existing surfaces as indicated:
  1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
  2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.
- J. Clean existing systems and equipment.
- K. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.
- L. Do not begin new construction in alterations areas before demolition is complete.
- M. Comply with all other applicable requirements of this section.

### **3.08 CUTTING AND PATCHING**

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. See Alterations article above for additional requirements.
- C. Perform whatever cutting and patching is necessary to:
  1. Complete the work.
  2. Fit products together to integrate with other work.
  3. Provide openings for penetration of mechanical, electrical, and other services.
  4. Match work that has been cut to adjacent work.
  5. Repair areas adjacent to cuts to required condition.
  6. Repair new work damaged by subsequent work.
  7. Remove samples of installed work for testing when requested.
  8. Remove and replace defective and non-complying work.



- D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- E. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- G. Restore work with new products in accordance with requirements of Contract Documents.
- H. Fit work air tight at interior and weathertight at exterior to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 8400, to full thickness of the penetrated element.
- J. Patching:
  - 1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
  - 2. Match color, texture, and appearance.
  - 3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

### **3.09 PROGRESS CLEANING**

- A. General:
  - 1. Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing required protection of materials.
  - 2. Do not allow accumulation of scrap, debris, waste material, and other items not required for construction of this Work.
  - 3. At least twice each month, and more often if necessary, completely remove all scrap, debris, and waste material from the job site.
  - 4. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the ecology.
- B. Site:
  - 1. Daily, and more often if necessary, inspect the site and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.
  - 2. Weekly, and more often if necessary, inspect all arrangements of materials stored on the site. Restack, tidy, or otherwise service arrangements to meet the requirements of subparagraph A.1 above.
  - 3. Maintain the site in a neat and orderly condition at all times.
- C. Structures:
  - 1. Weekly, and more often if necessary, inspect the structures and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.
  - 2. Weekly, and more often if necessary, sweep interior spaces clean.
    - a. "Clean", for the purpose of this subparagraph, shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and a hand-held broom.
  - 3. As required preparatory to installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using equipment and materials required to achieve the necessary cleanliness.

4. Following the installation of finish floor materials, clean the finish floor daily (and more often if necessary) at all times while work is being performed in the space in which finish materials are installed. Damaged floors will be removed and replaced.
  - a. "Clean", for the purpose of this subparagraph, shall be interpreted as meaning free from foreign material which, in the opinion of the Architect, may be injurious to the finish floor material.

### **3.10 PROTECTION OF INSTALLED WORK**

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- G. Prohibit traffic from landscaped areas.
- H. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

### **3.11 SYSTEM STARTUP**

- A. Coordinate with General Commissioning Requirements per Mechanical Specifications.
- B. Coordinate schedule for start-up of various equipment and systems.
- C. Notify Architect and Owner 14 days prior to start-up of each item.
- D. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
- E. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- F. Verify that wiring and support components for equipment are complete and tested.
- G. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
- H. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- I. Submit a written report that equipment or system has been properly installed and is functioning correctly.

### **3.12 DEMONSTRATION AND INSTRUCTION**

- A. See Section 01 7900 - Demonstration and Training.
- B. Refer to individual specification sections for more specific demonstration and training requirements.

### **3.13 ADJUSTING**

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.
- B. Testing, adjusting, and balancing HVAC systems: See Division 23 for specific requirements.

### **3.14 FINAL CLEANING**

- A. "Clean", for the purpose of this Article, and except as may be specifically provided otherwise, shall be interpreted as meaning the level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and materials.
- B. The Contractor shall have initial cleaning complete prior to the Architect performing the "Punch List" walkthrough. The building shall be thoroughly (ready for occupancy) cleaned prior to the Owner acceptance (Substantial Completion) of the building.
- C. Prior to completion of the Work, remove from the job site all tools, surplus materials, equipment, scrap, debris, and waste. Conduct final progress cleaning as described in the Article above.
- D. Site:
  - 1. Unless otherwise specifically directed by the Architect, broom clean paved areas on the site and public paved areas adjacent to the site. Powerwash paved surfaces, as required, to remove any stains caused by construction materials, vehicles, or workers, as approved by the Architect, and at no additional cost to the Owner.
  - 2. Completely remove resultant debris.
- E. Structures:
  - 1. Exterior:
    - a. Visually inspect exterior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter.
    - b. Remove all traces of splashed materials from adjacent surfaces.
    - c. If necessary to achieve a uniform degree of cleanliness, hose down the exterior of the structure.
    - d. In the event of stubborn stains not removable with water, the Architect may require light sandblasting or other cleaning at no additional cost to the Owner.
  - 2. Interior:
    - a. Visually inspect all interior surfaces (floors, walls, ceilings, fixtures, furniture, appliances, and equipment) and remove all traces of soil, waste materials, smudges, and other foreign matter.
    - b. Remove all traces of splashed material from adjacent surfaces.
    - c. Remove paint droppings, spots, stains, and dirt from finished surfaces.
  - 3. Glass: Clean inside and outside.
  - 4. Polished surfaces: To surfaces requiring routine application of buffed polish, apply the polish recommended by the manufacturer of the material being polished.
- F. Schedule final cleaning as approved by the Architect to enable the Owner to accept a completely clean Work.

### **3.15 CLEANING DURING OWNER'S OCCUPANCY**

- A. Should the Owner occupy the Work or any portion thereof prior to its completion by the Contractor and acceptance by the Owner, responsibilities for interim and final cleaning shall be as determined by the Architect in accordance with the General Conditions of the Contract.

### **3.16 CLOSEOUT PROCEDURES**

- A. Project Closeout
  - 1. No later than 60 days prior to Project Completion, as scheduled on the Contractors Critical Path Schedule, the Contractor shall:
    - a. Develop a Project Completion List for any and all tasks that remain along with a schedule for the completion of each. This list and schedule shall be written and delivered to the Owner and Architect.
    - b. Provide "hands-on" training to the Owner of all major systems as identified in Section 01 7800 – Closeout Submittals
- B. Substantial Completion

1. Prior to requesting inspection by the Architect, use adequate means to assure that the Work is completed in accordance with the specified requirements and is ready for the requested inspection.
  2. No later than 30 days prior to the scheduled Substantial Completion date the Contractor shall call for a project walk through to determine if the project is substantially complete.
    - a. The Contractor shall prepare and submit a list of deficiency items as required by Paragraph 9.8.2 of the General Conditions. This list shall be submitted to the Architect a minimum of 7 days prior to the scheduled walk through.
    - b. The Contractor shall provide copies of the complete TAB (Commissioning) report and verification that all repairs have been made and that the systems are operational. This report and verification shall be submitted to the Architect a minimum of 7 days prior to the scheduled walk through.
    - c. The Contractor shall obtain the Certificate of Occupancy from the AHJ and supply a copy to the Architect a minimum of 7 days prior to the scheduled walk through and before substantial completion will be issued.
    - d. On the scheduled date of the walk through and after receipt of the deficiency list (punch list) the Architect will inspect the project to determine the status of completion.
    - e. Following inspection of the work, the Architect determines that the work is not substantially complete:
      - 1) The Architect promptly will so notify the Contractor, in writing, giving the reasons therefore.
      - 2) The Contractor shall remedy the deficiencies and notify the Architect when ready for re-inspection. The Architect will make only one trip to re-inspect the project.
      - 3) The Architect shall be entitled to reimbursement of costs on an hourly basis for time spent to re-inspect the project. Rate for reimbursement shall be two hundred dollars per hour (\$200.00/hr) including travel time and shall be charged against the Contractor's retainage held for this work.
  3. When the Architect concurs that the Work is substantially complete:
    - a. The Architect will prepare a "Certificate of Substantial Completion" on AIA Form G704, accompanied by the Contractor's list of items to be completed or corrected, as verified by the Architect.
    - b. The Architect will submit the Certificate to the Owner and to the Contractor for their written acceptance of the responsibilities assigned to them in the Certificate.
- C. Final Completion
1. Prepare and submit the notice required by the first sentence of Paragraph 9.10.1 of the General Conditions.
  2. Verify that the Work is complete including, but not necessarily limited to, the items mentioned in Paragraph 9.8.2 of the General Conditions.
  3. Certify that:
    - a. Contract Documents have been reviewed;
    - b. Work has been inspected for compliance with the Contract Documents;
    - c. Work has been completed in accordance with the Contract Documents;
    - d. Equipment and systems have been tested as required, and are operational;
    - e. Work is completed and ready for final inspection.
  4. The Architect will make an inspection to verify status of completion.
  5. Should the Architect determine that the Work is incomplete or defective:
    - a. The Architect promptly will so notify the Contractor, in writing, listing the incomplete or defective work.
    - b. Remedy the deficiencies promptly, and notify the Architect when ready for re-inspection.
  6. When the Architect determines that the Work is acceptable under the Contract Documents, he will request the Contractor to make closeout submittals.
-

D. Closeout Submittals

1. Closeout submittals as described in Section 01 7800 and Architect approval secured.
2. Refer attached Check List.
3. Contractor shall deliver all attic stock referenced in specifications. Attic stock shall be delivered to owners designated location. Contractor shall obtain a signed receipt of delivery.
4. Contractor shall obtain Certificate of Occupancy from the AHJ and submit a copy to the Architect.

E. Release of Funds

1. Retainage for the project will be held until project closeout is complete as verified by the items in paragraph above and the attached Check List including the completion of all Punch List items.
2. The Architect will estimate the cost of each item on the Punch List, withholding funds for each which shall be separate from the retainage. These funds will be released to the Contractor as items are completed and verified on the Punch List.
3. THE RETAINAGE WILL NOT BE RELEASED UNTIL CERTIFICATE OF OCCUPANCY FROM THE AHJ HAS BEEN SUBMITTED TO THE ARCHITECT.
4. THE RETAINAGE WILL NOT BE RELEASED UNTIL THE PROJECT CLOSEOUT IS COMPLETE.

F. Final adjustment of accounts

1. Submit a final statement of accounting to the Architect, showing all adjustments to the Contract Sum.
2. If so required, the Architect will prepare a final Change Order showing adjustments to the Contract Sum which were not made previously by Change Orders.

**FINAL ACCEPTANCE CHECKLIST**

DATE: \_\_\_\_\_

PROJECT NAME: \_\_\_\_\_

OWNER'S NAME: \_\_\_\_\_

COMPLETED BY: \_\_\_\_\_

TO: \_\_\_\_\_

COPY TO: \_\_\_\_\_

**THE FOLLOWING CHECKLIST IS COMPLETED AND THEREFORE THE PROJECT IS READY FOR FINAL PAYMENT AS OUTLINED IN THE CONTRACT DOCUMENTS.**

Received Final Payment Request and Release of Claims.			
Final Change Order Completed and Signed By All.			
Contractor's Affidavit of Payment of Debts and Claims.			
Consent of Surety To Final Payment.			
All Operation & Maintenance Manuals Received.			
Final Record Drawings Received.			
All Guarantees and Warranties Received.			
Punchlist Fully Cleared (Attached Copy).			
Air Quality and Commissioning Completed and All Items Addressed and Corrected.			
Written Acknowledgement of Lead and Asbestos Free.			
All Attic Stock Delivered to Owner.			
Certificate of Occupancy Obtained From AHJ			

**EXPLANATION OF ANY OUTSTANDING ISSUES OR DEFICIENCIES:** \_\_\_\_\_

**HEREBY SUBMITTED FOR REVIEW:**

**SIGNED:** \_\_\_\_\_

**DATE:** \_\_\_\_\_

### **3.17 MAINTENANCE**

- A. Provide service and maintenance of components indicated in specification sections.
- B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.
  - 1. Review warranty request procedures with the Architect and Owner no less than two weeks prior to Date of Substantial Completion.
  - 2. All work performed and completed during the Contractor's one year warranty period shall be noted as complete and signed off on accordingly on a warranty request form as agreed upon by Owner and Architect. The form will be provided to the Contractor for each item requested for maintenance or repair and is required to be returned, once the work is complete, in the same originally sent document format with cause and corrective action described in detail. All work during the Contractor's one year warranty period shall be communicated by the Contractor to both the Owner and Architect.
  - 3. Contractor shall maintain a complete and accurate schedule of the dates of Substantial Completion, dates upon which the one year warranty on each phase or building which is substantially complete will expire, and dates of Final Completion. Contractor agrees to provide notice of the warranty expiration date to Owner and Architect at least one month prior to the expiration of the one year warranty period on each building or each phase of the building, which has been substantially completed. Prior to termination of the one year warranty period, Contractor shall accompany the Owner and Architect on review of the building and be responsible for correcting any reasonable deficiencies not caused by the Owner or by the use of the building which are observed or reported during the review. For extended warranties required by various sections, i.e. roofing, compressors, mechanical equipment, Owner will notify the Contractor of deficiencies and Contractor shall start remedying these defects within three (3) days of initial notification from Owner. Contractor shall prosecute the work without interruption until accepted by the Owner and the Architect, even though such prosecution should extend beyond the limit of the warranty period.
- C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

#### **END OF SECTION**





**SECTION 01 7800  
CLOSEOUT SUBMITTALS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Procedures for digital project records.
- B. Project Record Documents.
- C. Operation and Maintenance Data.
- D. Closeout Documents.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- B. Section 01 7000 - Execution and Closeout Requirements: Contract closeout procedures.
- C. Section 01 7900 - Demonstration and Training: Training requirements.
- D. Individual Product Sections: Specific requirements for operation and maintenance data.
- E. Individual Product Sections: Warranties required for specific products or Work.
- F. Individual Product Sections: Specific requirements for demonstration and training.

**1.03 SUBMITTALS**

- A. Submittal Procedure
  - 1. Within sixty (60) days following the Notice to Proceed, the Contractor shall submit a list of Expected Closeout Documents for review by the Architect. This list shall include project record documents, operation and maintenance data, warranties, bonds, contract forms, health/safe environment data, attic stock sign offs, Owner training, certifications and inspections, and other types as indicated. All items on the list shall be titled with spec section number and general description - Example: "09 3000 Tiling - 1 year warranty".
  - 2. The Architect will review the list of Expected Closeout Documents, provide revision comments and return it to the Contractor within fourteen (14) business days. If revisions are required, the Contractor shall then resubmit a revised list to the Architect and Owner within fourteen (14) business days and thereafter until approved.
  - 3. Contractor may submit Closeout Documents by Specification Division in full as scopes of work are completed.
  - 4. Within sixty (60) calendar days of substantial completion, Contractor shall submit closeout submittals as required in accordance with this section and secure Architect's approval.
  - 5. Contractor shall provide cover page with space for Contractor and Architect review stamps for each submission.
  - 6. The Architect's approval of the current status of Project Record Documents may be a prerequisite to the Architect's approval of requests for progress payment and request for final payment under the Contract.
  - 7. Prior to submitting each request for progress payment, secure the Architect's approval of the current status of the Project Record Documents.
  - 8. Prior to submitting request for final payment, Contractor shall submit the final Project Record Documents to the Architect and secure approval.
  - 9. Contractor shall submit a complete set of closeout documents for each project where multiple projects are combined under a single proposal package.
  - 10. Review and Final Submission of Closeout Submittals
    - a. Participate in review meetings as required.
    - b. Documents shall be reviewed and verified by contractor prior to submission to the Architect.
    - c. Review submittal with Owner and Architect prior to final submittal for review and electronic archiving.

- d. Number shall be Architects project number followed by the appropriate specification section - consecutive submittal number for section.  
( Example - 1234-01-01 Tiling 09 3000 - 5)  
When material is re-submitted for any reason, transmit under a new letter of transmittal and with a new transmittal number. On re-submittals, cite the original submittal number for reference.
  - e. Contractor shall allow 14 days from date of submission for Preliminary Architectural Review excluding delivery time to and from the Contractor.
  - f. The contractor shall be responsible for delays caused by rejection of inadequate or incorrect submittals.
  - g. Submittals received by Architect without General Contractor's stamp will be rejected.
  - h. Make changes required from the Preliminary Architectural Review and deliver the Final Project Record Documents to and secure approval from the Architect. When revised for resubmission, identify all changes made since previous submission.
  - i. Contractor will pay all associated cost in preparing close-out documents.
11. Closeout Submittals Requirements.
- a. Closeout and Record Documents as required by this section shall be provided to the Owner upon completion of the project. Submit the number as outlined below:
    - 1) Project Record Documents - Drawings and Project Manual
      - (a) One (1) copy on USB Flash Drive
    - 2) Closeout Documents – Including Operation and Maintenance Manuals
      - (a) One (1) copy on USB Flash Drive
  - b. Electronic Submittal Format.
    - 1) The digital file shall be set up using a non-proprietary “PDF” format.
    - 2) All data shall be indexed/book marked and hyperlinked to associated data.
    - 3) Data shall be searchable by key word. All data shall allow printing of material.
    - 4) Electronic submittal shall follow the format shown in Part 3.
    - 5) Under paragraph 3.05 Assembly of Operations and Maintenance Manuals, all items shall be organized as specified.
  - c. Training Session Submittal Format.
    - 1) Refer to Section 01 7900 - Demonstration and Training.
- B. Project Record Documents: Submit documents to and secure approval from Architect prior to request for final Application for Payment.

## **PART 2 PRODUCTS - NOT USED**

## **PART 3 EXECUTION**

### **3.01 PROJECT RECORD DOCUMENTS**

- A. All record documents shall be maintained on site in digital format; record actual revisions to the Work, including but no limited to:
  - 1. Drawings.
  - 2. Specifications.
  - 3. Addenda.
  - 4. RFIs.
  - 5. Change Orders and other modifications to the Contract.
  - 6. Reviewed shop drawings, product data, and samples.
  - 7. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Contractor shall maintain and protect the record documents with backups and/or any other means necessary to ensure the integrity of the digital files.
- D. In the event of loss of recorded data, use means necessary to again secure the data to the Architect's approval.

1. Such means shall include, if necessary in the opinion of the Architect, removal and replacement of concealing materials.
2. In such case, provide replacements to the standards originally required by the Contract Documents.
- E. Record information concurrent with construction progress. Record Documents shall be current and submitted with each pay application.
- F. Specifications: Record at each product section description of actual products installed, including the following:
  1. Manufacturer's name and product model and number.
  2. Product substitutions or alternates utilized.
  3. Changes made by Addenda and modifications.
- G. Record Drawings and Shop Drawings: Mark each item to record actual construction including:
  1. On the cover sheet of the Project Manual and the Drawings, provide the following statement, "RECORD DOCUMENTS- The changes noted herein are indicated in color and are designated by a revision delta (RD). The changes are recorded by [Contractor Name], [Date]."
  2. Prior to construction, insert all addenda to the record documents, both drawings and specifications as modified.
  3. Making entries on Drawings.
    - a. Using colored markings, clearly describe the change by graphic line and note as required.
    - b. Date all entries.
    - c. Call attention to the entry by a "cloud" drawn around the area or areas affected. Add delta triangle with the letters "RD" inside the triangle.
    - d. In the event of overlapping changes, use different colors for the overlapping changes.
  4. In addition to field changes, mark the record documents with areas modified by RFIs and change orders and hyperlink to the corresponding data.
  5. Schematic layouts.
    - a. In some cases on the Drawings, arrangements of conduits, circuits, piping, ducts, and similar items, are shown schematically and is not intended to portray precise physical layout.
    - b. Clearly identify the item by accurate note such as "cast iron drain," "copper water", and the like.
      - 1) Show, by symbol or note, the vertical location of the item ("under slab", "in ceiling plenum," "exposed," and the like).
      - 2) Make all identification sufficiently descriptive that it may be related reliably to the Specifications.
  6. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  7. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
  8. Field changes of dimension and detail.
  9. Details not on original Contract drawings.

### **3.02 OPERATION AND MAINTENANCE DATA**

- A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

- D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

### **3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES**

- A. For Each Product, Applied Material, and Finish:
1. Product data, with catalog number, size, composition, and color and texture designations.
  2. Information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. Additional information as specified in individual product specification sections.
- E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

### **3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS**

- A. Refer to Divisions 21, 22, 23, 26, 27 and 28 for system requirements.

### **3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS**

- A. Assemble operation and maintenance data into organized file folders for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.
- B. Where systems involve more than one specification section, provide separate folder for each system.
- C. Cover: Identify each USB Flash Drive with the title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- D. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties organized by division with project scopes listed for each company.
- E. Tables of Contents: List every item using the same identification as on the content section and hyperlinked accordingly; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.
- F. Contents: Prepare final project record closeout documents for delivery to Owner in PDF file format as follows:
1. FILE FOLDER: XXXX-XX OWNER'S NAME - PROJECT NAME - CLOSEOUT SUBMITTAL
    - a. FILE FOLDER: 01 Table of Contents
      - 1) PDF File: Table of Contents
    - b. FILE FOLDER: 02 Project Directory
      - 1) PDF File: Project Directory (organized as below):
        - (a) Design Team
        - (b) General Contractor
        - (c) Sub-Contractors and Principal Vendors (organized by Division with project scope(s) listed for each Company)
    - c. FILE FOLDER: 03 Contract Forms (organized and titled as below):
      - 1) PDF FILE: Substantial Completion, AIA G704
      - 2) PDF FILE: Payment and Performance Bond
      - 3) PDF FILE: Certificates of Liability Insurance
      - 4) PDF FILE: Contractor's Affidavit of Payment of Debts and Claims, AIA G706
      - 5) PDF FILE: Contractor's Affidavit of Release of Liens, AIA G706A

- 6) PDF FILE: Consent of Surety to Final Payment, AIA G707
- 7) PDF FILE: Contractor and Sub-contractors' Release or Waiver of Liens
- 8) FILE FOLDER: Change Orders
  - (a) PDF FILES: (separate files for each Change Order, organized and titled in numerical order)
- d. FILE FOLDER: 04 Certifications and Inspections (organized and titled as below):
  - 1) PDF FILE: The correspondence from the Geotechnical Engineer, required by Section 01 1400 at the beginning of construction, indicating that the Construction Documents conform with their recommendations.
  - 2) PDF FILE: The correspondence from the Special Inspection and Testing Agency (SITA), required by Section 01 1400 at the beginning of construction, indicating that the SITA accepted the responsibility to perform the specified SITA scope and meet the specified SITA qualifications
  - 3) PDF FILE: The correspondence from the Commissioning Agent (CxA), required by Section 01 1400 at the beginning of construction, indicating that the CxA accepted the responsibility to perform the specified SITA scope and meet the specified SITA qualifications
  - 4) PDF FILE: The "Acknowledgement of Contractor's Responsibilities Related to Code-Required Quality Control" required by Section 01 4533 at the beginning of construction.
  - 5) PDF FILE: A copy of the written correspondence from the Contractor to the AHJ submitting the "Final Reports of Quality Control" required by Section 01 4533 from the SITA, CxA, and Code-Required Structural Observer. The copy of this correspondence shall include the actual reports and not just be a cover letter.
  - 6) PDF FILE: The "Final Report of Quality Control" required by Section 01 4533 from the SITA
  - 7) PDF FILE: The "Final Report of Quality Control" required by Section 01 4533 from the CxA
  - 8) PDF FILE: The "Final Report of Quality Control" required by Section 01 4533 from the Code-Required Structural Observer
  - 9) PDF FILE: The "Final Report of Quality Control" required by Section 01 4533 from the Structural Engineer
  - 10) PDF FILE: The "Final Report of Quality Control" required by Section 01 4533 from the Mechanical Engineer
  - 11) PDF FILE: The "Final Report of Quality Control" required by Section 01 4533 from the Electrical Engineer
  - 12) PDF FILE: Certificates of Occupancy
  - 13) PDF FILE: TEA Certificate of Project Compliance. File may be downloaded at [https://tea.texas.gov/sites/default/files/cert\\_pre2004.pdf](https://tea.texas.gov/sites/default/files/cert_pre2004.pdf). Sample form is attached following this Section.
  - 14) PDF FILE: Final Fire Inspection
  - 15) PDF FILE: Final Health Inspection
  - 16) PDF FILE: Final Elevator Inspection
  - 17) PDF FILE: Final Building Inspection
  - 18) PDF FILE: Accessibility Review Report
  - 19) PDF FILE: Energy Code Compliance Letter
  - 20) PDF FILE: HVAC Test and Balance Reports
  - 21) PDF FILE: Backflow Test Report
  - 22) PDF FILE: Data Testing Results
  - 23) FLW FILE: Data Testing Results (Native)
- e. FILE FOLDER: 05 Health/Safe Environment Data (organized and titled as below):
  - 1) PDF FILE: Asbestos-, Lead- and Hazardous-Free Material Certificates or Letter
  - 2) PDF FILE: Material Safety Data Sheets (MSDS) (organized by Division)
  - 3) PDF FILE: Indoor Air Quality Test Reports

- f. FILE FOLDER: 06 Additional Project Information
  - 1) FILE FOLDER: Requests for Information
    - (a) PDF FILES (separate files for each RFI, organized and titled in numerical order)
  - 2) FILE FOLDER: Requests for Proposals
    - (a) PDF FILES (separate files for each RFP, organized and titled in numerical order)
  - 3) FILE FOLDER: Approved Submittals
    - (a) PDF FILES (separate files for each Submittal, organized and titled in numerical order by specification section)
- g. FILE FOLDER: 07 Attic Stock
  - 1) PDF FILES: Attic Stock Sign-Off Sheets (separate files for each, showing Owner receipt, and organized and titled in numerical order by Specification Section)
- h. FILE FOLDER: 08 Demonstration and Training
  - 1) FILE FOLDER: Sign-In Sheets
    - (a) PDF FILES: (separate files for each, organized and titled in numerical order by Specification Section)
  - 2) FILE FOLDER: Training Videos
    - (a) All training videos organized and titled in numerical order by Specification Section
- i. FILE FOLDER: 09 Project Record Documents
  - 1) PDF FILE: Project Record Specifications Manual (organized and bookmarked by Division and by Specification Section) - include and hyperlink all Addenda, RFIs, RFPs, and In-Field Changes stamped as "As-Built" or "Record Documents".
  - 2) PDF FILE: Project Record As-Built Drawings (organized and bookmarked by Sheet Number) - include and hyperlink all Addenda, RFIs, RFPs, and In-Field Changes stamped as "As-Built" or "Record Documents".
- j. FILE FOLDER: 10 Warranties
  - 1) FILE FOLDERS: (separate file folders, organized and titled by Division)
    - (a) PDF FILES: (all warranty PDF files organized under each Division file folder and titled by Company Name)
    - (b) PDF FILE: List of all warranties extending past one year. Include company name and contact information.
- k. FILE FOLDER: 11 Operation and Maintenance Manuals
  - 1) PDF FILE: Keying Schedule
  - 2) PDF FILE: Shop Drawings (separate files for each, organized and titled by Specification Section)
  - 3) FILE FOLDER: Manuals
    - (a) FILE FOLDERS: (separate file folders, organized and titled by Division)
    - (b) PDF FILES: (all Manuals PDF files organized under each Division file folder and titled by Specification Section and scope)

### **3.06 CHANGES SUBSEQUENT TO ACCEPTANCE**

- A. The Contractor has no responsibility for recording changes in the Work subsequent to Final Completion, except for changes resulting from work performed under Warranty.

### 3.07 CERTIFICATION OF PROJECT COMPLIANCE

<b>CERTIFICATION OF PROJECT COMPLIANCE</b>	Completion of this form is required under provisions of 61.1036(c)(3)(F) TAC for all public school district construction projects.
--	--

**1. PROJECT INFORMATION** DISTRICT: \_\_\_\_\_

Facility: \_\_\_\_\_

ARCHITECT/ENGINEER: \_\_\_\_\_

Address: \_\_\_\_\_

CONTRACTOR/CM: \_\_\_\_\_

City: \_\_\_\_\_

CONTRACT DATE: \_\_\_\_\_

<b>DATE DISTRICT AUTHORIZED PROJECT:</b> _____
--

**BRIEF DESCRIPTION OF PROJECT:** \_\_\_\_\_

### 2. CERTIFICATION OF DESIGN AND CONSTRUCTION

The intent of this document is to assure that the school district has provided to the architect/engineer the required information and the architect/engineer has reviewed the School Facilities Standards as required by the State of Texas, and used his/her reasonable professional judgment and care in the architectural/engineering design and that the contractor has constructed the project in a quality manner in general conformance with the design requirements and that the school district certifies to project completion. \_\_\_\_\_.

**3. The District** certifies that the educational program and educational specifications of this facility along with the identified building code to be used have been provided to the architect/engineer.

**DISTRICT:** \_\_\_\_\_ **BY:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

**4. The Architect/Engineer** certifies the above information was received from the school district, and that the building(s) were designed in accordance with the applicable building codes. Further, the facility has been designed to meet or exceed the design criteria relating to space (minimum square footage), educational adequacy, and construction quality as contained in the School Facilities Standards as adopted by the Commissioner of Education, July 9, 2003, and as provided by the district.

**ARCHITECT/ENGINEER:** \_\_\_\_\_ **BY:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

**5. The Contractor** certifies that this project has been constructed in general conformance with the construction documents as prepared by the architect/engineer listed above.

**CONTRACTOR/CM:** \_\_\_\_\_ **BY:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

**6. The District** certifies completion of the project (as defined by the architect/engineer and contractor).

**DISTRICT:** \_\_\_\_\_ **BY:** \_\_\_\_\_ **DATE:** \_\_\_\_\_





**SECTION 01 7900  
DEMONSTRATION AND TRAINING**

**PART 1 GENERAL**

**1.01 SUMMARY**

- A. Demonstration of products and systems to be commissioned and requiring routine maintenance where indicated in specific specification sections.
- B. Training of Owner personnel in operation and maintenance is required for:
  - 1. All software-operated systems.
  - 2. HVAC systems and equipment.
  - 3. Plumbing equipment.
  - 4. Electrical systems and equipment.
  - 5. Conveying systems.
  - 6. Landscape irrigation.
  - 7. Audio and Visual systems.
  - 8. Lighting systems.
  - 9. Security systems and Access Controls.
  - 10. Fire Alarm systems.
  - 11. Kitchen Equipment.
  - 12. Resinous Flooring
  - 13. Items specified in individual product Sections.
- C. Training of Owner personnel in care, cleaning, maintenance, and repair is required for:
  - 1. Roofing, waterproofing, and other weather-exposed or moisture protection products.
  - 2. Finishes, including flooring, wall finishes, ceiling finishes.
  - 3. Fixtures and fittings.
  - 4. Items specified in individual product Sections.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 7800 - Closeout Submittals: Operation and maintenance manuals.
- B. Other Specification Sections: Additional requirements for demonstration and training.

**1.03 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures; except:
  - 1. Make all submittals specified in this section, and elsewhere where indicated for commissioning purposes, directly to the Architect and Tomball, ISD.
  - 2. Submittals indicated as "Draft" are intended for the use of Owner in preparation of overall Training Plan; submit in editable electronic format, latest version of Microsoft Word required.
- B. Draft Training Plans: Owner will designate personnel to be trained; tailor training to needs and skill-level of attendees.
  - 1. Submit not less than four weeks prior to start of training.
  - 2. Revise and resubmit until acceptable.
  - 3. Provide an overall schedule showing all training sessions.
  - 4. Include at least the following for each training session:
    - a. Identification, date, time, and duration.
    - b. Description of products and/or systems to be covered.
    - c. Name of firm and person conducting training; include qualifications.
    - d. Intended audience, such as job description.
    - e. Objectives of training and suggested methods of ensuring adequate training.
    - f. Methods to be used, such as classroom lecture, live demonstrations, hands-on, etc.
    - g. Media to be used, such as slides, hand-outs, etc.

- h. Training equipment required, such as projector, projection screen, etc., to be provided by Contractor.
- C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.
  - 1. Include applicable portion of O&M manuals.
  - 2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.
  - 3. Provide one extra copy of each training manual to be included with operation and maintenance data.
- D. Training Reports:
  - 1. Identification of each training session, date, time, and duration.
  - 2. Sign-in sheet showing names and job titles of attendees.
  - 3. List of attendee questions and written answers given, including copies of and references to supporting documentation required for clarification; include answers to questions that could not be answered in original training session.
  - 4. Include Tomball, ISD's formal acceptance of training session.
- E. Video Recordings: Submit digital video recording of each demonstration and training session for Owner's subsequent use.
  - 1. Format: DVD Disc.
  - 2. Label each disc and container with session identification and date.
  - 3. Provide sign-off sheets in the closeout documents indicating the individuals who were in attendance at each of the training sessions.

#### **1.04 QUALITY ASSURANCE**

- A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
  - 1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
  - 2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

#### **PART 2 PRODUCTS - NOT USED**

#### **PART 3 EXECUTION**

##### **3.01 DEMONSTRATION - GENERAL**

- A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by Owner.
- B. Demonstrations conducted during Functional Testing need not be repeated unless Owner personnel training is specified.
- C. Demonstration may be combined with Owner personnel training if applicable.
- D. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.
  - 1. Perform demonstrations not less than two weeks prior to Substantial Completion.
  - 2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- E. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
  - 1. Perform demonstrations not less than two weeks prior to Substantial Completion.

##### **3.02 TRAINING - GENERAL**

- A. Conduct training on-site unless otherwise indicated.
- B. Owner will provide classroom and seating at no cost to Contractor.

- C. Do not start training until Functional Testing is complete, unless otherwise specified or approved by the Tomball, ISD.
- D. Provide training in minimum two hour segments.
- E. The Tomball, ISD is responsible for determining that the training was satisfactorily completed.
- F. Training schedule will be subject to availability of Owner's personnel to be trained; re-schedule training sessions as required by Owner; once schedule has been approved by Owner failure to conduct sessions according to schedule will be cause for Owner to charge Contractor for personnel "show-up" time.
- G. Review of Facility Policy on Operation and Maintenance Data: During training discuss:
  - 1. The location of the O&M manuals and procedures for use and preservation; backup copies.
  - 2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
  - 3. Typical uses of the O&M manuals.
- H. Product- and System-Specific Training:
  - 1. Review the applicable O&M manuals.
  - 2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
  - 3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
  - 4. Provide hands-on training on all operational modes possible and preventive maintenance.
  - 5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
  - 6. Discuss common troubleshooting problems and solutions.
  - 7. Discuss any peculiarities of equipment installation or operation.
  - 8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
  - 9. Review recommended tools and spare parts inventory suggestions of manufacturers.
  - 10. Review spare parts and tools required to be furnished by Contractor.
  - 11. Review spare parts suppliers and sources and procurement procedures.
- I. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.
- J. Contractor must have written approval from the Owner and Architect to forgo any required trainings.

**END OF SECTION**



**SECTION 02 4119**  
**SELECTIVE DEMOLITION**

**PART 1 - GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 SUMMARY**

- A. Section Includes:
  - 1. Demolition and removal of selected portions of building or structure.
  - 2. Demolition and removal of selected site elements.
  - 3. Salvage of existing items to be reused or recycled.
- B. Related Requirements:
  - 1. Section 015639 "Temporary Tree and Plant Protection" for temporary protection of existing trees and plants that are affected by selective demolition.
  - 2. Section 311000 "Site Clearing" for site clearing and removal of above- and below-grade improvements.

**1.03 DEFINITIONS**

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

**1.04 MATERIALS OWNERSHIP**

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
  - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

**1.05 PREINSTALLATION MEETINGS**

- A. Pre-demolition Conference: Conduct conference at Project site.
  - 1. Inspect and discuss condition of construction to be selectively demolished.
  - 2. Review structural load limitations of existing structure.
  - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
  - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
  - 5. Review areas where existing construction is to remain and requires protection.
  - 6. If needed, insert list of conference participants not mentioned in Section 013100 "Project Management and Coordination."

**1.06 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For refrigerant recovery technician.
- B. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.
- C. Schedule of Selective Demolition Activities: Indicate the following:
  - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's building manager's and other tenants' on-site operations are uninterrupted.
  - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
  - 3. Coordination for shutoff, capping, and continuation of utility services.
  - 4. Use of elevator and stairs.
  - 5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- D. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.
- E. Pre-demolition Photographs or Video: Submit before Work begins.
- F. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.
- G. Warranties: Documentation indicated that existing warranties are still in effect after completion of selective demolition.

**1.07 CLOSEOUT SUBMITTALS**

- A. Inventory: Submit a list of items that have been removed and salvaged.
- B. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

**1.08 QUALITY ASSURANCE**

- A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

**1.09 FIELD CONDITIONS**

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
  - 1. Hazardous materials will be removed by Owner before start of the Work.
  - 2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

- E. Hazardous Materials: Hazardous materials are present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
  - 1. Hazardous material remediation is specified elsewhere in the Contract Documents.
  - 2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
  - 3. Retain subparagraph below if hazardous materials are known to be present. Delete if Owner does not have, or will not provide, material safety data sheets for these materials.
  - 4. Owner will provide material safety data sheets for suspected hazardous materials that are known to be present in buildings and structures to be selectively demolished because of building operations or processes performed there.
- F. Historic Areas: Demolition and hauling equipment and other materials shall be of sizes that clear surfaces within historic spaces, areas, rooms, and openings, including temporary protection, by 12 inches or more.
- G. Storage or sale of removed items or materials on-site is not permitted.
- H. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
  - 1. Maintain fire-protection facilities in service during selective demolition operations.

#### **1.10 WARRANTY**

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties. Notify warrantor before proceeding.
- B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

### **PART 2 - PRODUCTS**

#### **2.01 PERFORMANCE REQUIREMENTS**

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

### **PART 3 - EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.
- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- E. Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned

collapse of any portion of structure or adjacent structures during selective building demolition operations.

1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
  2. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.
- F. Survey of Existing Conditions: Record existing conditions by use of measured drawings and preconstruction photographs.
1. Comply with requirements specified in Section 013233 "Photographic Documentation."
  2. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
  3. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

### **3.02 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS**

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
1. Comply with requirements for existing services/systems interruptions specified in Section 011000 "Summary."
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
  2. Arrange to shut off indicated utilities with utility companies.
  3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
  4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.
    - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
    - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
    - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
    - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
    - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
    - g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.
- C. Refrigerant: Remove refrigerant from mechanical equipment to be selectively demolished according to 40 CFR 82 and regulations of authorities having jurisdiction.



### **3.03 PREPARATION**

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  - 1. Comply with requirements for access and protection specified in Section 015000 "Temporary Facilities and Controls."
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
  - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
  - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
  - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
  - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
  - 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
  - 1. Strengthen or add new supports when required during progress of selective demolition.

### **3.04 SELECTIVE DEMOLITION, GENERAL**

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
  - 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
  - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
  - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  - 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
  - 5. Maintain adequate ventilation when using cutting torches.
  - 6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
  - 7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
9. Dispose of demolished items and materials promptly comply with requirements in Section 017419 "Construction Waste Management and Disposal."
- B. Work in Historic Areas: Selective demolition may be performed only in areas of the Project that are not designated as historic. In historic spaces, areas, and rooms or on historic surfaces, the terms "demolish" or "remove" shall mean historic "removal" or "dismantling" as specified in Section 013591 "Historic Treatment Procedures."
- C. Removed and Salvaged Items:
  1. Clean salvaged items.
  2. Pack or crate items after cleaning. Identify contents of containers.
  3. Store items in a secure area until delivery to Owner.
  4. Transport items to Owner's storage area designated by Owner.
  5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
  1. Clean and repair items to functional condition adequate for intended reuse.
  2. Pack or crate items after cleaning and repairing. Identify contents of containers.
  3. Protect items from damage during transport and storage.
  4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

### **3.05 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS**

- A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.
- B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, then remove concrete between saw cuts.
- C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.
- D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.
- E. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings. Do not use methods requiring solvent-based adhesive strippers.
- F. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight.
  1. Remove existing roof membrane, flashings, copings, and roof accessories.
  2. Remove existing roofing system down to substrate.

**3.06 DISPOSAL OF DEMOLISHED MATERIALS**

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
  - 1. Do not allow demolished materials to accumulate on-site.
  - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
  - 3. Coordinate first subparagraph below with use of elevators, stairs, or building entries permitted by building manager.
  - 4. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
  - 5. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.
- C. Burning: Burning of demolished materials will be permitted only at designated areas on Owner's property, provided required permits are obtained. Provide full-time monitoring for burning materials until fires are extinguished.
- D. Disposal: Transport demolished materials and dispose of at designated spoil areas on Owner's property.
- E. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

**3.07 CLEANING**

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

**3.08 SELECTIVE DEMOLITION SCHEDULE**

- A. Existing Items to Be Removed: See construction drawings.
- B. Existing Items to Be Removed and Salvaged: See construction drawings.
- C. Existing Items to Be Removed and Reinstalled: See construction drawings.
- D. "Existing Items to Remain" Paragraph below may be used to inform Contractor of items that are to remain, such as those that occur in, or are adjacent to, construction being demolished, but are not being removed and reinstalled. Retain paragraph if required.
- E. Existing Items to Remain: See construction drawings.

**END OF SECTION**



**SECTION 03 1000  
CONCRETE FORMING AND ACCESSORIES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Formwork for cast-in place concrete.
- B. Form accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 2000 - Concrete Reinforcing.
- B. Section 03 3000 - Cast-in-Place Concrete.

**1.03 REFERENCE STANDARDS**

- A. ACI 117 - Specification for Tolerances for Concrete Construction and Materials 2010 (Reapproved 2015).
- B. ACI 301 - Specifications for Concrete Construction 2020.
- C. ACI 318 - Building Code Requirements for Structural Concrete 2019 (Reapproved 2022).
- D. ACI 347R - Guide to Formwork for Concrete 2014 (Reapproved 2021).
- E. PS 1 - Structural Plywood 2019.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on void form materials and installation requirements.
- C. Shop Drawings: Indicate pertinent dimensions, materials, bracing, arrangement of joints and ties, and minimum soil retainer bearing lengths above the bottom of the grade beam and below the bottom of the void as calculated per the formwork accessories section below.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver prefabricated forms and installation instructions in manufacturer's packaging.
- B. Store prefabricated forms off ground in ventilated and protected manner to prevent deterioration from moisture.
- C. Protect plastic foam products from damage and exposure to sunlight.

**PART 2 PRODUCTS**

**2.01 FORMWORK - GENERAL**

- A. Provide concrete forms, accessories, shoring, and bracing as required to accomplish cast-in-place concrete work.
- B. Design and construct concrete that complies with design with respect to shape, lines, and dimensions.
- C. Comply with relevant portions of ACI 301, ACI 301, and ACI 301.

**2.02 WOOD FORM MATERIALS**

- A. Wood forms for unexposed concrete surfaces - No. 2 Common Southern Yellow Pine Lumber or other material of equal qualifications of sufficient thickness to be capable of sustaining the loads to be imposed thereon, dressed to uniformly smooth contact surfaces.
- B. Wood forms for exposed concrete surfaces - Commercial Standard Douglas Fir, moisture-resistant, concrete form plywood with one smooth face.

## **2.03 FORMWORK ACCESSORIES**

- A. Form Release Agent: Capable of releasing forms from hardened concrete without staining or discoloring concrete or forming bugholes and other surface defects, compatible with concrete and form materials, and not requiring removal for satisfactory bonding of coatings to be applied.
  - 1. Composition: Colorless mineral oil-based compound.
- B. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.
- C. Joint Filler: Nonextruding, resilient asphalt impregnated fiberboard or felt, complying with ASTM D 1751, 1/2 inch thick and full depth of slab less 1/2 inch .
- D. Waterstops: See section 03 3000 - Cast-in-Place Concrete.
- E. Expanded Polystyrene (EPS) Geofoam:
  - 1. Lightweight expanded polystyrene with a minimum compressive strength of 2.2 pounds per square inch (psi) at a 1% deformation.
  - 2. Geofoam shall be in compliance with ASTM D 6817.
  - 3. Geofoam shall be shaped to provide continuous support for raised slabs or to act as a lightweight fill material at locations indicated on the drawings.
  - 4. Manufacturers:
    - a. Foam-Control EPS Geofoam, AFM Corporation: [www.geofoam.com](http://www.geofoam.com)
    - b. InsulFoam GF, Insulfoam, LLC.: [www.insulfoam.com](http://www.insulfoam.com)
    - c. Therma Foam: [www.thermafoam.com](http://www.thermafoam.com)

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

### **3.02 EARTH FORMS**

- A. Earth formed grade beams allowed only where noted in the Structural Drawings. Grade beams shall be FORMED ON ALL structural slabs and exposed conditions. Hand trim sides and bottom of earth forms. Remove loose soil prior to placing concrete.

### **3.03 ERECTION - FORMWORK**

- A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301.
- B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.
- C. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.
- D. Refer to the Civil Drawings for construction joint requirements at flatwork.
- E. Construction joints: Locate construction joints in concrete as indicated. Contractor shall obtain written approval for all construction joints not shown on Drawings for structural concrete. Distance between construction joints shall be arranged so that the greatest horizontal dimension (including diagonal measurement) for slab pours shall not exceed 200 feet. Provide keyways and extra dowels at all joints. Provide longitudinal keys at joints.
- F. Expansion joints: Expansion joints shall consist of joint fillers with sealant. Install filler strips 3/4" below finished surfaces. Clean grooves when surface is dry of foreign matter, loose particles and concrete protrusions; then fill approximately flush with joint sealant to be slightly concave after drying. Finish edges of exposed concrete along expansion joints around all fixed objects within or abutting concrete.
- G. If formwork is placed after reinforcement, resulting in insufficient concrete cover over reinforcement, request instructions from Architect/Engineer before proceeding.

#### **3.04 APPLICATION - FORM RELEASE AGENT**

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations.
- B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
- C. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

#### **3.05 FORMWORK TOLERANCES**

- A. Construct formwork to maintain tolerances required by ACI 117, unless otherwise indicated.
- B. Construct and align formwork for elevator hoistway in accordance with ASME A17.1.

#### **3.06 FIELD QUALITY CONTROL**

- A. A special inspections and testing agency (SITA) will perform field quality control tests and inspections, as specified in Sections 01 4516 and 01 4533.
- B. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and to verify that supports, fastenings, wedges, ties, and items are secure.
- C. Do not reuse wood formwork more than 2 times for concrete surfaces to be exposed to view. Do not patch formwork.

#### **3.07 FORM REMOVAL**

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
- B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
- C. Store removed forms to prevent damage to form materials or to fresh concrete. Discard damaged forms.

**END OF SECTION**





**SECTION 03 2000  
CONCRETE REINFORCING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Reinforcing steel for cast-in-place concrete.
- B. Supports and accessories for steel reinforcement.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 1000 - Concrete Forming and Accessories.
- B. Section 03 3000 - Cast-in-Place Concrete.

**1.03 REFERENCE STANDARDS**

- A. ACI 301 - Specifications for Concrete Construction 2020.
- B. ACI 318 - Building Code Requirements for Structural Concrete 2019 (Reapproved 2022).
- C. ACI SP-66 - ACI Detailing Manual 2004.
- D. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement 2022.
- E. ASTM A706/A706M - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement 2022a.
- F. CRSI (DA4) - Manual of Standard Practice 2018, with Errata (2019).
- G. CRSI (P1) - Placing Reinforcing Bars, 10th Edition 2019.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Comply with requirements of ACI SP-66. Include bar schedules, shapes of bent bars, spacing of bars, location of splices and embedded metal assemblies.
- C. Manufacturer's Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.
- D. Reports: Submit certified copies of mill test report of reinforcement materials analysis.

**1.05 QUALITY ASSURANCE**

- A. Perform work of this section in accordance with ACI 318, ACI 318, ACI 301, ACI 318, and ACI 318.
  - 1. Maintain one copy of each document on project site.
- B. Provide Architect with access to fabrication plant to facilitate inspection of reinforcement. Provide notification of commencement and duration of shop fabrication in sufficient time to allow inspection.
- C. Welders' Certificates: Submit certifications for welders employed on the project, verifying AWS qualification within the previous 12 months.

**PART 2 PRODUCTS**

**2.01 REINFORCEMENT**

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
  - 1. Deformed billet-steel bars.
  - 2. Unfinished.
  - 3. Splicing of pier reinforcement shall not be permitted.
- B. Weldable Reinforcing Steel: ASTM A 706, deformed low-alloy steel bars.
  - 1. Unfinished.
- C. Steel Welded Wire Reinforcement (WWR): Plain Type; 1.

1. Form: Flat Sheets.
- D. Reinforcement Accessories:
  1. Tie Wire: Annealed, minimum 16 gage, 0.0508 inch.
  2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement. At slabs, supports shall not be further than 48 inches apart, each way.
  3. Provide plastic or plastic coated steel components for placement within 1-1/2 inches of weathering surfaces.

## **2.02 FABRICATION**

- A. Fabricate concrete reinforcing in accordance with ACI SP-66 - ACI Detailing Manual.
- B. Welding of reinforcement is not permitted, unless explicitly indicated on Structural Drawings
- C. Locate reinforcing splices not indicated on drawings at point of minimum stress.
  1. Review locations of splices with Architect.
  2. Approved patented type splices (No Electric Arc Welding Permitted) may be used instead of lap splices.
  3. Any bar may be field bent one time without notifying the Structural Engineer, unless noted otherwise on the Structural Drawings. Reinforcement smaller than #4 bars shall be cold bent. Reinforcement greater than #4 bars shall be bent with heat in the field. Heating shall be controlled by temperature indicating crayons and shall reach a maximum temperature of 1500 degrees Fahrenheit. Reinforcement shall not be artificially cooled until temperature has reduced naturally to below 600 degrees Fahrenheit. Bends shall be gradual and care shall be taken to prevent heating or cracking of concrete. If reinforcement must be field bent more than once, the Contractor shall issue an RFI indicating which bars need to be field bent additionally.

## **PART 3 EXECUTION**

### **3.01 PLACEMENT**

- A. Place, support and secure reinforcement against displacement. Do not deviate from required position.
- B. Do not displace or damage vapor barrier.
- C. Accommodate placement of formed openings.
- D. Placement of reinforcing steel shall be done in cooperation with requirements of other trades. No cutting of reinforcement or displacement of bars shall be done by any of the trades without the consent of the Architect, and then only when adequate reinforcement is provided to replace the design requirements.
- E. Use templates to locate all column and footing dowels.
- F. Maintain concrete cover around reinforcing as indicated on drawings.
- G. Bond and ground all reinforcement to requirements of Section 26 0526.

### **3.02 FIELD QUALITY CONTROL**

- A. A special inspections and testing agency (SITA) will perform field quality control tests and inspections, as specified in Sections 01 4516 and 01 4533.

**END OF SECTION**

**SECTION 03 3000  
CAST-IN-PLACE CONCRETE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Concrete building frame members.
- B. Concrete for composite floor construction.
- C. Floors and slabs on grade.
- D. Concrete Floor Topping and Feathering Material.
- E. Joint devices associated with concrete work.
- F. Miscellaneous concrete elements, including equipment pads, equipment pits, light pole bases, flagpole bases, thrust blocks, and manholes.
- G. Concrete curing.

**1.02 COORDINATION OF CIVIL AND STRUCTURAL CONCRETE SPECIFICATIONS**

- A. This specification section applies to all concrete designs provided on the Structural Drawings. For clarification, this specification section applies to interior and exterior concrete designs provided on the Structural Drawings (possibly including but not limited to sidewalks, patios, pavement, ramps, stairs, retaining walls, etc.). For exterior concrete designs not shown on the Structural Drawings but shown on the Civil Drawings, the provisions of this specification section only applies when there is not a conflicting specification elsewhere in the Project Manual or Civil Drawings.

**1.03 RELATED REQUIREMENTS**

- A. Section 03 1000 - Concrete Forming and Accessories: Forms and accessories for formwork.
- B. Section 03 2000 - Concrete Reinforcing.

**1.04 REFERENCE STANDARDS**

- A. ACI 117 - Specification for Tolerances for Concrete Construction and Materials 2010 (Reapproved 2015).
- B. ACI 301 - Specifications for Concrete Construction 2020.
- C. ACI 302.1R - Guide to Concrete Floor and Slab Construction 2015.
- D. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete 2000 (Reapproved 2009).
- E. ACI 305R - Guide to Hot Weather Concreting 2020.
- F. ACI 306R - Guide to Cold Weather Concreting 2016.
- G. ACI 308R - Guide to External Curing of Concrete 2016.
- H. ACI 318 - Building Code Requirements for Structural Concrete 2019 (Reapproved 2022).
- I. ACI 347R - Guide to Formwork for Concrete 2014 (Reapproved 2021).
- J. ASTM C33/C33M - Standard Specification for Concrete Aggregates 2023.
- K. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens 2021.
- L. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete 2023.
- M. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete 2020.
- N. ASTM C150/C150M - Standard Specification for Portland Cement 2022.
- O. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method 2016.

- P. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete 2010a (Reapproved 2016).
- Q. ASTM C330/C330M - Standard Specification for Lightweight Aggregates for Structural Concrete 2023.
- R. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete 2019, with Editorial Revision (2022).
- S. ASTM C618 - Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete 2023, with Editorial Revision.
- T. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing 2017.
- U. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types) 2018.
- V. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover 2008a (Reapproved 2019).
- W. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
- X. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs 2017 (Reapproved 2023).
- Y. ASTM F 1249
- Z. COE CRD-C 48 - Handbook for Concrete and Cement Standard Test Method for Water Permeability of Concrete 1992.
- AA. COE CRD-C 572 - Handbook for Concrete and Cement Corps of Engineers Specifications for Polyvinylchloride Waterstop 1974.
- BB. NSF 61 - Drinking Water System Components - Health Effects 2022, with Errata.

#### **1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. The Contractor shall submit all proposed mix designs to the Architect for review before use. Each mix design shall clearly identify where the Contractor proposes use, such as indicating "Drilled Piers", "Auger Cast-In-Place Piles", "Concrete Columns", "Insulating Concrete Formed Walls", "Cast-In-Place Concrete Retaining Walls", "Precast Tilt Wall Panels", "Light Pole Bases", "Grade Beams", "Interior Slabs on Grade & Interior Slabs on Metal Deck", "Slabs on Temporary Formwork", "Exterior Slabs on Grade, Exterior Slabs on Metal Deck and Miscellaneous Concrete", "Exterior Slabs on Temporary Formwork", "Freezer Slabs & Cooler Slabs", etc. Failure to clearly identify where mixes are proposed for use is a suitable reason for rejection. To expedite approval it is suggested that all mix designs related to Structural items be submitted separately from all mix designs related to Civil items as these two categories are reviewed by different parties. Furthermore, to expedite approval, it shall be permitted to email Structural Mix Designs directly to the Structural Engineer or Record and request approval.
- C. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
  - 1. For curing compounds, refer to Submission requirements below before products shall be permitted and provide letters of acceptance from the flooring subcontractor and provide data on method of removal in the event of incompatibility with floor covering adhesives.
  - 2. For vapor barriers, submit all of the following:
    - a. Product data and installation instructions.
    - b. Documentation from the manufacturer or patent-holder indicating that:
      - 1) The product is a minimum 15 mil product;
      - 2) The product is suitable for installation in contact with soil or granular fill under concrete slabs;

- 3) Where a concrete-adhering tape is specified for use (e.g. over voidforms), both the vapor barrier product manufacturer or patent-holder and the concrete-adhering tape manufacturer or patent-holder have indicated that the concrete-adhering tape is compatible with the submitted vapor barrier product, and that test data indicates the tape will adhere to the concrete with a minimum 12 pounds per linear inch of tape.
- c. Documentation from an independent agency indicating that:
  - 1) The independent agency is a testing firm or professional engineering firm which shares no ownership with the product manufacturer or patent-holder;
  - 2) The independent agency randomly selected the samples for testing from one or more warehouses (or other distribution locations) and then shipped the samples to one or more testing laboratories;
  - 3) Testing was completed within four years before construction proposals are due for this project, by one or more independent testing laboratories;
  - 4) The testing fully complied with ASTM E 1745 or identifying any deviations from ASTM E 1745 (including deviations from any documents referenced by ASTM E 1745), with permeance testing having at least two sample replicates (instead of the three required by ASTM E 1745) for each of the five permeance testing scenarios required (baseline and the four conditions required by ASTM E 154 Sections 8, 11, 12 and 13);
  - 5) The puncture, tensile strength and permeance results of the testing comply with the requirements for a 15 mil, Class A vapor barrier according to ASTM E 1745; and,
  - 6) The average permeance of all samples tested for each of the five permeance testing scenarios is less than or equal to 0.010 Perms [grains/(sq ft\*hr\*in.Hg)] (with the permeance results being considered to the nearest 0.001 Perm) per ASTM F 1249 or ASTM E 96 after mandatory conditioning tests per ASTM E 154 Sections 8, 11, 12 and 13.
- D. Samples: Submit samples of underslab vapor barrier and tape to be used if making a substitution request.
- E. Test Reports: Submit report for each test or series of tests specified.
- F. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.
- G. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

## **1.06 QUALITY ASSURANCE**

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
  1. Maintain one copy of each document on site.
- B. Follow recommendations of ACI 305R when concreting during hot weather.
- C. Follow recommendations of ACI 306R when concreting during cold weather.

## **PART 2 PRODUCTS**

### **2.01 FORMWORK**

- A. Comply with requirements of Section 03 1000.

### **2.02 REINFORCEMENT MATERIALS**

- A. Comply with requirements of Section 03 2000.

### **2.03 CONCRETE MATERIALS**

- A. Cement: ASTM C150 or ASTM C 1157, Type I/II Portland type.
  1. Acquire cement for entire project from same source.
- B. Fine and Coarse Aggregates: ASTM C33/C33M.

1. Acquire aggregates for entire project from same source.
2. Fine aggregate:
  - a. Provide washed natural or manufactured sand having strong, hard, durable particles, and containing not more than 2% by weight of deleterious matter such as clay lumps, mica, shale, or schist.
3. Coarse aggregate:
  - a. Provide coarse aggregate consisting of clean, hard, fine grained, sound crushed rock or washed gravel, or a combination of both, containing not more than 5% by weight of flat, chip-like, thin, elongated, friable, or laminated pieces, nor more than 2% by weight of shale or cherty material.
  - b. Use coarse aggregate of the largest practicable size for each condition of placement, subject to the following maximum size limitations:
    - 1) Do not exceed 3/4 of the clear distance between reinforcing bars, 1/5 of the narrowest dimension between sides of forms, or 1/3 the depth of any slab section.
  - c. For each slab mix design submittal (excluding pavement designed by the Civil Engineer and shown on the Civil Drawings): The concrete supplier shall provide a combined (coarse and fine) sieve analysis for the proposed aggregate blend, using sieve data measured within the past 3 months. It shall be permitted for the concrete supplier to submit a combined sieve analysis that is calculated based on individual sieve analyses. The combined sieve analysis shall show the percent retained on each sieve (not the cumulative percent retained) and shall meet the following requirements:
    - 1) Sizes: 1", 3/4", 1/2", 3/8", #4, #8, #16, #30, #50, #100.
    - 2) No sized other than those listed shall be on the analysis.
    - 3) 0% to 5% shall be retained on the top (largest) size.
    - 4) 1.5% to 5% shall be retained on the #100 sieve.
    - 5) 2% to 20% shall be retained on all intermediate sieves.
    - 6) The percent retained on each intermediate sieve shall not be greater than 1.2 times the percent retained on any adjacent intermediate sieve.
    - 7) If the percent retained requirements above cannot be met by using multiple aggregate piles from the plant, the Contractor shall assume for bidding purposes that outside sources will be required.
    - 8) Requests for variances are permitted to be submitted to the Engineer for consideration.
- C. Lightweight Aggregate: ASTM C330/C330M.
- D. Fly Ash: ASTM C618 C or F
- E. Water: ASTM C94/C94M or potable.
- F. Concrete Floor Topping and Feathering Material:
  1. At feathered locations, provide cement-based self-leveling underlayment.
  2. Provide manufacturer's recommended primer for standard absorbent concrete.
  3. Aggregate shall be well graded, washed gravel (1/8" to 1/4" or larger) for use when underlayment is installed over 1 1/2" thick.
  4. Water shall be clean, potable, and sufficiently cool (not warmer than 70°F).
  5. Acceptable Manufacturers: Subject to compliance with requirements herein, provide products from one of the following manufacturers.
    - a. Ardex Engineered Cements: [www.ardex.com](http://www.ardex.com)
    - b. (Level-Right) Maxxon Corporation: [www.level-right.com](http://www.level-right.com)
    - c. Bonsal American: [www.bonsal.com](http://www.bonsal.com)
    - d. Substitutions: See Section 01 6000 - Product Requirements.

## 2.04 ADMIXTURES

- A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- B. Dispense in compliance with manufacturer's recommendations with particular attention to possible undesirable chemical reaction between products when mixed in concentrated form.
- C. Air Entrainment Admixture: ASTM C260/C260M.
- D. High Range Water Reducing Admixture: ASTM C494/C494M Type F.
  - 1. Manufacturers:
    - a. MasterGlenium 1466 by BASF Corporation.
    - b. Substitutions: See Section 01 6000 - Product Requirements.
- E. Mid-Range Water Reducing Admixture: Complying with ASTM C494/C494M Type A and/or Type F and having a maximum of 25% lignosulfonates.
  - 1. Manufacturers:
    - a. POLYHEED 1020 by Degussa Admixtures
    - b. SIKAMENT 686 by Sika (214) 878-3669
    - c. PLASTOL 341 by Euclid Chemical Co. (216) 531-9222
    - d. POZZOLITH 200N by BASF Corporation
    - e. MasterGlenium 1466 by BASF Corporation
    - f. Substitutions: See Section 01 6000 - Product Requirements. A letter from the manufacturer will be required indicating that the material does not have more than 25% lignosulfonates.

## 2.05 ACCESSORY MATERIALS

- A. Underslab Vapor Barrier shall meet all of the following requirements:
  - 1. The product shall be a minimum 15 mil product.
  - 2. The product shall be suitable for installation in contact with soil or granular fill under concrete slabs according to the manufacturer or patent-holder.
  - 3. Within four years before construction proposals are due for this project, an independent agency (a testing firm or professional engineering firm which shares no ownership with the product manufacturer or patent-holder) shall have randomly selected the samples for testing from one or more warehouses (or other distribution locations) and then shipped the samples to one or more testing laboratories which then completed testing in compliance with ASTM E 1745 having at least two sample replicates (instead of the three required by ASTM E 1745) for each of the five permeance testing scenarios required (baseline and the four conditions required by ASTM E 154 Sections 8, 11, 12 and 13), with the puncture, tensile strength and permeance results of the testing complying with the requirements for a 15 mil, Class A vapor barrier according to ASTM E 1745, and the average permeance of all samples tested for each of the five permeance testing scenarios being less than or equal to 0.010 Perms [grains/(sq ft\*hr\*in.Hg)] (with the permeance results being considered to the nearest 0.001 Perm) per ASTM F 1249 or ASTM E 96 after mandatory conditioning tests per ASTM E 154 Sections 8, 11, 12 and 13.
  - 4. Accessory Products: At slabs on grade and over the subgrade of all crawlspaces, install vapor barrier manufacturer's recommended tape for sealing seams and penetrations in vapor barrier. At slabs poured over carton void forms, install the vapor barrier over the Masonite and tape all joints (and tape the perimeter of the vapor barrier under the slab area) with a concrete-adhering tape that bonds to the concrete with a minimum tensile strength of 12 pounds per linear inch. A letter or other documentation from the manufacturer or patent-holder of the vapor barrier and the manufacturer or patent-holder of any concrete-adhering tape required for this project shall be submitted to the Architect indicating that both products are compatible. At all areas where vapor barrier is installed, install the vapor barrier manufacturer's recommended adhesive, mastic, prefabricated boots, etc.

- B. At slabs over crawlspace, unless specifically noted otherwise, crawlspace shall consist of 3" thick unreinforced mud slab. If crawlspace grading indicates locations where mud slab is not required, provide vapor barrier noted above covered with 2" of 3/8" diameter pea gravel.
  - 1. Manufacturers and/or Patent-Holders:
    - a. Stego Industries, LLC: [www.stegoindustries.com](http://www.stegoindustries.com). (Stego 15 mil - Class A)
    - b. Poly-America: [www.poly-america.com](http://www.poly-america.com) (Yellow-Guard 15 mil - Class A)
    - c. Substitutions: See Section 01 6000 - Product Requirements.

## **2.06 BONDING AND JOINTING PRODUCTS**

- A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.
- B. Epoxy Bonding System:
  - 1. Complying with ASTM C881/C881M and of Type required for specific application.
- C. Waterstops: Self-sealing, non-swelling preformed joint sealant.
  - 1. Single component, self-sealing adhesive compound, extruded in a square cross-section between two quick-release protective wrappers.
    - a. Meets Federal Specification SSS-210
    - b. Certified NSF/ANSI Standard 61 for use in potable water systems
    - c. Manufacturers:
      - 1) Henry Company; Synko-Flex Waterstop: [www.us.henry.com](http://www.us.henry.com)
      - 2) Substitutions: See Section 01 6000 - Product Requirements.
  - 2. Flexible PVC Waterstop. Dumbbell Configuration.
    - a. Certified NSF/ANSI Standard 61 for use in potable water systems
    - b. Manufacturers:
      - 1) Sika USA; Greenstreak Waterstop: [usa.sika.com](http://usa.sika.com)
      - 2) Substitutions: See Section 01 6000-Product Requirements.
- D. Reglets: See Section 03 1000 - Concrete Forming and Accessories
- E. Joint Filler: See Section 03 1000 - Concrete Forming and Accessories
- F. Slab Construction Joint Devices: See Section 03 1000 - Concrete Forming and Accessories

## **2.07 CURING MATERIALS**

- A. Evaporation Reducer: Liquid thin-film-forming compound that reduces rapid moisture loss caused by high temperature, low humidity, and high winds; intended for application immediately after concrete placement.
  - 1. Manufacturers:
    - a. W. R. Meadows, Inc; Evapre or Evapre-RTU: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
- B. At all building slabs, except locations where a "sealer" is shown on the Architectural Drawings: Wet Curing with Potable Water that is not detrimental to concrete.
  - 1. Unless otherwise approved as a substitution request, Proposers shall assume for Proposal purposes that curing compounds shall not be used anywhere on this project and that only wet curing shall be permitted. However, if requested as a substitution request, the Architect may elect to permit this material at certain locations if the Contractor verifies that the warranty will be met: Curing Compound, Naturally Dissipating, Clear, water-based, liquid membrane-forming compound, that dissipates within 3 to 5 weeks; complying with ASTM C309. Note: Many flooring installer Subcontractors will no longer warranty flooring if any kind of curing compound is used! It is the Contractor's responsibility for verifying compatibility of flooring materials and adhesives with any proposed curing compound before proposing curing compounds.
- C. At all building slabs where a "sealer" is shown on the Architectural Drawings: Curing and Sealing Compound, Semi-Gloss: Liquid, membrane-forming, dries clear, non-yellowing acrylic-based polymer; complying with ASTM C1315 Type 1 Class A.
  - 1. Vehicle: Solvent-based.



2. Solids by Mass: 25 percent, minimum.
3. VOC Content: Ozone Transport Commission (OTC) compliant.
4. Manufacturers:
  - a. BASF; MasterKure CC 250 SB: [www.master-builders-solutions.basf.us](http://www.master-builders-solutions.basf.us)
  - b. W.R. Meadows, Inc.; CS-309-25 OTC: [www.wrmeadows.com](http://www.wrmeadows.com).
  - c. Substitutions: See Section 01 6000 - Product Requirements.

## **2.08 CONCRETE MIX DESIGN REQUIREMENTS**

- A. Note to Building Official: The specified air contents for this project are based on the interpretation that all concrete on this project is under Exposure Category F0 conditions in which Freezing and Thawing concerns are "Not Applicable". The International Building Code requires that air contents of concrete be within ranges specified by ACI 318 for various Exposure Categories depending on the probability of exposure to moisture before freezing, and probability of cycles of freezing and thawing. ACI Commentary describes F0 as concrete that will not be exposed to cycles of freezing; F1, exposed to cycles of freezing and thawing that will be occasionally exposed to moisture before freezing; F2, exposed to cycles of freezing and thawing that is in continuous contact with moisture before freezing; and F3, similar to F2 with exposure to deicing chemicals. The "not applicable" interpretation for this project is based on the very limited number of freeze thaw cycles that are likely to occur at this project and based on the consideration that high air contents can cause problems such as cracking and surface delamination.
- B. Refer to the schedule of mixes at the end of this specification section for requirements specific to different applications. It shall be permitted to submit to the Engineer any desired proprietary designs which deviate from the schedule of mixes if and only if all deviations from the schedule are clearly noted and if test data is provided indicating the performance of the concrete with regard to slump versus time, strength versus time, and air content.
- C. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
- D. Establish required average strength for each type of concrete on the basis of field experience, as specified in ACI 301. It shall be an obligation of the Contractor to produce and deposit concrete that will exceed specified strength twenty-eight days after placing. Concrete falling below specified strength required by ACI 318, as shown by cylinder test shall be removed by the Contractor and be replaced with concrete at specified strength at no cost to the Owner unless otherwise approved by the Engineer after evaluation.
- E. Concrete may be proportioned and mixed at the job, dry-batched and mixed at the job or be procured from a ready-mixed concrete plant. Whatever the method of production, concrete materials and concrete shall be stored handled and mixed in conformance with all requirements of ASTM C94, which apply to the particular method selected.
- F. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.
- G. Aggregate: As specified in Section 2.03 B.

## **2.09 MIXING**

- A. Transit Mixers: Comply with ASTM C94/C94M.
- B. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify lines, levels, and dimensions before proceeding with work of this section.

### **3.02 PREPARATION**

- A. Formwork: Comply with requirements Section 03 1000 - Concrete Forming and Accessories.

- B. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in accordance with bonding agent manufacturer's instructions.
  - 1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
  - 2. Use latex bonding agent only for non-load-bearing applications.
  - 3. At intersections of pours for concrete walls and beams (including foundation elements such as grade beams), install a 1 1/2" deep keyway that is a minimum of 1/3 the thickness and 1/3 the height (unless otherwise noted) and roughen the exposed surface of the first pour with a minimum 1/4" amplitude.
- C. Where new concrete with integral waterproofing is to be bonded to previously placed concrete, prepare surfaces to be treated in accordance with waterproofing manufacturer's instructions. Saturate cold joint surface with clean water, and remove excess water before application of coat of waterproofing admixture slurry. Apply slurry coat uniformly with semi-stiff bristle brush at rate recommended by waterproofing manufacturer.
- D. Vapor Barrier: At exterior floor slabs where indicated on the Structural Drawings Sheets and Notes and at all interior floor slabs, a vapor barrier under the floor slab shall be installed in accordance with ASTM E 1643 and as indicated in Part 2 of this Specification Section. Lap joints minimum 6 inches. Repair damaged vapor retarder before covering.
  - 1. Install compactible granular fill before placing vapor barrier at areas where slabs are poured on grade. Install void boxes and masonite before placing vapor barrier at areas where slabs are to be poured on void boxes. Do not place sand between the vapor barrier and the slab.

### **3.03 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS**

- A. Comply with requirements of Section 03 2000 - Concrete Reinforcing.

### **3.04 PLACING CONCRETE**

- A. Place concrete in accordance with ACI 304R.
- B. Place concrete for floor slabs in accordance with ACI 302.1R.
- C. Notify Architect not less than 48 hours prior to commencement of placement operations.
- D. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
- E. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

### **3.05 SLAB JOINTING**

- A. Locate joints as indicated on drawings.
- B. Anchor joint fillers and devices to prevent movement during concrete placement.
- C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.
- D. Repair underslab vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.
- E. Separate slabs on grade from vertical surfaces with joint filler as indicated on drawings.
- F. Place joint filler in floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- G. Extend joint filler from bottom of slab to within 1/2 inch of finished slab surface. Conform to Section 07 9200 for finish joint sealer requirements.
- H. Install joint devices in accordance with manufacturer's instructions.
- I. Install construction joint devices in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

- J. Install joint device anchors for expansion joint assemblies specified in Section 07 9513. Maintain correct position to allow joint cover to be flush with floor and wall finish.
- K. Apply sealants in joint devices in accordance with Section 07 9200.
- L. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- M. Place concrete continuously between predetermined expansion, control, and construction joints.
- N. Deposit concrete continuously or in layers of such thickness that no concrete will be deposited on concrete that has hardened sufficiently to cause formation of seams or planes of weakness within sections.
- O. Do not interrupt successive placement; do not permit cold joints to occur.
- P. Placing of concrete in supported elements shall not be started until concrete previously placed in columns and walls is no longer plastic.
- Q. Consolidate concrete by vibration, spading or rodding, so that concrete is thoroughly worked around reinforcement, around embedded items and into corners or forms, eliminating all air or stone pockets that may cause honeycombing, pitting or planes of weakness.
- R. Place saw-cuts in slabs-on-grade and topping slabs in saw cut pattern indicated. Saw-cuts in slab over void space are not permitted.
- S. Saw cut slab-on-grade and topping slab joints within 4 hours after placing. Use maximum 3/16 inch thick blade, cut into slab 1/4 depth of slab thickness. Saw-cuts in slab over void space are not permitted.
- T. Screed slabs on grade level, maintaining surface flatness of maximum 1/4 inch in 10 ft.

### **3.06 SEPARATE FLOOR TOPPINGS**

- A. Prior to placing floor topping, roughen substrate concrete surface and, roughen substrate concrete surface and remove deleterious material. Broom and vacuum clean.
- B. Place required dividers, edge strips, reinforcing, and other items to be cast in.
- C. Apply bonding agent to substrate in accordance with manufacturer's instructions.
- D. Apply sand and cement slurry coat on base course, immediately prior to placing toppings.
- E. Place concrete floor toppings to required lines and levels.
- F. Screed toppings level, maintaining surface flatness of maximum 1:1000.

### **3.07 FLOOR FLATNESS AND LEVELNESS TOLERANCES**

- A. Maximum Variation of Surface Flatness:
  - 1. Exposed Concrete Floors: 1/4 inch in 10 feet.
  - 2. Under Seamless Resilient Flooring: 1/4 inch in 10 feet.
  - 3. Under Carpeting: 1/4 inch in 10 feet.
- B. Correct the slab surface if tolerances are less than specified.
- C. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

### **3.08 CONCRETE FINISHING**

- A. Repair surface defects, including tie holes, immediately after removing formwork.
- B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
- C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as indicated on drawings and as follows:
  - 1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.

2. Grout Cleaned Finish: Wet areas to be cleaned and apply grout mixture by brush or spray; scrub immediately to remove excess grout. After drying, rub vigorously with clean burlap, and keep moist for 36 hours.
- D. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
  1. Surfaces to Receive Thick Floor Coverings: "Wood float" as described in ACI 302.1R; thick floor coverings include quarry tile, ceramic tile, and Portland cement terrazzo with full bed setting system.
  2. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 302.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, resinous matrix terrazzo, thin set quarry tile, and thin set ceramic tile.
  3. Other Surfaces to Be Left Exposed: "Steel trowel" as described in ACI 302.1R, minimizing burnish marks and other appearance defects.
  4. Broom Finish: Ramps, stair treads, sidewalks, porches and docks, concrete pads, Storm Shelter Roof Topping and bases for mechanical equipment. Steel trowel smooth. Brush after troweling with a soft bristle broom to create non skid surfaces perpendicular to the direction of travel.
- E. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:100 nominal.

### **3.09 CURING AND PROTECTION**

- A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
  1. Normal concrete: Not less than seven days.
- C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.
- D. Surfaces Not in Contact with Forms:
  1. Floor and Roof Slabs To Receive Adhesive-Applied Flooring or Roofing: Curing compounds and other surface coatings are usually considered unacceptable by flooring manufacturers, adhesive manufacturers, and roofing installers. If use of such materials is desired by the Contractor, the Contractor shall either obtain the approval of the flooring manufacturer and adhesive manufacturers, or roofing installer prior to use. Alternatively, the Contractor shall remove the surface coating after curing to flooring manufacturer's or roofing installer's satisfaction. Unless otherwise approved as a substitution request, the Contractor shall assume during bidding that curing compounds shall not be used anywhere on this project and that only wet curing shall be permitted. However, if requested by the Contractor as a substitution request or during construction, the Architect may elect to permit this material at certain locations. Generally, the Architect will require a letter from the flooring subcontractor or roofing installer guaranteeing that the curing compound is compatible with the flooring adhesive and flooring materials or roofing system.
  2. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
    - a. Ponding: Maintain 100 percent coverage of water over floor slab areas, continuously for 4 days.
    - b. Spraying: Spray water over floor slab areas and maintain wet.
    - c. Saturated Burlap: Saturate burlap-polyethylene and place burlap-side down over floor slab areas, lapping ends and sides; maintain in place.

### **3.10 FIELD QUALITY CONTROL**

- A. A Special Inspection and Testing Agency (SITA) will perform field quality control tests and inspections, as specified in Sections 01 4516 and 01 4533.

- B. Provide free access to concrete operations at project site and cooperate with appointed firm.
- C. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.

### **3.11 DEFECTIVE CONCRETE**

- A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.
- B. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.
- C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
- D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

### **3.12 PROTECTION**

- A. Do not permit traffic over unprotected concrete floor surface until fully cured.

### **3.13 SCHEDULE - CONCRETE MIX DESIGN REQUIREMENTS**

- A. "Drilled Pier" Mix: 3,000 psi 28 day concrete, 6" to 8" slump, 1.5% +/- 1.5% air content, air entraining agent not required, minimum 5 sacks of cement per cubic yard, up to 20% replacement using Class C or F fly ash permitted, mid or high range water reducing agents permitted.
- B. "Cast-in-place Concrete Columns" Mix: If any portion of the concrete will be exposed outside the building lines, this mix design shall not apply. 3,000 psi 28 day concrete, 6" to 8" slump, 1.5% +/- 1.5% air content using air entraining agent, minimum 5 sacks of cement per cubic yard, fly ash not permitted, mid-range water reducing agents permitted, high-range water reducing agents not permitted.
- C. "Light Pole/Flag Pole Bases" Mix: 3,000 psi 28 day concrete, 6" to 8" slump, 4.5% +/- 1.5% air content using air entraining agent as required, minimum 5 sacks of cement per cubic yard, fly ash not permitted for any elements which are part of a building system (e.g. exterior columns), up to 20% replacement of cement with Class C or Class F fly ash permitted for other site elements such as light pole bases, mid range and high range water reducing agents permitted. This mix shall not be used for specialty athletic lighting pole bases, unless approved in writing by the Contractor's Specialty Athletic Lighting Pole Foundation Engineer. Refer to Section 26 5670 submittal requirements.
- D. "Grade Beam and Pilasters" Mix: 3,000 psi 28 day concrete, 4" to 6" slump, 4.5% +/- 1.5% air content using air entraining agent as required, minimum 5 sacks of cement per cubic yard, up to 20% replacement of cement with Class C or Class F fly ash permitted. Mid range water reducing agents permitted, high range water reducing agents permitted.
- E. "Interior Slabs on Grade and Interior Slabs on Metal Deck" Mix: 3,000 psi 28 day concrete, maximum water to cement ratio of 0.5, 5" to 6" slump (Note: This is more stringent than the default ACI tolerance for slump), 1.5% +/- 1.5% air content, air entraining agent not permitted, minimum 5 sacks of cement per cubic yard with up to 20% replacement using Class F fly ash permitted, mid range water reducing agents permitted, high range water reducing agents not permitted. The slab aggregate gradation requirements in Section 2.03 B shall apply. If any portion of concrete is will be permanently in contact with exterior elements, Miscellaneous Concrete mix design shall apply.

- F. "Exterior Slabs on Grade, Exterior Slabs on Metal Deck and Miscellaneous Concrete" Mix: 3,000 psi 28 day concrete, maximum water to cement ratio of 0.50, 5" to 6" slump (Note: This is more stringent than the default ACI tolerance for slump), 4.5% +/- 1.5% total air content using air entraining agent, minimum 5 sacks of cement per cubic yard, up to 20% cement replacement using Class F fly ash permitted, Class C fly ash not permitted unless it also qualifies as a Class F fly ash, mid range water reducing agents permitted, high range water reducing agents not permitted. The slab aggregate gradation requirements in Section 2.03 B shall apply.
- G. "Exterior Slabs on Void Boxes and Exterior Slabs on any other Temporary Formwork" Mix: 4,000 psi 28 day concrete, maximum water to cement ratio of 0.50, 5" to 6" slump (Note: This is more stringent than the default ACI tolerance for slump), 4.5 +/- 1.5% total air content using air entraining agent, minimum 6 sacks of cement per cubic yard, up to 20% cement replacement using Class C or F fly ash permitted, mid range water reducing agents permitted, high range water reducing agents not permitted. The slab aggregate gradation requirements in Section 2.03 B shall apply.
- H. "Freezer Slabs and Cooler Slabs" Mix: 4,500 psi 28 day concrete, maximum water to cement ratio of 0.45, 5" to 6" slump (Note: This is more stringent than the default ACI tolerance for slump), 6.5% +/- 1.5% total air content, minimum 6.5 sacks of cement per cubic yard, up to 20% cement replacement using Class F fly ash permitted, Class C fly ash not permitted unless it also qualifies as a Class F fly ash, mid range water reducing agents permitted, high range water reducing agents not permitted. The slab aggregate gradation requirements in Section 2.03 B shall apply.

**END OF SECTION**

**SECTION 03 3543  
BONDED ABRASIVE POLISHED CONCRETE FLOORS**

**PART 1 – GENERAL**

**1.01 SECTION INCLUDES**

- A. Products and procedures for coloring and bonded abrasive polishing concrete floors using multi-step wet/dry mechanical process, and accessories indicated, specified, or required to complete polishing.

**1.02 DEFINITIONS**

- A. Terminology: As defined by CPAA.
- B. Polished Concrete: The act of changing a concrete floor surface, with or without aggregate exposure, to achieve a specified level of gloss.
- C. Bonded Abrasive Polished Concrete: The multi-step operation of mechanically grinding, honing, polishing of a concrete floor surface with bonded abrasives to cut a concrete floor surface and to refine each cut to the maximum potential to achieve a specified level of finished gloss as defined by the CPAA.

**1.03 SUBMITTALS**

- A. Product Data: Manufacturer's technical literature for each product indicated, specified, or required. Include manufacturer's technical data, application instructions, and recommendations.
- B. Installer Qualifications: Data for company, principal personnel, experience, and training specified in PART 1 "Quality Assurance" Article.
- C. Field Quality Control – Dynamic Coefficient of Friction Test Reports: Reports of testing specified in PART 3 "Field Quality Control" Article.
- D. Field Quality Control – Static Coefficient of friction test reports: report of testing specified in Part 3 "Field Quality Control" article.
- E. Maintenance Data: For inclusion in maintenance manual required by Division 01.
  - 1. Include instructions for maintenance of installed work, including methods and frequency recommended for maintaining optimum condition under anticipated use.
  - 2. Include precautions against cleaning products and methods which may be detrimental to finishes and performance.

**1.04 QUALITY ASSURANCE**

- A. Polisher Qualifications:
  - 1. Experience: Company experienced in performing specified work similar in design, products, and extent to scope of this Project; with a record of successful in-service performance; and with sufficient production capability, facilities, and personnel to produce specified work.
  - 2. Supervision: Maintain competent supervisor who is at Project during times specified work is in progress, and is currently certified as Craftsman - Level I or higher by CPAA.
  - 3. Manufacturer Qualification: Approved by manufacturer to apply liquid applied products.
- B. Walkway Auditor: Certified by CPAA or NFSI to test bonded abrasive polished concrete floors for dynamic and static coefficient of friction according to ANSI B101.1 and B101.3.
- C. Coefficient of Friction: Achieve following coefficient of friction by field quality control testing in accordance to the following standards:
  - 1. ANSI B101.1 Static Coefficient of Friction - Achieve a minimum of .42 for level floor surfaces.
  - 2. ANSI B101.3 Dynamic Coefficient of Friction - Achieve a minimum of .35 for level floor surfaces.

- D. Field Mock-up: Before performing work of this Section, provide following field mock-up to verify selections made under submittals and to demonstrate aesthetic effects of polishing. Approval does not constitute approval of deviations from Contract Documents, unless Architect specifically approves deviations in writing.
1. Form, reinforce, and cast concrete slab for 10 foot square field mock-up.
  2. Concrete shall be same mix design as scheduled for Project.
  3. Placement and finishing work shall be performed by same personnel as will place and finish concrete for Project.
  4. Mock-up shall be representative of work to be expected.
  5. Perform grinding, honing, and polishing work as scheduled for Project using same personnel as will perform work for Project.
  6. Approval is for following aesthetic qualities:
    - a. Compliance with approved submittals.
    - b. Compliance with specified aggregate exposure.
    - c. Compliance with specified finished gloss level.
    - d. Compliance with specified color.
  7. Obtain Architect's approval before starting work on Project.
  8. Protect and maintain approved field mock-ups during construction in an undisturbed condition as a standard for judging completed work.
- E. Pre-Installation of Concrete Conference: Prior to placing concrete for areas scheduled for polishing, conduct conference at Project to comply with requirements of applicable Division 01 Sections.
1. Required Attendees:
    - a. Owner.
    - b. Architect.
    - c. Contractor, including supervisor.
    - d. Concrete producer.
    - e. Concrete finisher, including supervisor.
    - f. Concrete polisher, including supervisor.
    - g. Technical representative of liquid applied product manufacturers.
    - h. Walkway auditor.
  2. Minimum Agenda: Polisher shall demonstrate understanding of work required by reviewing and discussing procedures for, but not limited to, following:
    - a. Tour field mock-up and representative areas of required work, discuss and evaluate for compliance with Contract Documents, including substrate conditions, surface preparations, sequence of procedures, and other preparatory work performed by other installers.
    - b. Review Contract Document requirements.
    - c. Review approved submittals and field mock-up.
    - d. Review procedures, including, but not limited to:
    - e. Applicable Division 03 Section on cast-in-place concrete
      - 1) Specific mix design.
      - 2) Specified curing methods/procedures.
      - 3) Projected 3, 10, and 28 day compression strength test related to specified aggregates exposure for finished floor and project phasing.
      - 4) Protection of concrete substrate during construction and prior to polishing process
      - 5) Project phasing and scheduling for each step of grinding, honing and polishing operations including, but not limited to:
        - (a) Quality of qualified personnel committed to project.
        - (b) Quality and size of grinders committed to project.
        - (c) Proper disposal of concrete slurry and/or concrete dust.
      - 6) Details of each step of grinding, honing, and polishing operations.



- (a) Application of color.
  - (b) Application of liquid applied products.
  - (c) Protecting polished concrete floors after polishing work is complete.
- 3. Reports: Record discussions, including decisions and agreements reached, and furnish copy of record to each party attending.

### **1.05 FIELD CONDITIONS**

- A. Damage and Stain Prevention: Take precautions to prevent damage and staining of concrete surfaces to be polished.
  - 1. Prohibit use of markers, spray paint, and soapstone.
  - 2. Prohibit improper application of liquid membrane film forming curing compounds.
  - 3. Prohibit vehicle parking over concrete surfaces.
  - 4. Prohibit pipe-cutting operations over concrete surfaces.
  - 5. Prohibit storage of any items over concrete surfaces for not less than 28 days after concrete placement.
  - 6. Prohibit ferrous metals storage over concrete surfaces.
  - 7. Protect from petroleum, oil, hydraulic fluid, or other liquid dripping from equipment working over concrete surfaces.
  - 8. Protect from acids and acidic detergents contacting concrete surfaces.
  - 9. Protect from painting activities over concrete surfaces.
- B. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting liquid applied product application.

## **PART 2 – PRODUCTS**

### **2.01 LIQUID APPLIED PRODUCTS**

- A. Liquid Densifier: An Aqueous solution of Silicon Dioxide dissolved in one of the following Hydroxides that penetrates into the concrete surface and reacts with the Calcium Hydroxide to provide a permanent chemical reaction that hardens and densifies the wear surface of the cementitious portion of the concrete. All of the following have the same chemistry varying only by the alkali used for solubility of the Silicon Dioxide.
  - 1. Sodium Silicate
  - 2. Potassium Silicate
  - 3. Lithium Silicate
  - 4. Alkalis solution of Colloidal Silicates or Silica
- B. Dye: Non-film forming soluble colorant dissolved in a carrier designed to penetrate and alter coloration and appearance of a concrete floor surface without a chemical reaction.
- C. Sealer - Impregnating Stain Protection: Non film forming stain and food resistant penetrating sealer designed to be applied to densified and polished concrete which meets the requirements of OSHA for slip resistance as tested by ASTM D 2047 and stain resistance of ASTM D 1308.

### **2.02 ACCESSORIES**

- A. Repair Material: A product that is designed to repair cracks and surface imperfections. The specified material must have sufficient bonding capabilities to adhere after the polishing to the concrete surface and provide abrasion resistance equal to or greater than the surrounding concrete substrate.
- B. Grout Material: A thin mortar used for filling spaces. Acceptable products shall be:
  - 1. Epoxy, urethane, polyurea, or polyaspartic resins.
  - 2. Latex or acrylic binders mixed with cement dust from previous grinding steps.
  - 3. Silicate binders mixed with cement dust from previous grinding steps.
- C. Protective Cover: Non-woven, puncture and tear resistant, polypropylene fibers laminated with a multi-ply, textured membrane, not less than 18 mils in thickness.

## **2.03 POLISHING EQUIPMENT**

- A. Field Grinding and Polishing Equipment:
  - 1. A multiple head, counter rotating, walk behind or ride on machine, of various size and weights, with diamond tooling affixed to the head for the purpose of grinding concrete. Excludes janitorial maintenance equipment.
  - 2. If dry grinding, honing, or polishing, use dust extraction equipment with flow rate suitable for dust generated, with squeegee attachments.
  - 3. If wet grinding, honing, or polishing, use slurry extraction equipment suitable for slurry removal and containment prior to proper disposal.
- B. Edge Grinding and Polishing Equipment: Hand-held or walk-behind machines which produces same results, without noticeable differences, as field grinding and polishing equipment.
- C. Burnishing Equipment: High speed walk-behind or ride-on machines capable of generating 1000 to 2000 revolutions per minute and with sufficient head pressure of not less than 20 pounds to raise floor temperature by 20 degrees F.
- D. Diamond Tooling: Abrasive tools that contain industrial grade diamonds within a bonded matrix (such as metallic, resinous, ceramic, etc) that are attached to rotating heads to refine the concrete substrate.
  - 1. Bonded Abrasive: Abrasive medium that is held within a bonding that erodes away to expose new abrasive medium as it is used.
  - 2. Metal Bond Tooling: Diamond tooling that contains industrial grade diamonds with a metallic bonded matrix that is attached to rotating heads to refine the concrete substrate. These tools are available in levels of soft, medium, and hard metallic matrices that are matched with contrasting concrete substrates (i.e. hard matrix/soft concrete, medium matrix/medium concrete, soft matrix/hard concrete) and are typically used in the grinding and early honing stages of the polishing process.
  - 3. Resin Bond Tooling: Diamond tooling that contains industrial grade diamonds within a resinous bonded matrix (poly-phenolic, ester-phenolic, thermoplastic-phenolic) that is attached to rotating heads to refine the concrete substrate. Resin bond tooling does not have the soft/medium/hard characteristics of metal bond tooling and are typically used for the later honing and polishing stages of the polishing process.
  - 4. Hybrid Tooling: Diamond tooling that combines metal bond and resin bond that has the characteristics of both types of tooling. These types of tools are typically used as either transitional tooling from metal bond tools to resin bond tools or as a first cut tool on smooth concrete surfaces.
  - 5. Transitional Tooling: Diamond tooling that is used to refine the scratch pattern of metal bond tooling prior to the application of resin bond tooling in an effort to extend the life of resin bond tooling and to create a better foundation for the polishing process.
  - 6. Abrasive Pad: An abrasive pad, resembling a typical floor maintenance burnishing pad, that has the capability of refining the concrete surface on a microscopic level that may or may not contain industrial grade diamonds. These pads are typically used for the maintenance and/or restoration of previously installed polished concrete flooring.

## **PART 3 – EXECUTION**

### **3.01 EXAMINATION**

- A. Acceptance of Surfaces and Conditions:
  - 1. Examine substrates to be polished for compliance with requirements and other conditions affecting performance.
    - a. Concrete Finished Floor Flatness according to applicable Division 03 Section on cast-in-place concrete.
    - b. Concrete curing methods according to applicable Division 03 Section on cast-in-place concrete.
    - c. Concrete Compression strength per according to applicable Division 03 Section on cast-in-place concrete.

- B. Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents.
- C. Starting work within a particular area will be construed as acceptance of surface conditions.

### **3.02 PREPARATION**

- A. Cleaning New Concrete Surfaces:
  - 1. Prepare and clean concrete surfaces.
  - 2. Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, paint splatter, and other contaminants incompatible with liquid applied products and polishing.

### **3.03 VAPOR TESTING CONCRETE FLOORS**

- A. Alkalinity:
  - 1. Test Method: Measure pH according to method indicated in ASTM F 710.
  - 2. Acceptable Results: pH between 8 and 10.
- B. Moisture Vapor Transmission Rate:
  - 1. Test Method: Perform anhydrous calcium chloride test according to ASTM F 1869.
  - 2. Acceptable Results: Not more than 5 pounds per 1000 square feet in 24 hours.
- C. Relative Humidity:
  - 1. Test Method: Perform relative humidity test using in situ probes according to ASTM F 2170.
  - 2. Acceptable Results: Not more than 75 percent.

### **3.04 COLORING CONCRETE FLOORS**

- A. Dye or Pigmented Micro Stain Application:
  - 1. Apply solution by methods and techniques required by manufacturer to produce finish matching approved field mock-ups.
  - 2. Maintain wet edge, working newly applied solution into edges of adjacent wet edges of previously treated surfaces.
  - 3. Maintain consistent saturation throughout application.
  - 4. Avoid splashing, dripping, or puddling of solution on adjacent substrates.
  - 5. When color matches approved mock-ups, neutralize as required by manufacturer.

### **3.05 POLISHING CONCRETE FLOORS**

- A. Perform all polishing procedures to ensure a consistent appearance from wall to wall.
- B. Initial Grinding:
  - 1. Use grinding equipment with metal or semi-metal bonded tooling.
  - 2. Begin grinding in one direction using sufficient size equipment and diamond tooling to meet specified aggregate exposure class.
  - 3. Make sequential passes with each pass perpendicular to previous pass using finer grit tool with each pass, up to 100 grit metal bonded tooling.
  - 4. Achieve maximum refinement with each pass before proceeding to finer grit tools.
  - 5. Clean floor thoroughly after each pass using dust extraction equipment properly fitted with squeegee attachment or walk behind auto scrubber suitable to remove all visible loose debris and dust.
  - 6. Continue grinding until aggregate exposure matches approved field mock-ups.
- C. Treating Surface Imperfections:
  - 1. Mix patching compound or grout material with dust created by grinding operations, manufacturer's tint, or sand to match color of adjacent concrete surfaces.
  - 2. Fill surface imperfections including, but not limited to, holes, surface damage, small and micro cracks, air holes, pop-outs, and voids with grout to eliminate micro pitting in finished work.

3. Work compound and treatment until color differences between concrete surface and filled surface imperfections are not reasonably noticeable when viewed from 10 feet away under lighting conditions that will be present after construction.
- D. Liquid Densifier Application: Apply undiluted to point of rejection, remove excess liquid, and allow curing according to manufacturers instructions.
- E. Grout Grinding:
  1. Use grinding equipment and appropriate grit and bond diamond tooling.
  2. Apply grout, forced into the pore structure of the concrete substrate, to fill surface imperfections.
  3. Clean floor thoroughly after each pass using dust extraction equipment properly fitted with squeegee attachment or walk behind auto scrubber suitable to remove all visible loose debris and dust.
- F. Honing:
  1. Use grinding equipment with hybrid or resin bonded tooling.
  2. Hone concrete in one direction starting with a 100 grit tooling and make as many sequential passes as required to remove scratches, each pass perpendicular to previous pass, up to 400 grit tooling reaching maximum refinement with each pass before proceeding to finer grit tooling.
  3. Clean floor thoroughly after each pass using dust extraction equipment properly fitted with squeegee attachment or walk behind auto scrubber suitable to remove all visible loose debris and dust.
- G. Polishing:
  1. Use polishing equipment with resin-bonded tooling.
  2. Begin polishing in one direction starting with 800 grit tooling.
  3. Make sequential passes with each pass perpendicular to previous pass using finer grit tooling with each pass until the specified level of gloss has been achieved.
  4. Achieve maximum refinement with each pass before proceeding to finer grit pads.
  5. Clean floor thoroughly after each pass using dust extraction equipment properly fitted with squeegee attachment or walk behind auto scrubber suitable to remove all visible loose debris and dust.
  6. Stain Protection: Uniformly apply and remove excessive liquid according to manufacturer's instructions. Final film thickness should be less than .05 mils after cure.
  7. Final Polish: Using burnishing equipment and finest grit abrasive pads, burnish to uniform reflective sheen matching approved field mock-up.
- H. Final Polished Concrete Floor Finish:
  1. Aggregate Exposure Class B - Fine / Sand Aggregate Finish: Remove not more than 1/16 inch of concrete surface by grinding and polishing resulting in majority of exposure displaying fine aggregate with no, or small amount of, medium aggregate at random locations.
  2. Finished Gloss Level 3 - Semi-Polished Appearance:
    - a. Procedure: Recommended not less than 4 steps with full refinement of each diamond tool with one application of densifier.
    - b. Gloss Measurement: Determine the specular gloss by incorporating the following:
      - 1) Reflective Clarity Reading: Not less than 65 according to ASTM D5767 prior to the application of sealers.
      - 2) Reflective Sheen Reading: Not less than 35 according to ASTM D523 prior to the application of sealers.

### 3.06 FIELD QUALITY CONTROL

- A. Field Testing: Engage a qualified walkway auditor to perform field testing to determine if polished concrete floor finish complies with specified coefficient of friction;
  1. ANSI B101.1 for static coefficient of friction
  2. ANSI B101.3 for dynamic coefficient of friction

**3.07 CLOSEOUT ACTIVITIES**

- A. Maintenance Training: CPAA Craftsman shall train Owner's designated personnel in proper procedures for maintaining polished concrete floor.

**3.08 PROTECTION**

- A. Covering: After completion of polishing, protect polished floors from subsequent construction activities with protective covering.

**END OF SECTION**



**SECTION 03 3800  
POST-TENSIONED CONCRETE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Cast-in-place post-tensioned concrete framing members and slabs.
- B. Sheathing-covered tensioning tendons for unbonded system.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 1000 - Concrete Forming and Accessories.
- B. Section 03 2000 - Concrete Reinforcing: Reinforcement other than tensioning reinforcing.
- C. Section 03 3000 - Cast-in-Place Concrete: Concrete product, mix, and testing requirements; floor slab tolerances; curing and repair.
- D. Section 32 1828 - Tennis Courts: Included as part of the performance package. Soil preparation requirements.

**1.03 REFERENCE STANDARDS**

- A. ACI 117 - Specification for Tolerances for Concrete Construction and Materials 2010 (Reapproved 2015).
- B. ACI 301 - Specifications for Concrete Construction 2020.
- C. ACI 318 - Building Code Requirements for Structural Concrete 2019 (Reapproved 2022).
- D. ASTM A416/A416M - Standard Specification for Low-Relaxation, Seven-Wire Steel Strand for Prestressed Concrete 2018.
- E. CRSI (DA1) - CRSI Design Handbook 2008.

**1.04 DESIGN REQUIREMENTS**

- A. Size components to withstand design loads as indicated on the drawings.
  - 1. Maximum Allowable Deflection:  $1/360$  of span for live load.
- B. Design members exposed to the weather to accommodate movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects, when subject to seasonal or cyclic day/night temperature changes.
- C. Design framing members in accordance with ACI 301, ACI 318, ACI 117.
- D. Design deformed bar concrete reinforcement work in accordance with CRSI (DA1) - CRSI Handbook.
- E. Design system to accommodate construction tolerances, deflection of other building structural members, and clearances of intended openings.
- F. Design drawings and calculations shall be prepared and sealed by a registered structural engineer in the State of Texas indicating method of elongation calculation including values used for friction coefficients, anchorage seating loss, elastic shortening, creep, relaxation and shrinkage.

**1.05 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene one week before starting work of this section.
  - 1. Discuss tendon locations, sleeve locations, and cautions regarding cutting or core drilling.

**1.06 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for the following materials
  - 1. Concrete design mix and admixtures.
  - 2. Post-tensioning coating
  - 3. Tendon sheathing

4. Anchorage devices
  5. Tendon couplers
  6. Bar and tendon supports
  7. Pocket formers
  8. Sheathing repair tape
  9. Stressing-pocket patching material
- C. Shop Drawings: Indicate layout, tendon sizes, grouping, spacing, placing sequence, supports and locations, tendon supports, accessories, clearances required for jack, and pressure plate stresses.
1. Indicate formwork methods, materials, arrangement of joints, ties, shores, location of bracing and temporary supports, and schedule of erection and stripping.
  2. Describe tensioning sequence, type of jack, pressure monitoring device, anchorage set, tendon elongation and tendon cut-off procedures.
  3. Shop drawing sheets that include engineering information designed by the Contractor's Delegated Design Engineer shall be signed and sealed in accordance with the Texas Engineering Practice Act. Sheets that do not provide information designed by the Contractor's Engineer do not require being signed and sealed. Calculation packages require a signed and sealed cover sheet only. Any submittals requiring to be signed and sealed that are received without the signature and seal will be rejected without review.
- D. Design Data: Indicate calculations for loadings and stresses of tendon load elongation curves.
- E. Certificate: Certify that tendon strength characteristics meet or exceed specified requirements.
- F. Project Record Documents: Record actual locations of tendons; stressing sequence and tension loads established, and elongation of tendon .

#### **1.07 QUALITY ASSURANCE**

- A. Designer Qualifications: Under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in Texas.
- B. Installer Qualifications: Company specializing in performing the type of work specified in this section with minimum five years of documented experience, subject to the approval of the Architect.
- C. Welder Qualifications: Qualified within previous 12 months in accordance with AWS B2.1/B2.1M.

### **PART 2 PRODUCTS**

#### **2.01 FORMWORK**

- A. Formwork: As specified in Section 03 1000.

#### **2.02 REINFORCEMENT**

- A. Tendon Strand: Factory assembled, ASTM A416/A416M, Grade 250 (1725) seven-wire stranded steel cable; low-relaxation type; full length without splices; weldless; covered with polyethylene sheathing providing free movement of tendon within sheathing; complete with end anchorages.
1. Unless otherwise approved in advance by the Architect, provide plastic wrapped post-tensioning strands composed of stress-relieved, high-tensile, cold-drawn 7-wire strand of 1/2" diameter, meeting requirements of ASTM A416 and the following.
    - a. Ultimate strength: 270 Ksi
    - b. Temporary stress to overcome friction: 216 Ksi
    - c. Anchor stress: 189 Ksi
    - d. Effective stress: 162 Ksi
    - e. Elongation: 0.081" per ft.
  2. Provide mill tests and certificates.
    - a. Make two tests for each reel, and tag for identification purposes.



- b. Assign an individual lot number to each size of wire, strand, or bar to be shipped to the site, and tag accordingly.
  - c. Provide manufacturer's written warranty that the post-tensioning material is of the strength specified.
- B. Tendon Anchor: Type compatible with tendon, of strength not less than tendon.
- C. Tendon Coupling: Type compatible with tendon, of strength equal to or greater than tendon after attachment to tendons.
- D. Supplementary Reinforcement: As specified in Section 03 2000.

### **2.03 ACCESSORIES**

- A. Tendon Sheathing: Comply with ACI 423.6.
  - 1. Minimum Thickness: 0.050 inch (1.25 mm) for polyethylene or polypropylene with a minimum density of 0.034 lb/cu. in. (0.9 g/cu. cm).
  - 2. Retain first option in subparagraph below if an encapsulated system is specified. Retain second option if a non-encapsulated system is specified. Revise as necessary if an encapsulated system is specified only for certain portions of structure.
  - 3. Continuous over the entire length of tendon to provide watertight encapsulation of strand and between anchorages to prevent intrusion of cement paste or loss of coating for a non-encapsulated system.
- B. Sheathing Repair Tape: Elastic, self-adhesive, moisture proof tape with minimum width of 2 inches (50 mm), in contrasting color to tendon sheathing; non reactive with sheathing, coating, or prestressing steel.
- C. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Adhesive Tape Products, Inc.; PWT-20.
    - b. 3M; Tape 226.
    - c. Tyco Adhesives; Polyken 826.
- D. Tie Wire:
  - 1. Minimum 16 gage, 0.0508 inch diameter, annealed type.
  - 2. An acceptable patented system.
- E. Chairs, Bolsters, Bar Supports, Spacers: Size and shape for strength and support of reinforcement during tendon location, installation, and placement of concrete.
- F. Touch-up Primer: Corrosion resistive paint.

### **2.04 CONCRETE MATERIALS AND MIX DESIGN**

- A. Concrete Materials: As specified in Section 03 3000 unless otherwise requested by the Contractor's Tennis Court Engineer and approved by the Architect.
- B. Mix Design: The Contractor's Tennis Court Engineer shall specify, review and approve the concrete mix design for the tennis court. The mix approved by the Tennis Court Engineer shall be submitted to the Architect for consideration. The mix design shall include the 28 day compressive strength, aggregate gradation requirements, slump range permitted, water/cement ratio, aggregate size limits, air entraining agent, fly ash content, type of fly ash used, and admixture data. It is acceptable to the Architect if the Contractor's Tennis Court Engineer allows use of the Specification Section 03 3000 mix design for "Exterior Slabs over Void Boxes and Exterior Slabs over any other Temporary Formwork".

### **2.05 SOURCE QUALITY CONTROL**

- A. A Special Inspection and Testing Agency (SITA) will perform source quality control tests and inspections, as specified in Sections 01 4516 and 01 4533.

## **PART 3 EXECUTION**

### **3.01 INSTALLERS**

- A. Substitutions: Not permitted.

### **3.02 EXAMINATION**

- A. Verify that site conditions are ready to receive work and field measurements are as indicated on Drawings.

### **3.03 FORMWORK ERECTION**

- A. Construct and support formwork in accordance with Section 03 1000.
- B. Provide supports and working space for tensioning jacks.
- C. Install anchorage and connection devices.

### **3.04 TENDON PLACEMENT**

- A. Install tendons according to approved installation drawings and procedures stated in PTI's "Field Procedures Manual for Unbonded Single Strand Tendons."
- B. Tendon Supports: Provide continuous slab bolsters or bars supported on individual high chairs spaced at a maximum of 42 inches (1070 mm) o.c. to ensure tendons remain in their designated positions during construction operations and concrete placement.
  - 1. Support tendons as required to provide profiles shown on installation drawings. Position supports at high and low points and at intervals not exceeding 48 inches (1220 mm). Ensure that tendon profiles between high and low points are smooth parabolic curves.
  - 2. Attach tendons to supporting chairs and reinforcement without damaging tendon sheathing.
  - 3. Support slab tendons independent of beam reinforcement.
- C. Maintain tendon profile within maximum allowable deviations from design profile as follows:
  - 1. 1/4 inch (6.3 mm) for member depth less than or equal to 8 inches (200 mm).
  - 2. 3/8 inch (10 mm) for member depth greater than 8 inches (200 mm) and less than or equal to 24 inches (610 mm).
  - 3. 1/2 inch (13 mm) for member depth greater than 24 inches (610 mm).
- D. Maintain minimum radius of curvature of 480-strand diameters for lateral deviations to avoid openings, ducts, and embedded items. Maintain a minimum of 2 inches (50 mm) of separation between tendons at locations of curvature.
- E. Limit tendon bundles to five tendons. Do not twist or entwine tendons within a bundle. Maintain a minimum distance of 12 inches (300 mm) between center of adjacent bundles.
- F. If tendon locations conflict with non-prestressed reinforcement or embedded items, tendon placement governs unless changes are authorized in writing by Architect. Obtain Architect's approval before relocating tendons or tendon anchorages that interfere with one another.
- G. Deviations in horizontal spacing and location of slab tendons are permitted when required to avoid openings and inserts.
- H. Installation of Anchorage Devices:
  - 1. Place anchorage devices at locations shown on approved installation drawings.
  - 2. Attach pocket formers, intermediate anchorage devices, and stressing-end anchorage devices securely to bulkhead forms. Install stressing-end and intermediate anchorage devices perpendicular to tendon axis.
  - 3. Install tendons straight, without vertical or horizontal curvature, for a minimum of 12 inches (300 mm) behind stressing-end and intermediate anchorages.
  - 4. Embed intermediate anchorage devices at construction joints in first concrete placed at joint.
  - 5. Minimum splice length in reinforcing bars at anchorages is 24 inches (600 mm). Stagger splices a minimum of 60 inches (1500 mm).

6. Place fixed-end anchorage devices in formwork at locations shown on installation drawings. Support anchorages firmly to avoid movement during concrete placement.
- I. Maintain minimum concrete cover as follows:
  1. From Exterior Edge of Concrete to Wedge Cavity: 2 inches (50 mm).
  2. From Exterior Edge of Concrete to Strand Tail: 3/4 inch (19 mm).
  3. Top, Bottom, and Edge Cover for Anchorage Devices: 1-1/2 inches (38 mm).
- J. Maintain minimum clearance of 6 inches (150 mm) between tendons and openings.
- K. Prior to concrete placement, mark tendon locations on formwork with spray paint.
- L. Do not install sleeves within 36 inches (914 mm) of anchorages after tendon layout has been inspected unless authorized in writing by Architect.
- M. Do not install conduit, pipe, or embeds requiring movement of tendons after tendon layout has been inspected unless authorized in writing by Architect.
- N. Do not use couplers unless location has been approved by Architect.
- O. Secure jack pressure plates in position perpendicular to line of stressing force.

### **3.05 PLACING CONCRETE**

- A. Place concrete in accordance with Section 03 3000.
- B. Verify tendons, anchors, seats, plates, and other items to be cast into concrete are placed and secure.
- C. Tolerances:
  1. See Section 03 1000 for formwork construction tolerances.

### **3.06 TENSIONING**

- A. Perform tensioning after concrete has reached 75% of its compressive strength and ambient temperature is above specified requirements, in two steps.
- B. Confirm concrete strength with test cylinders prior to tensioning.
- C. Measure prestressing force. Maintain jacking and tensioning records as work progresses and submit to the engineer within 48 hours.
- D. Jack against tendon pressure plate, not against concrete.
  1. Stress by means of hydraulic jacks equipped with accurate reading calibrated hydraulic pressure gages to permit the stress in a prestressing steel to be computed at all times.
  2. Provide a certified calibration curve with each jack. If inconsistencies occur between the jack gage and the measured elongation, immediately recalibrate the jack gage.
  3. Anchor the prestressing steel at an initial or anchor force of stress that will result in the ultimate retention of the working or effective force or stress shown on the Shop Drawings.
    - a. In no case may the steel be tensioned above 80% of the ultimate strength of the wire, strand, or bars.
    - b. Do not permit the anchor force to exceed 70% of the ultimate strength of the stand.
  4. Do not permit the field readings of elongations and/or stressing forces to vary more than 7% from calculated required values.
  5. Drape to the configuration shown on the Shop Drawings.
  6. Do not permit twisting or entwining of individual wires or strands within a bundle or beam.
    - a. Secure the approval of the Architect and governmental agencies having jurisdiction on each item of anchoring, coupling, and miscellaneous hardware.
    - b. Design such items to provide for the full strength of the tendons and also to provide for stressing at the concrete strength shown on the Drawings.
  7. Secure the tendons to a sufficient number of positioning devices to assure correct location during and after placement of concrete, but support at a maximum of 4' - 0" on centers.
- E. Stress slab tendons before stressing beam tendons.

- F. Where pockets are required for anchorage, adequately reinforce so as to not decrease the strength of the structure. Except as otherwise approved by the Architect, waterproof the pockets to eliminate leakage of water.
- G. Slight deviations in the spacing of slab tendons will be permitted when required to avoid openings, inserts, and dowels which are specifically located. Where locations of tendons appear to interfere with each other, one tendon may be moved horizontally in order to avoid the interference.
- H. Inserts and sleeves:
  - 1. Use cast-in-place wherever practicable.
  - 2. Drilled or powder-driven fasteners will be permitted when it can be shown that the inserts will not spall the concrete, and when the inserts are located so as to avoid the tendons and anchorages.
- I. Cut off excess tendon between 1/2" and 3/4" from wedges. Apply touch-up primer to cut end.

### **3.07 FIELD QUALITY CONTROL**

- A. A Special Inspection and Testing Agency (SITA) will perform field quality control tests and inspections, as specified in Sections 01 4516 and 01 4533.

### **3.08 REMOVAL OF FORMS**

- A. See Section 03 1000 for requirements for removal of forms.
- B. Do not remove forms, shores, and bracing until concrete has been tensioned to strength sufficient to carry its own weight, construction loads, and design loads.

### **3.09 REPAIR OF SURFACE DEFECTS**

- A. Repair surface defects in accordance with Section 03 3000.
- B. Request examination of concrete surfaces upon removal of forms.
- C. Modify or repair concrete not complying with required lines, detail, and elevations.
- D. Modify or repair concrete not properly placed, resulting in honeycombing or other defects.

**END OF SECTION**

**SECTION 04 0100  
MAINTENANCE OF MASONRY**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Final cleaning of masonry surfaces.
- B. Replacement of masonry units.
- C. Repointing mortar joints.
- D. Repair of damaged masonry.

**1.02 RELATED REQUIREMENTS**

- A. Section 04 0511 - Masonry Mortaring and Grouting.
- B. Section 04 2000 - Unit Masonry: Brick and Block masonry units.
- C. Section 04 4313 - Stone Masonry Veneer.
- D. Section 04 7200 - Cast Stone Masonry.

**1.03 REFERENCE STANDARDS**

- A. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures 2022, with Errata.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene one week prior to commencing work of this section.
  - 1. Require attendance of parties directly affecting work of this section.
  - 2. Review conditions of installation, installation procedures, and coordination with related work.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on cleaning compounds and cleaning solutions.
  - 1. Cleaning Plan: Written description of cleaning process, including materials, methods, equipment, and sequencing of work.
- C. Applicator Qualifications: Submit qualifications of applicator.
  - 1. Certification stating applicator is experienced in the application of the specified products.
  - 2. List of recently completed masonry cleaning projects, including project name and location, names of owner and architect, description of cleaning products used and substrates, applicable local environmental regulations, and application procedures.
- D. Environmental Regulations: Submit description for testing, handling, treatment, containment, collection, transport, disposal, and discharge of hazardous wastes and cleaning effluents. Describe any hazardous materials to be cleaned from substrates. Submit applicable local environmental regulations.
- E. Protection: Submit description for protecting surrounding areas, landscaping, building occupants, pedestrians, vehicles, and non-masonry surfaces during the work from contact with masonry cleaners, residues, rinse water, fumes, wastes, and cleaning effluents.
- F. Surface Preparation: Submit description for surface preparation of substrates to be completed before application of masonry cleaners.
- G. Application: Submit description for application procedures of masonry cleaners.

**1.06 QUALITY ASSURANCE**

- A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.
- B. Manufacturer Qualifications:

1. Manufacturer capable of providing field service representation during installation and who will approve the installer and application method.
- C. Installer Qualifications:
  1. Installer experienced in performing this type of work and who has specialized in work similar to the type required for this project.
- D. Pre-installation Meetings
  1. Comply with provisions of Section 01 3000 - Administrative Requirements.
    - a. Applicator and Product representative shall be present during meeting.

#### **1.07 MOCK-UP**

- A. Test Panels:
  1. Before full-scale application, test products to be used on test panels.
  2. Review manufacturer's product data sheets to determine suitability of each product for each surface.
  3. Apply products using manufacturer-approved application methods, determining actual requirements for application.
  4. After 48 hours, review effectiveness of cleaning or treatment, compatibility with substrates, and ability to achieve desired results.
  5. Obtain approval by Architect and Owner of workmanship, color, and texture before proceeding with work.
  6. Test Panels: Inconspicuous sections of actual construction.
    - a. Location and number as selected by Architect.
    - b. Size; 4 feet by 4 feet.
    - c. Repair unacceptable work to the satisfaction of the Architect and Owner.
- B. Acceptable panel and procedures employed will become the standard for work of this section.
- C. Mock-up may remain as part of the Work.

#### **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver masonry neatly stacked and tied on pallets. Store clear of ground with adequate waterproof covering.
- B. Store cleaning materials in manufacturer's packaging.

#### **1.09 FIELD CONDITIONS**

- A. Do not apply products under conditions outside manufacturer's requirements, which include:
  1. Surfaces that are frozen; allow complete thawing prior to installation.
  2. Surface and air temperatures below 40 degrees F.
  3. Surface and air temperatures above 95 degrees F.
  4. When surface or air temperature is not expected to remain above 40 degrees F for at least 8 hours after application.
  5. Wind conditions that may blow materials onto surfaces not intended to be treated.
  6. Less than 24 hours after a rain or 6 hours before rain is expected after installation.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Restoration and Cleaning Chemicals:
  1. Diedrich Technologies, Inc: [www.diedrichtechnologies.com/#sle](http://www.diedrichtechnologies.com/#sle).
  2. PROSOCO: [www.prosoco.com](http://www.prosoco.com).
  3. Substitutions: See Section 01 6000 - Product Requirements.

#### **2.02 CLEANING MATERIALS**

- A. Water: Clean, potable, and free of oils, acids, alkalis, salts, and organic matter. Use to rinse masonry surfaces and dilute concentrated cleaners.
- B. Cleaning Agent: Product types listed are manufactured by Prosoco, inc. as basis of design.

MATERIAL	COLOR/TEXTURE	CLEANER
Brick	Red	600 Detergent
	Light	Vana Trol
	Dark	Vana Trol
	Pavers	600 Detergent
	Glazed	Vana Trol
CMU	Split Face	Custom Masonry Cleaner
	Burnished/Ground Face	Light Duty Concrete Cleaner
Cast Stone	Integral Color	Light Duty Concrete Cleaner
Architectural Concrete	Natural Color	Light Duty Concrete Cleaner
	Textured	Heavy Duty Concrete Cleaner

### 2.03 MORTAR MATERIALS

- A. Comply with requirements of Section 04 0511.

### 2.04 MASONRY MATERIALS

- A. Unit Masonry: Section 04 2000.
- B. Cast Stone Masonry: Section 04 7200
- C. Stone Veneer: Section 04 4313.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that surfaces to be cleaned and restored are ready for work of this section.
- B. Do not begin until test panels have been approved by Architect.

### 3.02 PREPARATION

- A. Protect surrounding elements from damage due to restoration procedures.
- B. Carefully remove and store removable items located in areas to be restored, including fixtures, fittings, finish hardware, and accessories; reinstall upon completion.
- C. Separate areas to be protected from restoration areas using means adequate to prevent damage.
- D. Cover existing landscaping with tarpaulins or similar covers.
- E. Mask immediately adjacent surfaces with material that will withstand cleaning and restoration procedures.
- F. Close off adjacent occupied areas with dust proof and weatherproof partitions.
- G. Protect roof membrane and flashings from damage with 1/2 inch plywood laid on roof surfaces over full extent of work area .
- H. When using cleaning methods that involve water or other liquids, install drainage devices to prevent runoff over adjacent surfaces unless those surfaces are impervious to damage from runoff.
- I. Do not allow cleaning runoff to drain into sanitary or storm sewers.

### 3.03 REBUILDING

- A. Cut out damaged and deteriorated masonry with care in a manner to prevent damage to any adjacent remaining materials.
- B. Support structure as necessary in advance of cutting out units.
- C. Cut away loose or unsound adjoining masonry and mortar to provide firm and solid bearing for new work.

- D. Build in new units following procedures for new work specified in other section(s).
- E. Mortar Mix: Colored and proportioned to match existing work.
- F. Ensure that anchors, ties, reinforcing, and flashings are correctly located and built in.
- G. Install built in masonry work to match and align with existing, with joints and coursing true and level, faces plumb and in line. Build in all openings, accessories and fittings.

### **3.04 REPOINTING**

- A. Perform repointing prior to cleaning masonry surfaces.
- B. Cut out loose or disintegrated mortar in joints to minimum 1/2 inch depth or until sound mortar is reached.
- C. Use power tools only after test cuts determine no damage to masonry units will result.
- D. Do not damage masonry units.
- E. When cutting is complete, remove dust and loose material by brushing.
- F. Premoisten joint and apply mortar. Pack tightly in maximum 1/4 inch layers. Form a smooth, compact concave joint to match existing.
- G. Moist cure for 72 hours.

### **3.05 CLEANING OF MASONRY**

- A. Comply with provisions of Section 01 7000 - Execution and Closeout Requirements.
- B. Clean all exposed surfaces of new masonry of excess mortar, efflorescence, stains, and job dirt, using materials specified.
- C. Clean from top down; prevent cleaning materials and rinse water from contacting non-cementitious materials.
- D. Clean in accordance with manufacturer's instructions and recommendations, product data, and container label instructions.
- E. Mix materials in strict accordance with manufacturer's instructions; do not dilute unless permitted by manufacturer.
- F. Prevent overspray, wind drift, and splash onto surfaces not to be treated.
- G. No high pressure washers are allowed.
- H. Low pressure spray for wetting and rinsing is permitted. Pressure should be in the range of 400-700 psi. Equipment should produce 4-6 gallons of water per minute using a 15-40 degree fan tip (no fan tip less than a 15-degree is allowed).

### **3.06 AGING**

- A. Rub in new masonry work to match, as close as possible, adjacent original work.
  - 1. Use carbon black in small amounts, rubbing in well with burlap rags.
- B. After each application, dust off surplus and wash down with low pressure hose. Allow surface to dry before proceeding with succeeding applications.
- C. Continue process until acceptance.

### **3.07 FIELD QUALITY CONTROL**

- A. Inspection:
  - 1. Inspect the masonry cleaning work with the Contractor, Architect, applicator, and product representative, and compare with test panel results approved by the Architect. Determine if the substrates are suitably clean.
- B. Manufacturers' Field Services
  - 1. Provide the services of the manufacturer's authorized field representative to verify that installed products comply with manufacturer's requirements and with the standard established by the Architect-approved test panels.



### **3.08 CLEANING**

- A. Immediately remove stains, efflorescence, or other excess resulting from the work of this section.
- B. Remove excess mortar, smears, and droppings as work proceeds and upon completion.
- C. Clean surrounding surfaces.
- D. Repair, restore, or replace to the satisfaction of the Architect, all materials, landscaping, and non-masonry surfaces damaged by exposure to the cleaning process.

**END OF SECTION**



**SECTION 04 0511**  
**MASONRY MORTARING AND GROUTING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Mortar for masonry.
- B. Grout for masonry.

**1.02 RELATED REQUIREMENTS**

- A. Section 04 0100 - Maintenance of Masonry: Bedding and pointing mortar for masonry restoration work.
- B. Section 04 2000 - Unit Masonry: Installation of mortar and grout.
- C. Section 04 7200 - Cast Stone Masonry: Installation of mortar.

**1.03 REFERENCE STANDARDS**

- A. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures 2022, with Errata.
- B. ASTM C5 - Standard Specification for Quicklime for Structural Purposes 2018.
- C. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete 2023.
- D. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar 2018.
- E. ASTM C150/C150M - Standard Specification for Portland Cement 2022.
- F. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes 2018.
- G. ASTM C270 - Standard Specification for Mortar for Unit Masonry 2019a, with Editorial Revision.
- H. ASTM C387/C387M - Standard Specification for Packaged, Dry, Combined Materials for Concrete and High Strength Mortar 2023.
- I. ASTM C404 - Standard Specification for Aggregates for Masonry Grout 2018.
- J. ASTM C476 - Standard Specification for Grout for Masonry 2023.
- K. ASTM C780 - Standard Test Methods for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry 2023.
- L. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete 2016.
- M. ASTM C1019 - Standard Test Method for Sampling and Testing Grout for Masonry 2020.
- N. ASTM C1072 - Standard Test Methods for Measurement of Masonry Flexural Bond Strength 2022.
- O. ASTM C1148 - Standard Test Method for Measuring the Drying Shrinkage of Masonry Mortar 1992a (Reapproved 2014).
- P. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms 2023a.
- Q. ASTM E514/E514M - Standard Test Method for Water Penetration and Leakage Through Masonry 2020.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Include design mix and indicate whether the Proportion or Property specification of ASTM C270 is to be used.
  - 1. Where a water repellent admixture is specified, submit documentation showing that water repellent admixture is compatible with the water repellent used by the masonry brick/block manufacturer.
- C. Samples: Submit two samples of mortar, illustrating mortar color and color range.

- D. Reports: Submit reports on mortar indicating compliance of mortar to property requirements of ASTM C270 and test and evaluation reports per ASTM C780.
- E. Reports: Submit reports on grout indicating conformance of component grout materials to requirements of ASTM C476 and test and evaluation reports to requirements of ASTM C1019 and ASTM C939.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- G. Manufacturer's Installation Instructions: Submit packaged dry mortar manufacturer's installation instructions, if packaged dry mortars are used.

#### **1.05 QUALITY ASSURANCE**

- A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.
  - 1. Maintain one copy of each document on project site.

#### **1.06 PRECONSTRUCTION TESTING**

- A. Testing will be conducted by an independent test agency, in accordance with provisions of Section 01 4000 - Quality Requirements.
- B. Mortar Mixes: Test mortars prebatched by weight in accordance with ASTM C780 recommendations for preconstruction testing.
  - 1. Test results will be used to establish optimum mortar proportions and establish quality control values for construction testing.
- C. Grout Mixes: Test grout batches in accordance with ASTM C1019 procedures.
  - 1. Test results will be used to establish optimum grout proportions and establish quality control values for construction testing.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

#### **1.08 FIELD CONDITIONS**

- A. Temperature and Humidity
  - 1. During cold weather construction do not lay masonry units unless the temperature is 40 degrees Fahrenheit and rising.
  - 2. During hot weather construction (ambient air temperature exceeds 100 degrees Fahrenheit or 90 degrees Fahrenheit with wind velocity greater than 8 mph) do not spread mortar beds more than 4 feet ahead of masonry and set brick masonry within 1 minute of spreading mortar. Fog spray cure twice daily at four hour intervals for three days during hot weather.
  - 3. Protect masonry construction from direct exposure to wind and sun when erected in ambient air temperature of greater than 99 degrees Fahrenheit in the shade, with relative humidity less than 50 percent.
  - 4. During hot weather protect brick masonry units from sun until units are ready to be placed in the wall.

### **PART 2 PRODUCTS**

#### **2.01 MORTAR AND GROUT APPLICATIONS**

- A. At Contractor's option, mortar and grout may be field-mixed from packaged dry materials or made from factory premixed dry materials with addition of water only.
- B. Mortar Color: Natural gray unless otherwise indicated.
  - 1. Where colored mortar is specified it is recommended that factory premixed mortar be used. Mortar color shall be consistent throughout the project with the sample produced and approved on the mock-up wall.
- C. Mortar Mix Designs: ASTM C270, Proportion Specification.

1. Masonry below grade and in contact with earth: Type S.
2. Exterior Masonry Veneer: Type N.
3. Exterior, Loadbearing Masonry: Type N.
4. Exterior, Non-loadbearing Masonry: Type N.
5. Exterior Repointing Mortar: Type N with maximum 2 percent ammonium stearate or calcium stearate per cement weight.
6. Interior, Loadbearing Masonry: Type N.
7. Interior, Non-loadbearing Masonry: Type N.
8. Pointing Mortar for Prefaced or Specially Faced Unit Masonry: One part Portland cement, 1/8 part hydrated lime, and two parts graded (80 mesh) aggregate, proportioned by volume. Add aluminum tristearate, calcium stearate, or ammonium stearate equal to 2 percent of Portland cement by weight.
9. Glass Unit Masonry: Type N mortar and Type O pointing mortar.

D. Grout Mix Designs:

1. Refer to Contract Documents for grout strength and slump requirements. Provide premixed or job mixed grout in accordance with ASTM C94/C94M. It is permitted to provide fine or coarse grout in accordance with the table below:

Grout Type	Maximum Grout Pour Height	Minimum Clear Width of Grout Space	Minimum Clear Grout Space Dimensions for Grouting Cells of Hollow Units
Fine	1'-0"	3/4"	1 1/2" x 2"
	5'-0"	2"	2" x 3"
	12'-0"	2 1/2"	2 1/2" x 3"
	24'-0"	3"	3" x 3"
Coarse	1'-0"	1 1/2"	1 1/2" x 3"
	5'-0"	2"	2 1/2" x 3"
	12'-0"	2 1/2"	3" x 3"
	24'-0"	3"	3" x 4"

2. Grout shall be poured in maximum lift heights (increment of grout height within a pour height) and maximum grout heights (total height of masonry to be poured prior to the erection of additional masonry) noted below:
  - a. Grout in partially grouted walls shall be placed in pour heights equal to the bond beam spacing not to exceed 5'-4". Pour heights are permitted to be increased up to 12'-8" provided the following conditions are met:
    - 1) The masonry has cured for a minimum of 4 hours.
    - 2) Grout slump is maintained between 10 in and 11 in.
    - 3) No intermediate reinforced bond beams are placed between the top and the bottom of the pour height.
  - b. Grout in fully grouted walls are permitted to be poured per the maximum pour heights provided in the table above. Lift heights shall not exceed 5'-4" except that it permitted to increase lift heights to 12'-8" provided the following conditions are met:
    - 1) The masonry has cured for a minimum of 4 hours.
    - 2) Grout slump is maintained between 10 in and 11 in.
  - c. Grout in lintel beams shall be placed in lift heights equal to the full depth of the beam unless noted otherwise.

## 2.02 MATERIALS

- A. Packaged Dry Material for Mortar for Unit Masonry: Premixed Portland cement, hydrated lime, and sand; complying with ASTM C387/C387M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.
  1. Color: Mineral pigments added as required to produce approved color sample.

- B. Packaged Dry Material for Grout for Masonry: Premixed cementitious materials and dried aggregates; capable of producing grout of the specified strength in accordance with ASTM C476 with the addition of water only.
- C. Portland Cement: ASTM C150/C150M.
  - 1. Type: Type I - Normal; ASTM C150/C150M.
  - 2. Color: Color as required to produce approved color sample.
- D. Hydrated Lime: ASTM C207, Type S.
- E. Quicklime: ASTM C5, non-hydraulic type.
- F. Mortar Aggregate: ASTM C144.
- G. Grout Aggregate: ASTM C404.
- H. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
  - 1. Pigment:
    - a. Face Brick: Natural Gray
    - b. Brick Pool Coping: Match Brick
    - c. Architectural CMU: Match Unit
    - d. Cast Stone/CSMU: Match Unit
    - e. Existing Construction: Match existing mortar color.
  - 2. Manufacturers:
    - a. Quikrete Companies: [www.quikrete.com](http://www.quikrete.com)
    - b. Amerimix, an Oldcastle brand, Bonsal American: [www.amerimix.com](http://www.amerimix.com)
    - c. TXI: [www.txi.com](http://www.txi.com).
    - d. Substitutions: See Section 01 6000 - Product Requirements.
- I. Water: Clean and free from deleterious acids, alkalis, and organic matter.
- J. Integral Water Repellent Admixture: Polymeric liquid or powder admixture added to mortar at the time of manufacture.
  - 1. Performance of Mortar with Integral Water Repellent:
    - a. Water Permeance: When tested per ASTM E514/E514M and for a minimum of 72 hours:
      - 1) No water visible on back of wall above flashing at the end of 24 hours.
      - 2) No flow of water from flashing equal to or greater than 0.032 gallons per hour at the end of 24 hours.
      - 3) No more than 25 percent of wall area above flashing visibly damp at end of test.
    - b. Flexural Bond Strength: ASTM C1072; minimum 10 percent increase.
    - c. Compressive Strength: ASTM C1314; maximum 5 percent decrease.
    - d. Drying Shrinkage: ASTM C1148; maximum 5 percent increase in shrinkage.
  - 2. Required only at all single wythe exterior masonry wall applications and in conjunction with hollow brick used on the back of parapet walls.
  - 3. At single wythe exterior concrete masonry, water repellent admixture shall be compatible with the water repellent used by the masonry unit manufacturer.

### 2.03 MORTAR MIXING

- A. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM C270 and in quantities needed for immediate use.
  - B. Maintain sand uniformly damp immediately before the mixing process.
  - C. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio; mix in accordance with manufacturer's instructions, uniform in coloration.
  - D. No Admixtures are allowed except water repellents where required.
  - E. Do not use anti-freeze compounds to lower the freezing point of mortar.
-

- F. If water is lost by evaporation, re-temper only within two hours of mixing.

## **2.04 GROUT MIXING**

- A. Mix grout in accordance with ASTM C94/C94M.
- B. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C476 for fine and coarse grout.
- C. No Admixtures are allowed except water repellents where required.
- D. Do not use anti-freeze compounds to lower the freezing point of grout.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Plug clean-out holes for grouted masonry with matching masonry units. Brace masonry to resist wet grout pressure.

### **3.02 INSTALLATION**

- A. Contractor shall note that the dimensions shown on the floor plans and plan details are in some instances nominal masonry dimensions. The contractor is responsible for coordinating the masonry layout to provide 3/8" joints. If conflict occurs, contractor shall contact Architect prior to installing masonry.
- B. Site Verification of Conditions
  - 1. Examine the area and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
  - 2. Verify that wall ties, and reinforcement are properly located.
  - 3. Verify that flashings are properly located and intact.
- C. Mortar and Grout
  - 1. Head joints: Regardless of thickness, completely fill with mortar or grout. Do not slush full.
  - 2. Except at the finishing course, stop grout approximately 1" below the top of the last course.
  - 3. At the finishing course, bring the last grout pour flush with the top of the brick.
  - 4. Whenever possible, grout from the inside face of the masonry.
  - 5. Take extreme care to prevent grout or mortar staining the face of masonry to be left exposed or unpainted.
  - 6. Protect sills, ledges, offsets, door jambs, corners, and similar points from damage and from collecting mortar or grout.
  - 7. Immediately remove mortar and grout from areas where they are not scheduled to be placed.
  - 8. All mortar shall be hard and durable after curing. Scratchable mortar is not acceptable.
  - 9. Perform grouting in strict accordance with the provisions of the Building Code.
  - 10. Solidly fill vertical cells containing reinforcement.
  - 11. Consolidate grout at time of pour by puddling with a mechanical vibrator, filling all cells of the masonry, and then reconsolidating later by puddling before the plasticity is lost.
- D. Install mortar and grout to requirements of section(s) in which masonry is specified.
- E. Work grout into masonry cores and cavities to eliminate voids.
- F. Do not install grout in lifts greater than 16 inches without consolidating grout by rodding.
- G. Do not displace reinforcement while placing grout.
- H. Remove excess mortar from grout spaces.

**3.03 FIELD QUALITY CONTROL**

- A. A Special Inspection and Testing Agency (SITA) will perform field quality control tests and inspections, as specified in Sections 01 4516 and 01 4533.

**END OF SECTION**



**SECTION 04 2000  
UNIT MASONRY**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Standard Concrete Masonry Units.
- B. Architectural Concrete Masonry Units
- C. Clay facing brick.
- D. Reinforcement and anchorage.
- E. Flashings.
- F. Lintels.
- G. Accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 2000 - Concrete Reinforcing: Reinforcing steel for grouted masonry.
- B. Section 04 0100 - Maintenance of Masonry.
- C. Section 04 0511 - Masonry Mortaring and Grouting.
- D. Section 05 5000 - Metal Fabrications: fabricated steel items.
- E. Section 06 1000 - Rough Carpentry: Nailing strips built into masonry.
- F. Section 07 2100 - Thermal Insulation: Insulation for cavity spaces.
- G. Section 07 2500 - Weather Barriers: Water-resistive barriers or air barriers applied to the exterior face of the backing sheathing or masonry.
- H. Section 07 6200 - Sheet Metal Flashing and Trim: Metal through-wall masonry flashings.
- I. Section 07 8400 - Firestopping: Firestopping at penetrations of fire-rated masonry and at top of fire-rated walls.
- J. Section 07 9200 - Joint Sealants: Sealing control and expansion joints.

**1.03 REFERENCE STANDARDS**

- A. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units 2016a.
- B. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units 2017.
- C. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale) 2017a.
- D. BIA Technical Notes No. 13 - Ceramic Glazed Brick Exterior Walls 2017.
- E. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures 2016.
- F. NCMA TEK 19-7 - Characteristics of Concrete Masonry Units with Integral Water Repellent, 2008
- G. UL (FRD) - Fire Resistance Directory Current Edition.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-installation Meetings
  - 1. Comply with provisions of Section 01 3000 - Administrative Requirements.

2. Not less than one week prior to commencing all masonry related items a pre-installation conference shall be held at the site. Attendance is mandatory for all trades affected by this section. The general contractor shall be responsible for coordinating this conference with all affected trades (Including but not limited to jobsite superintendent, masonry contractor, masonry foreman, waterproofing and flashing contractor, concrete block insulator and architect). The architect will conduct the business of this meeting. All masonry work that takes place prior to this conference shall be marked as rejected and shall be removed, no exceptions.

#### **1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.
- C. Shop Drawings: Indicate pertinent dimensions, materials, anchorage, masonry reinforcement, size and type of fasteners, and accessories for brick/blockwork support system.
- D. Samples: Submit four samples of facing brick and architectural masonry units to illustrate color, texture, and extremes of color range. Sample shall be of actual unit specified to be installed.
- E. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

#### **1.06 QUALITY ASSURANCE**

- A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.
  1. Maintain one copy of each document on project site.
- B. At all units (concrete masonry, stone, cast stone or other) for which an integral water repellent was specified to be in the units, perform the Water Droplet Test as recommended in the performance criteria of NCMA TEK 19-7 associated with the Water Droplet Test Method.
- C. Certifications
  1. Do not commence placement of masonry until mortar mix designs have been reviewed and approved by the Testing Laboratory and all governmental agencies having jurisdiction and until copies are at the job site.

#### **1.07 MOCK-UP**

- A. Field Sample (Panels for texture and color approvals only)
  1. In an area on the site where approved by the Architect, provide sample masonry panels.
    - a. Make each sample panel approximately 4'-0" high and 6'-0" long.
    - b. Provide one sample panel for each combination of masonry units, bond pattern, mortar color, and joint type used in the Work.
    - c. For renovation projects, locate panel adjacent to existing building to allow side by side viewing of both existing building and panel. Panel shall be located in an area that receives both direct sun and shade.
    - d. Revise as necessary to secure approval from Owner and Architect.
    - e. Completely demolish and remove from the job site upon completion and acceptance of the work.
- B. Mock-Ups (Wall for quality control purposes)
  1. A mock-up wall shall be constructed no site only after the pre-installation conference as specified in Section 01 4339-Mock-Up Wall Construction.
  2. Installation of all materials and products into the wall shall be in accordance with all applicable specifications as noted in the project manual and as shown on the drawings.
  3. No work shall proceed until the mock-up wall is approved.

#### **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

- B. All masonry products stored on site shall be properly covered from the weather to prevent deterioration and moisture penetration. Broken or damaged masonry products shall be rejected. Do not double-stack pallets.
- C. Storage and protection of masonry embedded flashing;
  - 1. Comply with manufacturer's recommendations for storage and handling of each product.
  - 2. Wall Flashing and Surface Conditioner shall be delivered in the original, unopened manufacturer's containers with all labeling information fully visible.
  - 3. On-Site Storage of unopened cartons shall be such that the material is kept dry and is not stored at temperatures in excess of 100 deg. F. Pallets of cartons should not be double stacked for on-site storage.
  - 4. Surface Conditioner is non-flammable. Refer to product label before use.
- D. Acceptance at Site
  - 1. Deliver materials in manufacturer's unopened containers, fully identified with name, brand, type, and grade.
  - 2. Materials with missing or illegible identification shall be rejected.

## **PART 2 PRODUCTS**

### **2.01 CONCRETE MASONRY UNITS**

- A. Manufacturers:
  - 1. Best Block: [www.bestblock.com](http://www.bestblock.com)
  - 2. Boral Concrete Products: [www.boralconcreteproducts.com](http://www.boralconcreteproducts.com)
  - 3. Oldcastle Architectural, Jewell Concrete Products: [www.jewellcp.com](http://www.jewellcp.com).
  - 4. Spectra Development Corporation: [www.spectraglaze.com](http://www.spectraglaze.com).
  - 5. Texas Building Products, Inc.: [www.texasbuildingproducts.com](http://www.texasbuildingproducts.com).
  - 6. Trenwyth Industries, Inc.: [www.echelonmasonry.com](http://www.echelonmasonry.com).
  - 7. Substitutions: See Section 01 6000 - Product Requirements.
- B. Standard Concrete Masonry Units: Comply with referenced standards and as follows:
  - 1. Size: Standard units with nominal face dimensions of 16 by 8 inches and nominal depths as indicated on drawings for specific locations.
  - 2. Special Shapes: Provide non-standard blocks configured for corners, lintels, headers, control joint edges, and other detailed conditions.
  - 3. Use bullnose type concrete masonry units at all edges, exterior corners, jamb and sill conditions.
  - 4. Load Bearing/Non-Load Bearing Units: ASTM C90, lightweight.
  - 5. Load-Bearing Units/ Non-Loadbearing Units: ASTM C90, normal weight
    - a. Provide at all sound wall locations unless noted otherwise.
  - 6. 4" wide units shall be provided as hollow cell units.
- C. Architectural Concrete Masonry Units: Comply with referenced standards and as follows:
  - 1. Provide Architectural Concrete Masonry units as shown on the drawings and defined as Ground Face, Polished or other variations of these units.
    - a. Where "Polished" Units are called out on the drawings, units shall be filled with a cementitious grout and polished smooth in a multi-stage polishing process after the initial "ground face" procedure. Provide polished on two faces where shown on drawings.
  - 2. Architectural Concrete Masonry Units shall be made from natural and manufactured aggregates, cement and color. The manufacturer shall exercise extreme care in the manufacturing process to minimize these variations in size, shape, texture and particle color so that the completed product will match the approved samples and mockup. The manufacturer shall use the finest materials available, but some variation in color and texture will be acceptable to the extent the approved samples and mockup exhibit variation.

3. Size: Standard units with nominal face dimensions and nominal depths as indicated on the drawings for specific locations.
4. Special Shapes: Provide special shapes for lintels, corners, jambs, sash, control joints, headers, bonding, water table, and other special conditions.
5. Provide square-edged units for outside corners.
6. Color: Refer to section 01 6210, Schedule of Colors.
7. Load-Bearing Units: ASTM C90, lightweight.
8. Non-Loadbearing Units: ASTM C129, lightweight.
9. All units shall contain a manufacturer approved integral water repellent CMU admixture at the time of manufacture. The Contractor shall comply with all of the recommended specifications for performance criteria provided in NCMA TEK 19-7 that are associated with the use of the Water Droplet Test as the method of quality assurance.
10. Apply sealer to all interior Ground Face Masonry as specified in section 07 1900, Water Repellents.

## **2.02 BRICK UNITS**

- A. Manufacturers:
  1. Acme Brick Company: [www.brick.com](http://www.brick.com)
  2. Elgin Butler Company: [www.elginbutler.com](http://www.elginbutler.com).
  3. Endicott Clay Products Co: [www.endicott.com](http://www.endicott.com).
  4. General Shale Brick: [www.generalshale.com](http://www.generalshale.com).
  5. Meridian Brick LLC : [www.meridianbrick.com/#sle](http://www.meridianbrick.com/#sle).
  6. Interstate Brick: [www.interstatebrick.com](http://www.interstatebrick.com)
  7. Sioux City Brick: [www.siouxcitybrick.com](http://www.siouxcitybrick.com)
  8. Summit Brick: [www.summitbrick.com](http://www.summitbrick.com)
  9. Kansas Brick and Tile/Cloud Ceramics: [www.kansasbrick.com](http://www.kansasbrick.com)
  10. Substitutions: See section 01 6000 - Product Requirements.
- B. Facing Brick: ASTM C216, Type FBS Smooth, Grade SW.
  1. Color and texture: Refer to Schedule of Materials and Colors.
  2. Nominal size: Utility.
  3. Special shapes: Provide special shapes at all intersections not equal to 90 degrees to conform to the brick selected or of the same type and finish in the brick allowance. Where solid brick are noted on the plans, provide brick of appropriate size without cores.
  4. Compressive strength: As measured in accordance with ASTM C67.

## **2.03 MORTAR AND GROUT MATERIALS**

- A. Mortar and Grout: As specified in Section 04 0511.

## **2.04 REINFORCEMENT AND ANCHORAGE**

- A. Manufacturers:
  1. Blok-Lok Limited: [www.blok-lok.com/#sle](http://www.blok-lok.com/#sle).
  2. Hohmann & Barnard, Inc: [www.h-b.com/sle](http://www.h-b.com/sle).
  3. WIRE-BOND [www.wirebond.com/#sle](http://www.wirebond.com/#sle).
  4. Substitutions: See Section 01 6000 - Product Requirements.
- B. In addition to all other specification requirements, veneer anchors shall be designed by a professional engineer licensed in Texas, hired by the Contractor, where the horizontal distance is greater than 4 1/2 inches between the inside face of the masonry veneer (e.g. brick, concrete masonry, cast stone, etc...) and the outside face of the structural backup system (e.g. CMU, face of cold formed metal framing members, etc...).
- C. Reinforcing Steel: Type specified in Section 03 2000; size as indicated on drawings; uncoated finish.

- D. Wire reinforcement: Reinforced hot dip galvanized wall reinforcing in conformance with ASTM A951, for high tensile steel. hot-dipped galvanized to comply with ASTM A153, Class B Mill-galvanized wire reinforcement shall not be permitted on any part of the project. 9 gage wire, deformed to develop minimum surface bond of 527 PSI when cast in ASTM Class A mortar cubes. Provide rod spacings and veneer anchor dimensions to locate rods and veneer anchors in mortar to comply with the requirements of the applicable version of the Masonry Standards Joint Committee document TMS 402, referring to the construction drawings for dimensions of wythe thicknesses and dimensions between wythes.
- E. Veneer anchor wires: Reinforced hot dip galvanized wire in conformance with ASTM A951, for high tensile steel, hot-dipped galvanized to comply with ASTM A153, Class B. Mill-galvanized wire reinforcement shall not be permitted on any part of the project. 9 gage wire. Provide rod spacings and veneer anchor dimensions to locate rods and veneer anchors in mortar to comply with the requirements of the applicable version of the Masonry Standards Joint Committee document TMS 402, referring to the construction drawings for dimensions of wythe thicknesses and dimensions between wythes.
- F. Horizontal Bedjoint Reinforcement in Concrete Masonry, and Masonry Veneer Anchors with Concrete Masonry Backup Systems: Install bedjoint reinforcement at 16" on center in all concrete masonry walls, excluding masonry veneer wythes unless they are laid at the same time as backup masonry. Horizontal bedjoint reinforcement, as well as deformed rebar, shall continue through all crack control joints in all concrete masonry walls (both load-bearing and non-load-bearing, both interior and exterior).
  - 1. Single-wythe concrete masonry walls without masonry veneer: Ladder Type, using #220 Ladder-Mesh as manufactured by Hohmann & Barnard, Inc or equal.
  - 2. Single-wythe concrete masonry backup with masonry veneer laid at the same time: Ladder Type, using #230 Ladder-Tri-Mesh as manufactured by Hohmann & Barnard, Inc or equal.
  - 3. Single-wythe concrete masonry backup with masonry veneer laid after backup wythe: Install one of the following two options:
    - a. Provide bedjoint reinforcement with eyelets flush-welded, so as to avoid wire buildup of wire laminations, and adjustable double-pintle-leg anchors at 16" on center along the bedjoint reinforcement, using Adjustable Truss Lox-All Adjustable Eye-Wire with TRU-JOINT as manufactured by Hohmann & Barnard, Inc or equal, or
    - b. Provide bedjoint reinforcement without eyes, as noted above for Single-wythe concrete masonry walls without masonry veneer, and in alternating bedjoints with bedjoint reinforcement so as to avoid wire buildup of wire laminations, provide Adjustable Wall Ties (Pintles and Eyes) as manufactured by Hohmann & Barnard, Inc or equal, at 16" on center each way.
  - 4. Multiple-wythe concrete masonry walls, excluding masonry veneer wythes: Composite Truss Type with two rods in each wythe, using #140 Truss Twin-Mesh as manufactured by Hohmann & Barnard, Inc or equal. At walls with more than two structural wythes, alternate pairs of wythes being tied together at 8" on center so that each pair of wythes is being tied together at 16" on center.
    - a. To anchor masonry veneer to multiple-wythe concrete masonry backup systems: Install Adjustable Wall Ties (Pintles & Eyes) as manufactured by Hohmann & Barnard, Inc or equal at 16" on center each way.
- G. Masonry Veneer Anchors with Stud Backup Systems: Install adjustable wire tie system at 16" on center each way, with screws as recommended by the manufacturer and as required by the applicable version of TMS 402.
  - 1. Exterior stud walls with masonry veneer:
    - a. DW-10 Wall Ties as manufactured by Hohmann & Barnard, Inc.
    - b. Substitutions: See Section 01 6000 - Product Requirements.
  - 2. Interior stud walls with masonry veneer:
    - a. DW-10 Wall Ties as manufactured by Hohmann & Barnard, Inc.

- b. Substitutions: See Section 01 6000 - Product Requirements.
- 3. Screws for adjustable anchors shall be hex nut self-drilling, self-tapping composite zinc and polymer coated.

## **2.05 FLASHINGS**

- A. Through Wall Flashing Materials: Products as specified in Sections 07 2500 and 07 6200.

## **2.06 ACCESSORIES**

- A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
  - 1. Manufacturers:
    - a. Blok-Lok Limited: [www.blok-lok.com](http://www.blok-lok.com).
    - b. Hohmann & Barnard, Inc: [www.h-b.com/sle](http://www.h-b.com/sle).
    - c. WIRE-BOND: [www.wirebond.com/#sle](http://www.wirebond.com/#sle).
    - d. Substitutions: See Section 01 6000 - Product Requirements.
- B. Joint Filler: Closed cell polyethylene; oversized 50 percent to joint width; self expanding; 1/2 inch wide by maximum lengths available.
  - 1. Manufacturers:
    - a. Hohmann & Barnard, Inc: [www.h-b.com/sle](http://www.h-b.com/sle).
    - b. WIRE-BOND: [www.wirebond.com/#sle](http://www.wirebond.com/#sle).
    - c. Substitutions: See Section 01 6000 - Product Requirements.
- C. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
  - 1. Mortar Diverter: Semi-rigid mesh designed for installation at flashing locations.
    - a. Manufacturers:
      - 1) Hohmann & Barnard, Inc; Mortar Trap: [www.h-b.com/sle](http://www.h-b.com/sle).
      - 2) Mortar Net Solutions; MortarNet: [www.mortarnet.com/#sle](http://www.mortarnet.com/#sle).
      - 3) Substitutions: See Section 01 6000 - Product Requirements.
- D. Nailing Strips: Softwood lumber, preservative treated; as specified in Section 06 1000.
- E. Weeps:
  - 1. Type: Molded PVC grilles, insect resistant.
- F. Cavity Vents:
  - 1. Type: Molded PVC grilles, insect resistant.
- G. Bond Break Material - Provide one layer of 6 mil polyethylene equal to "Visqueen Vapour Barrier" as a bond breaker between all clay masonry and CMU in the same wythe. Rake joint back 3/8" and provide continuous sealant at joint.

## **2.07 LINTELS**

- A. All concrete masonry lintels, not including 4" nominal concrete masonry veneer lintels, shall be reinforced concrete masonry lintels as specified on the Structural Drawing Sheets unless steel beam supports are shown on the Structural Drawings. Where steel beam supports are shown, the concrete masonry shall be bonded to the top of the steel beam with 1/2" diameter Nelson D2Lbars x 24" long at 16" on center.
- B. All exterior masonry veneer supports over openings shall be as shown on the Structural Drawings.
- C. Full lintel support of masonry is required, and all lintels shall be fully galvanized prior to installation
- D. For interior masonry veneers with an air space between the veneer and backup, Interior masonry veneer supports over openings shall be the same as for exterior veneer supports, as shown on the Structural Drawings.

- E. For interior masonry veneer with a mortar-filled collar joint shown on the Drawings, interior masonry veneer supports shall be loose steel lintels as scheduled on the Structural Drawings.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Contractor shall note that the dimensions shown on the floor plans and plan details are nominal masonry dimensions. The contractor is responsible for coordinating the masonry layout to provide 3/8" joints. If conflict occurs, contractor shall contact Architect prior to installing masonry.
- B. Verify that field conditions are acceptable and are ready to receive masonry.
- C. Verify that related items provided under other sections are properly sized and located.
- D. Verify that built-in items are in proper location, and ready for roughing into masonry work.

#### **3.02 PREPARATION**

- A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
- B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.
- C. Surface Preparation for Masonry Units
  - 1. Do not commence installation until foundations are clean, rough, and level.
  - 2. Remove all laitance and foreign material from top of foundation.
  - 3. Verify that the foundation elevation is such that the bed joint thickness will be between 3/8" and 1/2", and that the foundation edge is true to line.
  - 4. Clean projecting dowels free from loose scale, dirt, concrete, and other material that will inhibit bond.
  - 5. Verify that dowels are in proper location.
- D. Surface Preparation for Rubberized Asphalt Flashing
  - 1. Apply primer by brush or heavy nap, natural-material roller at rate recommended by manufacturer prior to flashing installation. Allow primer to dry completely before flashing application.
- E. Collection System and Weeps
  - 1. Clean flashing and weep holes so they are free of mortar droppings and debris immediately prior to installing collection system or weep.
  - 2. Remove projecting mortar and other protrusions from substrate.
  - 3. Remove mortar and debris from cavity spaces, wall ties, and reinforcing.

#### **3.03 COLD AND HOT WEATHER REQUIREMENTS**

- A. Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.
- B. During cold weather construction do not lay masonry units unless the temperature is 40 degrees Fahrenheit and rising.
- C. During hot weather construction (ambient air temperature exceeds 100 degrees Fahrenheit or 90 degrees Fahrenheit with wind velocity greater than 8 mph) do not spread mortar beds more than 4 feet ahead of masonry and set brick masonry within 1 minute of spreading mortar. Fog spray cure twice daily at four hour intervals for three days during hot weather.
- D. Protect masonry construction from direct exposure to wind and sun when erected in ambient air temperature of greater than 99 degrees Fahrenheit in the shade, with relative humidity less than 50 percent.
- E. During hot weather protect brick masonry units from sun until units are ready to be placed in the wall.

### **3.04 COURSING**

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Bed joints in masonry units shall course out with bed joints in adjacent masonry wythes at vertical intervals of 16".
- D. Cut out and repoint defective joints.
- E. On all joints exposed to the weather, tool and make smooth, solid, and watertight.
- F. All joints shall be thumbprint hard prior to tooling.
- G. Use 18" sled on bed joints, brush wall, and retool joints.
- H. Concrete Masonry Units:
  - 1. Bond: Running.
  - 2. Coursing: One unit and one mortar joint to equal 8 inches.
  - 3. Mortar Joints: Concave at conditions exposed to view. Strike joints flush where a fluid applied weather barrier will be installed as specified in Section 07 2500 - Weather Barriers.
  - 4. Align vertical cells of hollow units to maintain a clear and unobstructed system of flues.
- I. Brick Units:
  - 1. Bond: Running.
  - 2. Coursing: Three units and three mortar joints to equal 8 inches.
  - 3. Mortar Joints: Concave.

### **3.05 PLACING AND BONDING**

- A. Full mortar joints are required throughout installation of any masonry surface.
- B. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
- C. Lay hollow masonry units with face shell bedding on head and bed joints.
- D. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- E. Remove excess mortar and mortar smears as work progresses.
- F. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.
- G. Interlock intersections and external corners, except for units laid in stack bond.
- H. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- I. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- J. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.
- K. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.
- L. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.
- M. Brick and CMU wythes shall be laid in a true and straight alignment. Exterior masonry shall be laid-up separately.
- N. Unless otherwise indicated on the Drawings, install masonry plumb, level, and true to line, with square angles and corners. Do not commence installation of the work until horizontal and vertical alignment of the foundation is within 1" plumb and the lines shown on the Drawings.



- O. Use line blocks whenever possible. When it is absolutely necessary to use a line pin, fill the hole immediately after the pin is withdrawn.
- P. Use only masonry that are clean and free from dust and other foreign matter and lay only dry masonry units.
- Q. Do not use bonding headers on grouted masonry unless specifically so directed by the Architect.
- R. Masonry with cracks and or chipped faces will be rejected if non-compliant with the limits noted in ASTM C216. If such units are discovered in the finished wall, the Contractor shall remove the units and replace with new units at no cost to the Owner.
- S. Lay only dry concrete masonry units.
- T. Accurately fit the units to plumbing, ducts, openings, and other interfaces, neatly patching all holes.
- U. Keep the walls continually clean, preventing grout and mortar stains. If grout does run over, clean immediately.
- V. Any metal work, glass or other finished surface is to be protected from damage during the masonry installation process, including lintels.
- W. Bed joints: A complete mortar-to-unit bond is required on all masonry.
  - 1. Avoid fins of bed joints protruding into grout space or cavity.
    - a. If they occur, leave in place if not projecting more than the bed joint thickness.
    - b. Do not, in any case, cut off and drop into the grout space or cavity.
- X. Head joints: Regardless of thickness, completely fill with mortar or grout. Do not slush full.
- Y. Lay both Wythes of the wall to a line.
- Z. Provide reinforcement as shown on the drawings, fully embedded in grout and not in mortar or mortar joints. Provide required metal accessories to insure adequate alignment of steel during grout filling operations.
- AA. At locations where items are mounted on/against split face CMU (i.e. door/window jambs, fire extinguisher cabinets, electric water coolers, etc.), grind split face CMU to allow flush, level installation.

### **3.06 WEEPS/CAVITY VENTS**

- A. Place weep vents in head joints at exterior wythe of cavity wall located immediately above all flashings, ledges, heads of lintels, sills, and low roof to high wall conditions spaced 24 inches on center for clay and stone masonry units and 32 inches on center for concrete masonry units, unless otherwise shown. Leave the side of the masonry units clear from mortar (unbuttered) forming the vent space.
  - 1. Place the vent material into joint, directly on top of flashing material, prior to installing the second masonry unit.
  - 2. Install the weep vents as the wall is being erected so joints do not become filled with mortar or debris.
  - 3. Install a minimum of two weeps above each exterior door/window.
- B. Install cavity vents in veneer and cavity walls at 24 or 32 inches on center horizontally near top of walls.

### **3.07 CAVITY MORTAR CONTROL**

- A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.
- B. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.
- C. Install 1 continuous row at base of wall and over all wall openings directly on flashing. To prevent mortar bridging between the outer wythe and inner wall, install flashing extending from the bottom of the collection system to at least 6" above the top of the collection system.

- D. Install with the offset edge pointing up the wall.
- E. Lay the first 1 or 2 courses of masonry at flashing level, then install the collection system continuously by placing it against the inside of the openings. No fasteners or adhesives are required.
- F. Compress the collection system horizontally so it can be forced into cavities slightly smaller than its nominal thickness without affecting performance. When forcing the collection system into a cavity, be sure mortar has set sufficiently to resist outward pressure from product.

### **3.08 REINFORCEMENT AND ANCHORAGE - GENERAL, SINGLE WYTHE MASONRY, AND CAVITY WALL MASONRY**

- A. Refer to the Structural and Architectural Drawings for reinforcement required in masonry.
- B. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches on center.
- C. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
- D. Place continuous joint reinforcement in first and second joint below top of walls.
- E. Lap joint reinforcement ends minimum 6 inches.
- F. Do not install masonry anchors at locations where fasteners will penetrate through wall flashing.
- G. Do not use reinforcement having any of the following defects.
  - 1. Bar lengths, depths, or bends exceeding the specified tolerances.
  - 2. Bends or kinks not indicated on the Drawings or required for the Work.
  - 3. Bars with cross-section reduced due to excessive rust or other causes.
- H. Masonry Tie Installation: Set wall plate in full bed of compatible sealant over substrate. Install fasteners to engage structural framing/masonry, ensuring fasteners are installed snug and straight. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 16 inches horizontally and 16 inches vertically.

### **3.09 MASONRY FLASHINGS**

- A. Coordinate masonry work with installation of metal and membrane through wall flashings in accordance with Sections 07 2500 and 07 6200.
- B. Laying Masonry Walls at Flashings:
  - 1. Provide a solid surface at flashing areas using inverted lintels, solid or filled masonry units. Flash at all breaks in wall face where cells are not grouted.
  - 2. At wall base flashings, place mortar bed on top of flashing.

### **3.10 GROUTED COMPONENTS**

- A. Fill one cell of CMU with grout and 1 - #5 bar vertical at each window and door jamb in CMU walls, from floor level to top of wall.
- B. Fill 3 cells of CMU with grout and 1 - #5 bar vertical in each cell at all exterior corners of CMU walls, fill full height of wall and extend #5 bar into bond beam a minimum of 6" then bend 90° and extend a minimum of 6".
- C. See drawings for other areas of grout fill required in CMU.
- D. Where the collar joint is to be grouted between the wythes of masonry, provide expanded metal or mortar/grout screen at the beginning of the grout.
- E. All vertical bars shall be dowelled to the foundations with same size reinforcing bar.
- F. Lap splices minimum 48 bar diameters.
- G. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.
- H. Place and consolidate grout fill without displacing reinforcing.

- I. At bearing locations, fill masonry cores with grout for a minimum 8 inches either side of opening.

### **3.11 CONTROL AND EXPANSION JOINTS**

- A. Locate 3/8" wide expansion and control joints as indicated on the drawings. However in no case shall they exceed 20'-0" in distance. Contractor shall ensure that joints occur at intervals no more than as noted above and notify the Architect for coordination of placement if additional joints are required. Keep vertical joints straight, true and continuous from top to bottom of masonry.
  - 1. Expansion joints shall be completely free of mortar and the joint reinforcement shall not continue across the expansion joint. Keep vertical joints straight, true and continuous from top to bottom of masonry. Detail joint as shown on the drawings
  - 2. At control joints horizontal reinforcing shall run continuous through joint. Detail joint as shown on the drawings.
- B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
- C. Form expansion joint as detailed on drawings.

### **3.12 BUILT-IN WORK**

- A. As work progresses, install built-in metal door frames and glazed frames and other items to be built into the work and furnished under other sections.
- B. Install built-in items plumb, level, and true to line.
- C. Bed anchors of metal door frames in adjacent mortar joints. Fill frame voids solid with grout.
  - 1. Fill adjacent masonry cores with grout minimum 8 inches from framed openings.
- D. Do not build into masonry construction organic materials that are subject to deterioration.

### **3.13 TOLERANCES**

- A. Maximum Variation from Alignment of Columns: 1/4 inch.
- B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
- C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
- D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
- F. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.
- G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

### **3.14 CUTTING AND FITTING**

- A. Cut and fit for chases, pipes, conduit, sleeves, and grounds. Coordinate with other sections of work to provide correct size, shape, and location.
- B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

### **3.15 FIELD QUALITY CONTROL**

- A. A Special Inspection and Testing Agency (SITA) will perform field quality control tests and inspections, as specified in Sections 01 4516 and 01 4533.

### **3.16 CLEANING**

- A. Remove excess mortar and mortar droppings.
- B. Replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution.
- D. Use non-metallic tools in cleaning operations.

### **3.17 PROTECTION**

- A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.
- B. The masonry walls shall be covered at the end of each workday and when work is not in progress. The walls shall be covered with heavy plastic sheeting or water repellent tarps and shall extend a minimum of 2'-0" down each side of the wall and be securely held in place.

**END OF SECTION**

**SECTION 04 7200  
CAST STONE MASONRY**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Architectural cast stone.

**1.02 RELATED REQUIREMENTS**

- A. Section 04 0511 - Masonry Mortaring and Grouting: Mortar for setting cast stone.
- B. Section 04 2000 - Unit Masonry: Installation of cast stone in conjunction with masonry.
- C. Section 07 9005 – Joint Sealers.

**1.03 REFERENCE STANDARDS**

- A. ACI 318 - Building Code Requirements for Structural Concrete 2019 (Reapproved 2022).
- B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- C. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement 2022.
- D. ASTM A767/A767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement 2019.
- E. ASTM A884/A884M - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement 2019, with Editorial Revision (2020).
- F. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete 2022.
- G. ASTM C33/C33M - Standard Specification for Concrete Aggregates 2023.
- H. ASTM C150/C150M - Standard Specification for Portland Cement 2022.
- I. ASTM C270 - Standard Specification for Mortar for Unit Masonry 2019a, with Editorial Revision.
- J. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete 2019, with Editorial Revision (2022).
- K. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete 2016.
- L. ASTM C1364 - Standard Specification for Architectural Cast Stone 2023.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Test results of cast stone components made previously by the manufacturer.
  - 1. Include one copy of ASTM C1364 for Architect's use.
- C. Shop Drawings: Include elevations, dimensions, layouts, profiles, cross sections, reinforcement, exposed faces, arrangement of joints, anchoring methods, anchors, and piece numbers.
  - 1. Cast stone and anchors shall be designed and stamped by a professional engineer in the State of Texas.
  - 2. Shop drawing sheets that include engineering information designed by the Contractor's Delegated Design Engineer shall be signed and sealed in accordance with the Texas Engineering Practice Act. Sheets that do not provide information designed by the Contractor's Engineer do not require being signed and sealed. Calculation packages require a signed and sealed cover sheet only. Any submittals requiring to be signed and sealed that are received without the signature and seal will be rejected without review.
- D. Mortar Color Selection Samples.

- E. Verification Samples: Pieces of actual cast stone components not less than 12 inches square, illustrating range of color and texture to be anticipated in components furnished for the project.
- F. Full-Size Samples, For Review:
  - 1. Basic Shapes: One of each.
  - 2. Accent, Trim and Specialty Shapes: One of each.
- G. Source Quality Control Test Reports.

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications:
  - 1. A firm with a minimum of 5 years experience producing cast stone of types required for project.
  - 2. Current producer member of the Cast Stone Institute or the Architectural Precast Association.
  - 3. Manufacturer's production facility currently holds a Plant Certification from the Cast Stone Institute or the Architectural Precast Association.
  - 4. Adequate plant capacity to furnish quality, sizes, and quantity of cast stone required without delaying progress of the work.

#### **1.06 MOCK-UP**

- A. Provide full size cast stone components for installation in mock-up of exterior wall.
- B. See Section 01 4000 - Quality Requirements for additional requirements.
  - 1. Approved mock-up will become standard for appearance and workmanship.
  - 2. Mock-up may remain as part of the completed work.
  - 3. Remove mock-up not incorporated into the work and dispose of debris.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver cast stone components secured to shipping pallets and protected from damage and discoloration. Protect corners from damage.
- B. Number each piece individually to match shop drawings and schedule.
- C. Store cast stone components and installation materials in accordance with manufacturer's instructions.
- D. Store cast stone components on pallets with nonstaining, waterproof covers. Ventilate under covers to prevent condensation. Prevent contact with dirt.
- E. Protect cast stone components during handling and installation to prevent chipping, cracking, or other damage.
- F. Store mortar materials where contamination can be avoided.
- G. Schedule and coordinate production and delivery of cast stone components with unit masonry work to optimize on-site inventory and to avoid delaying the work.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Architectural Cast Stone:
  - 1. Any current producer member of the Architectural Precast Association.
  - 2. Any current producer member of the Cast Stone Institute.

#### **2.02 ARCHITECTURAL CAST STONE**

- A. Cast Stone: Architectural concrete product manufactured to simulate appearance of natural stone, complying with ASTM C1364.
  - 1. Compressive Strength: As specified in ASTM C1364; calculate strength of pieces to be field cut at 80 percent of uncut piece.
  - 2. Freeze-Thaw Resistance: Demonstrated by laboratory testing in accordance with ASTM C1364.

3. Surface Texture: Fine grained texture, with no bugholes, air voids, or other surface blemishes visible from distance of 20 feet.
4. Cast Stone Color: Reference Section 01 6210 – Schedule of Materials and Colors.
5. Color Variation:
  - a. Viewing Conditions: Compare in direct daylight at 10 feet, between components of similar age, subjected to comparable weathering conditions.
  - b. Maximum Variation, ASTM D 2244:
    - 1) Hue: 2 units.
    - 2) Lightness, Chroma, and Hue Combined: 6 units.
6. Cure units in a warm, moist curing chamber at 95% relative humidity in totally enclosed curing room under dense fog and water-spray for 24 hours.
7. Remove cement film from exposed surfaces before packaging for shipment.
- B. Shapes: Provide shapes indicated on drawings.
  1. Variation from Any Dimension, Including Bow, Camber, and Twist: Maximum of plus/minus 1/8 inch or length divided by 360, whichever is greater, but not more than 1/4 inch.
  2. Unless otherwise indicated on drawings, provide:
    - a. Wash or slope of 1:12 on exterior horizontal surfaces.
    - b. Drips on projecting components, wherever possible.
    - c. Raised fillets at back of sills and at ends to be built in.
- C. Inset Letters:
  1. Refer to plans for copy.
  2. Paint all inset letters flat black.
- D. Reinforcement: Provide reinforcement as required to withstand handling and structural stresses; comply with ACI 318.
  1. Pieces More than 24 inches in Any Dimension: Provide full length two-way reinforcement of cross-sectional area not less than 0.25 percent of unit cross-sectional area.

## 2.03 MATERIALS

- A. Portland Cement: ASTM C150/C150M.
  1. For Units: Type I, white or gray as required to match Architect's sample.
  2. For Mortar: Type I or II, except Type III may be used in cold weather.
- B. Coarse Aggregate: ASTM C33/C33M, except for gradation; granite, quartz, or limestone.
- C. Fine Aggregate: ASTM C33/C33M, except for gradation; natural or manufactured sands.
- D. Pigments: ASTM C979, inorganic iron oxides; do not use carbon black.
- E. Admixtures: ASTM C494/C494M.
  1. All units shall contain a manufacturer approved integral water repellent admixture at the time of manufacture.
- F. Water: Potable.
- G. Reinforcing Bars: ASTM A615/A615M deformed bars, galvanized.
  1. Galvanized in accordance with ASTM A767/A767M, Class I.
- H. Steel Welded Wire Reinforcement: ASTM A1064/A1064M, galvanized or ASTM A884/A884M, epoxy coated.
- I. Embedded Anchors, Dowels, and Inserts: ASTM A 123/A 123M hot-dip galvanized steel, of type and size as required for conditions.
- J. Shelf Angles and Similar Structural Items: Hot-dip galvanized steel per ASTM A123/A123M, of shapes and sizes as required for conditions.
- K. Mortar: Portland cement-lime, as specified in Section 04 0511 ; do not use masonry cement.

- L. Sealer: Provide a weather/graffiti protectant to interior and exterior cast stone units as specified in Section 07 1900 - Water Repellents
- M. Cleaner: General-purpose cleaner designed for removing mortar and grout stains, efflorescence, and other construction stains from new masonry surfaces without discoloring or damaging masonry surfaces; approved for intended use by cast stone manufacturer and by cleaner manufacturer for use on cast stone and adjacent masonry materials.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine construction to receive cast stone components. Notify Architect if construction is not acceptable.
- B. Do not begin installation until unacceptable conditions have been corrected.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install cast stone components in conjunction with masonry, complying with requirements of Section 04 2000.
- C. Surface Preparation
  - 1. Clean substrates.
  - 2. Wet down or wash dry, dusty surfaces and remove excess water immediately prior to application of cast stone.
  - 3. Prepare surfaces in strict accordance with manufacturer's instructions.
  - 4. Scarify concrete substrates with blast track equipment if necessary to completely remove curing compounds or other substances that would interfere with proper bond of setting materials. Clean and maintain substrate in condition required by setting material manufacturer.
  - 5. Do not seal substrate unless required by manufacturer.
  - 6. Prime substrate when required by manufacturer.
- D. Mechanically anchor cast stone units indicated; set remainder in mortar.
- E. Setting:
  - 1. Drench cast stone components with clear, running water immediately before installation.
  - 2. Set units in a full bed of mortar unless otherwise indicated.
  - 3. Fill vertical joints with mortar.
  - 4. Fill dowel holes and anchor slots completely with mortar or non-shrink grout.

### **3.03 TOLERANCES**

- A. Joints: Make all joints 3/8 inch, except as otherwise detailed.
  - 1. Rake mortar joints 3/4 inch for pointing.
  - 2. Remove excess mortar from face of stone before pointing joints.
  - 3. Point joints with mortar in layers 3/8 inch thick and tool to a slight concave profile.
  - 4. Leave the following joints open for sealant:
    - a. Head joints in top courses, including copings, parapets, cornices, sills, and steps.
    - b. Joints in projecting units.
    - c. Joints between rigidly anchored units, including soffits, panels, and column covers.
    - d. Joints below lugged sills and stair treads.
    - e. Joints below ledge and relieving angles.
    - f. Joints labeled "expansion joint".
- B. Installation Tolerances:
  - 1. Variation from Plumb: Not more than 1/8 inch in 10 feet or 1/4 inch in 20 feet or more.
  - 2. Variation from Level: Not more than 1/8 inch in 10 feet or 1/4 inch in 20 feet, or 3/8 inch maximum.



3. Variation in Joint Width: Not more than 1/8 inch in 36 inches or 1/4 of nominal joint width, whichever is less.
4. Variation in Plane Between Adjacent Surfaces (Lipping): Not more than 1/16 inch difference between planes of adjacent units or adjacent surfaces indicated to be flush with units.

#### **3.04 REPAIR**

- A. Repair chips and other surface damage noticeable when viewed in direct daylight at 20 feet.
  1. Repair with matching touch-up material provided by the manufacturer and in accordance with manufacturer's instructions.
  2. Repair methods and results subject to Architect 's approval.

#### **3.05 CLEANING**

- A. Clean completed exposed cast stone after mortar is thoroughly set and cured.
  1. Wet surfaces with water before applying cleaner.
  2. Apply cleaner to cast stone in accordance with manufacturer's instructions.
  3. Remove cleaner promptly by rinsing thoroughly with clear water.
  4. Do not use acidic cleaners.

#### **3.06 PROTECTION**

- A. Protect completed work from damage.
- B. Clean, repair, or restore damaged or mortar-splashed work to condition of new work.

**END OF SECTION**



**SECTION 05 1200  
STRUCTURAL STEEL FRAMING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Structural steel framing members and support members.
- B. Base plates, shear stud connectors and expansion joint plates.
- C. Grouting under base plates.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 2100 - Steel Joist Framing.
- B. Section 05 3100 - Steel Decking: Support framing for small openings in deck.
- C. Section 05 5000 - Metal Fabrications: Steel fabrications affecting structural steel work.

**1.03 REFERENCE STANDARDS**

- A. AISC (MAN) - Steel Construction Manual 2023.
- B. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges 2022.
- C. AISC S303 - Code of Standard Practice for Steel Buildings and Bridges 2016.
- D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- E. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2022.
- F. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished 2018.
- G. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2021a.
- H. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing 2021.
- I. ASTM A514/A514M - Standard Specification for High-Yield-Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding 2022.
- J. ASTM A992/A992M - Standard Specification for Structural Steel Shapes 2022.
- K. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2021a.
- L. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2023.
- M. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength 2020.
- N. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2020.
- O. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2023).
- P. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections 2020.
- Q. UL (FRD) - Fire Resistance Directory Current Edition.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.

2. Connections and the calculations for the design of these connections.
  3. Indicate cambers and loads.
  4. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.
  5. Shop drawing sheets that include engineering information designed by the Contractor's Delegated Design Engineer shall be signed and sealed in accordance with the Texas Engineering Practice Act. Sheets that do not provide information designed by the Contractor's Engineer do not require being signed and sealed. Calculation packages require a signed and sealed cover sheet only. Any submittals requiring to be signed and sealed that are received without the signature and seal will be rejected without review.
- C. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.
- D. Mill Test Reports: Indicate structural strength, destructive test analysis and non-destructive test analysis.
- E. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

#### **1.05 QUALITY ASSURANCE**

- A. Fabricate structural steel members in accordance with AISC (MAN) "Steel Construction Manual."
- B. Maintain one copy of each document on site.
- C. Fabricator: Company specializing in performing the work of this section with minimum three years of documented experience.
- D. Erector: Company specializing in performing the work of this section with minimum three years of documented experience.
- E. Design connections not detailed on drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in Texas.

### **PART 2 PRODUCTS**

#### **2.01 MATERIALS**

- A. Steel Angles and Plates: ASTM A36/A36M.
- B. Steel W Shapes and Tees: ASTM A992/A992M.
- C. Cold-Formed Structural Tubing: ASTM A500/A500M, Grade B.
- D. Hot-Formed Structural Tubing: ASTM A501/A501M, seamless or welded.
- E. Steel Bars: ASTM A108 Grade 50.
- F. Steel Plate: ASTM A514/A514M.
- G. Steel Sheet: ASTM A1011/A1011M, Designation SS, Grade 30 hot-rolled, or ASTM A1008/A1008M, Designation SS, Grade 30 cold-rolled.
- H. Pipe: ASTM A53/A53M, Grade B, Finish black.
- I. Shear Stud Connectors: Made from ASTM A108 Grade 1015 bars.
- J. High-Strength Structural Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, with matching compatible ASTM A563 or ASTM A563M nuts and ASTM F436/F436M washers.
- K. Headed Anchor Rods: ASTM F 1554, Grade 55, plain as indicated on the drawings.
- L. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- M. Sliding Bearing Plates: Teflon coated.
- N. Grout: Non-shrink, non-metallic aggregate type, complying with ASTM C 1107/C 1107M and capable of developing a minimum compressive strength of 7,000 psi at 28 days.
- O. Shop and Touch-Up Primer: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.

- P. Touch-Up Primer for Galvanized Surfaces: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.

## **2.02 FABRICATION**

- A. Shop fabricate to greatest extent possible.
- B. Space shear stud connectors at as indicated on the drawings.
- C. Continuously seal joined members by intermittent welds and plastic filler. Grind exposed welds smooth.
- D. Fabricate connections for bolt, nut, and washer connectors.
- E. Develop required camber for members.

## **2.03 FINISH**

- A. Prepare structural component surfaces in accordance with SSPC SP 3, Power Tool Cleaning.
- B. Shop prime structural steel members. Do not prime surfaces that will be fireproofed, field welded, in contact with concrete, or high strength bolted.

## **2.04 SOURCE QUALITY CONTROL**

- A. If any steel fabrication occurs off-site (at a fabrication shop) that is not an AISC certified fabrication shop, the Steel Fabricator shall pay for the SITA to perform the special inspections or testing required by Section 01 4533 for all such off-site steel fabrication. Source quality control testing is not required for any steel provided by an AISC certified steel fabrication shop.

# **PART 3 EXECUTION**

## **3.01 EXAMINATION**

- A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

## **3.02 ERECTION**

- A. Erect structural steel in compliance with AISC 303.
- B. Allow for erection loads, and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- C. Field weld components and shear studs indicated on shop drawings.
- D. Use carbon steel bolts only for temporary bracing during construction, unless otherwise specifically permitted on drawings. Install high-strength bolts in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts".
- E. Do not field cut or alter structural members without approval of Architect.
- F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.
- G. Grout solidly between column plates and bearing surfaces, complying with manufacturer's instructions for nonshrink grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.

## **3.03 TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.

## **3.04 FIELD QUALITY CONTROL**

- A. A Special Inspection and Testing Agency (SITA) will perform field quality control tests and inspections, as specified in Sections 01 4516 and 01 4533.

## **END OF SECTION**



**SECTION 05 2100  
STEEL JOIST FRAMING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Open web steel joists and shear stud connectors, with bridging, attached seats and anchors.
- B. Loose bearing members, such as plates or angles, and anchor bolts for site placement.
- C. Supplementary framing for floor and roof openings greater than 18 inches.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 1200 - Structural Steel Framing: Grouting base plates and bearing plates. Superstructure framing.
- B. Section 05 1200 - Structural Steel Framing: Superstructure framing.
- C. Section 05 3100 - Steel Decking: Support framing for openings less than 18 inches in decking.
- D. Section 05 5000 - Metal Fabrications: Non-framing steel fabrications attached to joists.

**1.03 REFERENCE STANDARDS**

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- B. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished 2018.
- C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2023.
- D. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength 2021.
- E. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2023).
- F. SJI 100 - Standard Specifications for K-Series, LH-Series, and DLH-Series Open Web Steel Joists, and for Joist Girders 2020.
- G. SJI (SPEC) - Catalog of Standard Specifications Load Tables and Weight Tables for Steel Joists and Joist Girders 2011.
- H. SJI Technical Digest No. 9 - Handling and Erection of Steel Joists and Joist Girders 2008.
- I. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer 2004.
- J. SSPC-SP 2 - Hand Tool Cleaning 2018.
- K. UL (FRD) - Fire Resistance Directory Current Edition.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate standard designations, joist coding, configurations, sizes, spacings, cambers, locations of joists, joist leg extensions, bridging, connections, and attachments.
- C. Shop drawing sheets that include engineering information designed by the Contractor's Delegated Design Engineer shall be signed and sealed in accordance with the Texas Engineering Practice Act. Sheets that do not provide information designed by the Contractor's Engineer do not require being signed and sealed. Calculation packages require a signed and sealed cover sheet only. Any submittals requiring to be signed and sealed that are received without the signature and seal will be rejected without review.
- D. Welders' Certificates: Submit manufacturer's certificates, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.

**1.05 QUALITY ASSURANCE**

- A. Design connections not detailed on drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in Texas.

- B. Perform Work, including that for headers and other supplementary framing, in accordance with SJI 100 Standard Specifications Load Tables and SJI Technical Digest No. 9.
- C. Manufacturer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.
- D. Erector Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Transport, handle, store, and protect products to SJI requirements.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Steel Joists:
  - 1. Canam Group Inc: [www.canam-steeljoists.ws](http://www.canam-steeljoists.ws)
  - 2. Nucor-Vulcraft Group: [www.vulcraft.com/#sle](http://www.vulcraft.com/#sle).
  - 3. New Mellennium Building Systems, LLC: [www.newmill.com](http://www.newmill.com)
  - 4. Substitutions: See Section 01 6000 - Product Requirements.

#### **2.02 MATERIALS**

- A. Open Web Joists: SJI Type K Joists:
  - 1. Provide bottom and top chord extensions as indicated.
  - 2. Minimum End Bearing on Steel Supports: As shown on the drawings.
  - 3. Minimum End Bearing on Concrete or Masonry Supports: As shown on drawings.
  - 4. Finish: Shop primed.
- B. Anchor Bolts, Nuts and Washers: ASTM A307 hot-dip galvanized per ASTM A153/A153M Class C.
- C. Shear Stud Connectors: Made from ASTM A108 Grade 1015 bars.
- D. Structural Steel For Supplementary Framing and Joist Leg Extensions: ASTM A 36/A 36M.
- E. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- F. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

#### **2.03 FABRICATION**

- A. Frame special sized openings in joist web framing as detailed.

#### **2.04 FINISH**

- A. Shop prime joists as specified.
  - 1. Do not prime surfaces that will be fireproofed, field welded, or in contact with concrete.
- B. Prepare surfaces to be finished in accordance with SSPC-SP 2.

#### **2.05 SOURCE QUALITY CONTROL**

- A. For joist fabrication that occurs at a joist fabrication shop that is not an SJI certified joist fabrication shop, the Joist Fabricator shall pay for the SITA to perform the special inspections or testing required by Section 01 4533 for all such off-site steel fabrication. Source quality control testing is not required for any joists provided by an SJI certified joist fabrication shop.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify existing conditions prior to beginning work.

#### **3.02 ERECTION**

- A. Erect joists with correct bearing on supports.



- B. Allow for erection loads. Provide sufficient temporary bracing to maintain framing safe, plumb, and in true alignment.
- C. Coordinate the placement of anchors for securing loose bearing members furnished as part of the work of this section.
- D. After joist alignment and installation of framing, field weld joist seats to steel bearing surfaces.
- E. Position and field weld joist chord extensions and wall attachments as detailed.
- F. Install supplementary framing for floor and roof openings greater than 18 inches.
- G. Do not permit erection of decking until joists are braced, bridged, and secured or until completion of erection and installation of permanent bridging and bracing.
- H. Do not field cut or alter structural members without approval of joist manufacturer.
- I. After erection, prime welds, damaged shop primer, and surfaces not shop primed , except surfaces specified not to be primed.

### **3.03 TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch.
- B. Maximum Offset From True Alignment: 1/4 inch.

### **3.04 FIELD QUALITY CONTROL**

- A. A Special Inspection and Testing Agency (SITA) will perform field quality control tests and inspections, as specified in Sections 01 4516 and 01 4533.

**END OF SECTION**



**SECTION 05 3100  
STEEL DECKING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Acoustical roof deck.
- B. Roof deck.
- C. Composite floor deck.
- D. Metal form deck.
- E. Supplementary framing for openings up to and including 18 inches.
- F. Bearing plates and angles.
- G. Stud shear connectors.
- H. Acoustical insulation in roof deck flutes.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 2000 - Concrete Reinforcing.
- B. Section 03 3000 - Cast-in-Place Concrete: Concrete topping over metal deck.
- C. Section 05 1200 - Structural Steel Framing: Support framing for openings larger than 18 inches and shear stud connectors.
- D. Section 05 5000 - Metal Fabrications: Steel angle concrete stops at deck edges.
- E. Section 09 9000 - Painting and Coating

**2.01 REFERENCE STANDARDS**

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- B. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished 2018.
- C. ASTM A510/A510M - Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel, and Alloy Steel 2020.
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2023.
- E. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2021a.
- F. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel 2023.
- G. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2023).
- H. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel 2018, with Errata (2022).
- I. FM (AG) - FM Approval Guide Current Edition.
- J. ICC-ES AC43 - Acceptance Criteria for Steel Deck Roof and Floor Systems 2022.
- K. ICC-ES AC70 - Acceptance Criteria for Power-Actuated Fasteners Driven into Concrete, Steel and Masonry Elements 2019, with Editorial Revision (2021).
- L. SDI (DM) - Publication No.30, Design Manual for Composite Decks, Form Decks, and Roof Decks 2007.
- M. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic) 2019.
- N. UL (FRD) - Fire Resistance Directory Current Edition.

## **2.02 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittals procedures.
- B. Product Data: Provide deck profile characteristics, dimensions, structural properties, and finishes.
- C. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, pertinent details, and accessories.
- D. Shop drawing sheets that include engineering information designed by the Contractor's Delegated Design Engineer shall be signed and sealed in accordance with the Texas Engineering Practice Act. Sheets that do not provide information designed by the Contractor's Engineer do not require being signed and sealed. Calculation packages require a signed and sealed cover sheet only. Any submittals requiring to be signed and sealed that are received without the signature and seal will be rejected without review.
- E. Certificates: Certify that products furnished meet or exceed specified requirements.
- F. Submit manufacturer's installation instructions.
- G. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

## **2.03 QUALITY ASSURANCE**

- A. Design deck layout, spans, fastening, and joints under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in Texas.
- B. Installer Qualifications: Company specializing in performing the work of this Section with minimum three years of experience.

## **2.04 DELIVERY, STORAGE, AND HANDLING**

- A. Cut plastic wrap to encourage ventilation.
- B. Separate sheets and store deck on dry wood sleepers; slope for positive drainage.

## **PART 2 PRODUCTS**

### **3.01 MANUFACTURERS**

- A. Steel Deck:
  - 1. Canam Steel Corporation: [www.canam-steeljoists.ws](http://www.canam-steeljoists.ws).
  - 2. CSI - Metal Dek Group: [www.metaldek.com](http://www.metaldek.com)
  - 3. Nucor-Vulcraft Group: [www.vulcraft.com](http://www.vulcraft.com).
  - 4. New Millennium Building Systems, LLC: [www.newmill.com](http://www.newmill.com)
  - 5. Substitutions: See Section 01 6000 - Product Requirements.

### **3.02 STEEL DECK**

- A. Acoustical Roof Deck:
  - 1. Type "BA": Non-composite type, steel sheet with plain vertical flute faces perforated with 1/8 inch diameter holes staggered 3/8 inch on center and inert, non-organic glass fiber sound absorbing batts placed in the rib opening.
  - 2. Type "NA": Non-composite type, steel sheet with plain vertical flute faces perforated with 1/8 inch diameter holes staggered 3/8 inch on center and inert, non-organic glass fiber sound absorbing batts placed in the rib opening.
  - 3. Type "Toris A": As manufactured by Epic Metals (or Equal).
  - 4. Type "Toris 4A": As manufactured by Epic Metals (or Equal).
  - 5. Steel Sheet:
    - a. Ungalvanized Steel Sheet: ASTM A1008/1008M, Designation SS, Grade 33, Type 1. (typical) except where metal roof deck is to receive cementitious fireproofing.
    - b. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G90/Z275 galvanized coating where metal roof deck is to receive cementitious fireproofing.

6. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate. See Section 09 9000 - 'Painting and Coating for any additional requirements'.
  7. Structural Properties:
    - a. Span Design: Triple.
  8. Minimum Metal Thickness, Excluding Finish 20 gage (unless noted otherwise on the Structural Drawings).
  9. Nominal Height:
    - a. Type "BA": 1-1/2"
    - b. Type "Toris A": 2-1/2"
    - c. Type "NA": 3"
    - d. Type "Toris 4A": 4"
  10. Profile: Fluted.
    - a. Type "BA": Fluted SDI WR
    - b. Type "Toris A": Fluted As manufactured by Epic Metals (or Equal)
    - c. Type "NA" : Fluted SDI Deep WR
    - d. Type "Toris 4A": Fluted As manufactured by Epic Metals (or Equal)
  11. Formed Sheet Width:
    - a. Type "BA": 36 inch
    - b. Type "Toris A": 24 inch
    - c. Type "NA": 24 inch
    - d. Type "Toris 4A": 24 inch
  12. Deck Attachments: Unless noted otherwise on the Structural Drawings:
    - a. Side Joints: Lapped, mechanically fastened. 2 #10 TEK screws at each deck span
    - b. End Joints/Fasteners and Intermediate Support Fasteners:
      - 1) Type "BA": 5/8" puddle welds on a 36/7 pattern
      - 2) Type "Toris A": 3/4" Arc puddle welds on a 24/4 pattern
      - 3) Type "NA": puddle welds on a 24/4 pattern
      - 4) Type "Toris 4A": 3/4" Arc puddle welds on a 24/4 pattern
    - c. Side Support Fasteners: Welds matching end joint fastener at 6" on center.
- B. Roof Deck:
1. Type "B": Non-composite type, fluted steel sheet
  2. Type "Toris": As manufactured by Epic Metals (or Equal)
  3. Type "N": Non-composite type, fluted steel sheet
  4. Type "Toris 4": As manufactured by Epic Metals (or Equal)
  5. Steel Sheet:
    - a. Ungalvanized Steel Sheet: ASTM A1008/1008M, Designation SS, Grade 33, Type 1. (typical) except where metal roof deck is to receive cementitious fireproofing.
    - b. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G90/Z275 galvanized coating where metal roof deck is to receive cementitious fireproofing.
  6. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate. See Section 09 9000 - 'Painting and Coating' for any additional requirements.
  7. Structural Properties:
    - a. Span Design: Triple.
  8. Minimum Metal Thickness, Excluding Finish: 20 gage (unless noted otherwise on the Structural Drawings).
  9. Nominal Height:
    - a. Type "B": 1-1/2"
    - b. Type "Toris": 2-1/2"
    - c. Type "N": 3"
    - d. Type "Toris 4": 4"
  10. Profile:
-

- a. Type "B": Fluted; SDI WR
- b. Type "Toris": As manufactured by Epic Metals (or Equal)
- c. Type "N": Fluted; SDI Deep WR
- d. Type "Toris 4": As manufactured by Epic Metals (or Equal)
- 11. Formed Sheet Width:
  - a. Type "B": 36 inch
  - b. Type "Toris" 24 inch
  - c. Type "N": 24 inch
  - d. Type "Toris 4": 24 inch
- 12. Deck Attachment (Unless noted otherwise on the Structural Drawings):
  - a. Side Joints: Lapped, mechanically fastened. 2 #10 TEK screws at each deck span
  - b. End Joints/Fasteners and Intermediate Support Fasteners: Lapped, welded
    - 1) Type "B": 5/8" puddle welds on a 36/7 pattern
    - 2) Type "Toris": 3/4" Arc puddle welds on a 24/4 pattern
    - 3) Type "N": 5/8" puddle welds on a 24/4 pattern
    - 4) Type "Toris 4": 3/4" Arch puddle welds on a 24/4 pattern
  - c. Side Support Fasteners: Welds matching End joint fasteners at 6" on center
- C. Composite Floor Deck: Fluted steel sheet embossed to interlock with concrete:
  - 1. Galvanized Steel Sheet: {rs#1}, Structural Steel (SS) Grade 33/230, with G60/Z180 galvanized coating.
  - 2. Minimum Base Metal Thickness: 20 gage, 0.0359 inch.
  - 3. Nominal Height: 2 inches.
  - 4. Profile: Fluted. Equal to 2VLI as manufactured by Vulcraft
  - 5. Formed Sheet Width: 36 inch.
  - 6. Side Joints: Lock seam with button punches as required by deck manufacturer for construction purposes but not greater than 36" OC.
  - 7. End Joints/Fasteners and Intermediate Support Fasteners: Lapped, welded. 5/8" diameter puddle welds on a 36/4 pattern
  - 8. Side Support Fasteners: 5/8" diameter puddle welds at 9" on center.
  - 9. See Section 09 9000 - 'Painting and Coating' for any additional requirements for finish where composite floor deck occurs over crawl space.
- D. Metal Form Deck: Corrugated sheet steel:
  - 1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G60/Z180 galvanized coating.
  - 2. Minimum Metal Thickness, Excluding Finish: 20 gage unless noted otherwise on the structural drawings
  - 3. Nominal Height: 1 inch.
  - 4. Profile: Fluted. Equal to 1.0 C as manufactured by Vulcraft
  - 5. Formed Sheet Width: 33 inch.
  - 6. Side Joints: Lapped, mechanically fastened with 2 #10 TEK screws per span.
  - 7. End Joints: Lapped, mechanically fastened with #12 TEK screws on a 33/4 pattern.

### 3.03 ACCESSORY MATERIALS

- A. Bearing Plates and Angles: ASTM A36/A36M steel unfinished.
- B. Stud Shear Connectors: Made from ASTM A 108 Grade 1015 bars.
- C. Welding Materials: AWS D1.1/D1.1M.
- D. Fasteners: Galvanized hardened steel, self tapping.
- E. Powder Actuated Mechanical Fasteners: Steel; with knurled shank and forged ballistic point. Comply with applicable requirements of ICC-ES AC70.
  - 1. Design Requirements: Provide number and type of fasteners that comply with the applicable requirements of SDI (DM) design method for roof deck and floor deck applications and ICC-ES AC43.

2. Material: Steel; ASTM A510/A510M.
  - a. Hardness: Rockwell C 54.5, minimum.
  - b. Tensile Strength: 285 kips per square inch, minimum.
  - c. Shear Strength: 175 kips per square inch, minimum.
  - d. Washers:
    - 1) Steel Bar Joist Framing Applications: 0.472 inch diameter, minimum.
    - 2) Exposed Roof Deck Applications: 0.591 inch diameter, minimum.
  - e. Corrosion Resistance:
    - 1) Steel Bar Joist Framing Applications: ASTM B633, SC1, Type III zinc electroplate..
    - 2) Exposed Roof Deck Applications: Provide manufacturer's standard stainless steel sealing caps with bonded neoprene washer over each fastener.
- F. Mechanical Fasteners: Steel; hex washer head, self-drilling, self-tapping.
  1. Design Requirements for Sidelap Connections: Provide number and type of fasteners that comply with the applicable requirements of SDI (DM) design method for roof deck and floor deck applications and ICC-ES AC43.
  2. Fasteners for Steel Roof Decks Protected with Waterproofing Membrane: ASTM B633, SC1, Type III zinc electroplate.
  3. Fasteners for Exposed Steel Roof Deck Application: Manufacturer's standard stainless steel with bonded neoprene washer.
- G. Weld Washers: Mild steel, uncoated, 3/4 inch outside diameter, 1/8 inch thick.
- H. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, complying with VOC limitations of authorities having jurisdiction.
- I. Flute Closures: Closed cell foam rubber, 1 inch thick; profiled to fit tight to the deck.
- J. Acoustical Insulation: Glass fiber type, minimum 1.1 lb/cu ft density; profiled to suit deck.

### **3.04 FABRICATED DECK ACCESSORIES**

- A. Sheet Metal Deck Accessories: Metal closure strips, wet concrete stops, and cover plates, 20 gage, 0.0359 inch thick sheet steel; of profile and size as indicated; finished same as deck.
- B. Cant Strips: Formed sheet steel, 20 gage, 0.0359 inch minimum thickness, 45 degree slope, 3-1/2 inch nominal width and height, flange for attachment.
- C. Roof Sump Pans: Formed sheet steel, 14 gage, 0.0747 inch minimum thickness, flat bottom, sloped sides, recessed 1-1/2 inches below roof deck surface, bearing flange 3 inches wide, sealed watertight.
- D. Floor Drain Pans: Formed sheet steel, 14 gage, 0.0747 inch minimum thickness, flat bottom, sloped sides, recessed 1-1/2 inches below floor deck surface, bearing flange 3 inches wide, sealed watertight.

## **PART 3 EXECUTION**

### **4.01 EXAMINATION**

- A. Verify existing conditions prior to beginning work.

### **4.02 FIELD QUALITY CONTROL**

- A. A Special Inspection and Testing Agency (SITA) will perform field quality control tests and inspections, as specified in Sections 01 4516 and 01 4533.

### **4.03 INSTALLATION**

- A. Erect metal deck in accordance with SDI Design Manual. Align and level.
- B. On concrete surfaces provide minimum 4 inch bearing.
- C. On steel supports provide minimum 1-1/2 inch bearing.

- D. Fasten deck to steel support members at ends and intermediate supports as indicated in section 2.02, parallel with the deck flute and at every other transverse flute using methods indicated on drawings.
  - 1. Welding: Use fusion welds through weld washers.
  - 2. Place and secure special deep fluted sections for integral concrete bridging.
- E. At mechanically fastened male/female side laps fasten as indicated in section 2.02.
- F. Drive mechanical sidelap connectors completely through adjacent lapped sheets; positively engage adjacent sheets with minimum three-thread penetration.
- G. At welded male/female side laps weld at 18 inches on center maximum.
- H. Weld deck in accordance with AWS D1.3/D1.3M.
- I. At deck openings greater than 8 inches, provide support per Structural Drawings. Place angles perpendicular to flutes; extend minimum two flutes beyond each side of opening and fusion weld to deck at each flute.
- J. Where deck (other than cellular deck electrical raceway) changes direction, install 6 inch minimum wide sheet steel cover plates, of same thickness as deck, fusion weld 12 inches on center maximum, unless alternative detail is provided in the Structural Drawings.
- K. At floor edges, install concrete stops upturned to top surface of slab, to contain wet concrete. Provide stops of sufficient strength to remain stationary without distortion.
- L. At openings between deck and walls, columns, and openings, provide sheet steel closures and angle flashings to close openings.
- M. Close openings above walls and partitions perpendicular to deck flutes with double row of foam cell closures.
- N. Place metal cant strips in position and mechanically attach.
- O. Position roof drain pans with flange bearing on top surface of deck. Fusion weld at each deck flute.
- P. Position floor drain pans with flange bearing on top surface of deck. Fusion weld at each deck flute.
- Q. Weld stud shear connectors through steel deck to structural members below.
- R. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up primer.

**END OF SECTION**



**SECTION 05 4000  
COLD-FORMED METAL FRAMING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Formed steel stud exterior wall and interior wall framing, both load-bearing and non-load-bearing, including soffit framing and other non-structural miscellaneous framing.
- B. Formed steel joist and purlin framing and bridging.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 1200 - Structural Steel Framing.
- B. Section 05 3100 - Steel Decking.
- C. Section 06 1000 - Rough Carpentry: Wood blocking and miscellaneous framing.

**1.03 REFERENCE STANDARDS**

- A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members 2012.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2023.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2023.
- D. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2021a.
- E. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories 2020.
- F. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2023).
- G. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic) 2019.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate with work of other sections that is to be installed in or adjacent to the metal framing system, including but not limited to structural anchors, cladding anchors, utilities, insulation, and firestopping.

**1.05 SUBMITTALS**

- A. Product Data: Provide data on standard framing members; describe materials and finish, product criteria, limitations.
- B. Product Data: Provide manufacturer's data on factory-made framing connectors, showing compliance with requirements.
- C. Shop Drawings: Indicate component details, framed openings, bearing, anchorage, loading, welds, and type and location of fasteners, and accessories or items required of related work.
  - 1. Indicate stud, floor joist, ceiling joist, roof rafter, and roof truss layout.
  - 2. Describe method for securing studs and all of the cold formed metal framing to tracks and any other boundary supports all framing connections.
  - 3. Design data:
    - a. Shop drawing sheets that include engineering information designed by the Contractor's Delegated Design Engineer shall be signed and sealed in accordance with the Texas Engineering Practice Act. Sheets that do not provide information designed by the Contractor's Engineer do not require being signed and sealed. Calculation packages require a signed and sealed cover sheet only. Any submittals requiring to be signed and sealed that are received without the signature and seal will be rejected without review.

- D. Manufacturer's Installation Instructions: Indicate special procedures, conditions requiring special attention .

## **1.06 QUALITY ASSURANCE**

- A. Designer Qualifications: Design framing system under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in Texas.
- B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, and with minimum five years of documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience and approved by manufacturer.

## **1.07 MOCK-UP**

- A. Provide mock-up of exterior framed wall, including components specified elsewhere, such as insulation, sheathing, window frame, door frame, exterior wall finish, and interior wall finish.
- B. Mock-Up Size: 4 by 4 feet, including corner condition.
- C. Location: As directed.
- D. Mock-up may not remain as part of the Work.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Metal Framing:
  - 1. CEMCO: [www.cemcosteel.com](http://www.cemcosteel.com).
  - 2. ClarkDietrich Building Systems: [www.clarkdietrich.com](http://www.clarkdietrich.com).
  - 3. Mill Steel Company: [www.millsteel framing.com](http://www.millsteel framing.com)
  - 4. Telling Industries, LLC: [www.buildstrong.com](http://www.buildstrong.com).
  - 5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Framing Connectors and Accessories:
  - 1. Same manufacturer as metal framing.
  - 2. Simpson Strong Tie: [www.strongtie.com](http://www.strongtie.com).
  - 3. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 FRAMING SYSTEM**

- A. Provide primary and secondary framing members, straight and curved track, bridging, bracing, plates, gussets, clips, fittings, reinforcement, and fastenings as required to provide a complete framing system.
- B. Design Requirements: Provide completed framing system having the following characteristics:
  - 1. Design: Calculate structural characteristics of cold-formed steel framing members according to AISI S100-12.
  - 2. Structural Performance: Design, engineer, fabricate, and erect to withstand specified design loads for project conditions within required limits.
  - 3. Design Loads: As indicated on the drawings.
  - 4. Wind and Live load deflection meeting the following, unless otherwise indicated:
    - a. Floors: Maximum vertical deflection under live load of 1/360 of span.
    - b. Roofs: Maximum vertical deflection under live load of 1/180 over areas without a ceiling, 1/240 over areas with a nonplaster ceiling and 1/360 over areas with a plaster ceiling.
    - c. Interior Walls that have no exposure to exterior wind pressures: Maximum horizontal deflection under interior wind pressures of 1/360 of span.
    - d. Exterior Walls: Maximum horizontal deflection under service level Components and Cladding wind load of 1/600 of span where masonry veneer or plaster is outside of the stud wall and 1/360 of span where metal panel or flexible finishes are outside of the stud wall.

5. Able to tolerate movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
  6. Able to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.
- C. Shop fabricate framing system to the greatest extent possible.
- D. Deliver to site in largest practical sections.

## **2.03 FRAMING MATERIALS**

- A. Studs and Track: ASTM C955; studs formed to channel, "C", or "Sigma" shape with punched web; U-shaped track in matching nominal width and compatible height.
1. Gage and depth: Minimum 18 gage thickness for exterior walls, and depth as shown on the drawings. Minimum 25 gage thickness for interior walls, and depth as shown on the drawings. The Cold Formed Metal Framing Engineer may increase the gage and decrease the spacing as required for design but may not increase the depth as shown on the drawings.
  2. Galvanized in accordance with ASTM A653/A653M, G60/Z180 coating.
  3. Provide components fabricated from ASTM A 1008/A 1008M, Designation SS steel.
- B. Joists and Purlins: Fabricated from ASTM A653/A653M steel sheet, with G60/Z180 hot dipped galvanized coating.
1. Base Metal: Structural Steel (SS), Grade 33/230.
  2. Gage and depth: Minimum 18 gage thick, and depth as shown on the drawings. The Cold Formed Metal Framing Engineer may increase the gage and decrease the spacing as required for design but may not increase the depth as shown on the drawings.
- C. Framing Connectors: Factory-made, formed steel sheet.
1. Structural Performance: Maintain load and movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
  2. Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, shouldered screws or screws and anti-friction or stepped bushings, while maintaining structural performance of framing. Provide movement connections at the following locations:
    - a. Where continuous studs bypass elevated floor slab, connect stud to slab in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of 1/2 inch.
    - b. Where top of stud wall terminates below structural floor or roof, connect studs to structure in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of 1/2 inch.
    - c. Provide top track with long leg track and head of wall movement connectors; minimum track length of 12 feet.
  3. Fixed Connections: Provide non-movement connections for tie-down to foundation, floor-to-floor tie-down, roof-to-wall tie-down, joist hangers, gusset plates, and stiffeners.

## **2.04 FASTENERS**

- A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A153/A153M.
- B. Anchorage Devices: Powder actuated, Drilled expansion bolts, and Screws with sleeves.
- C. Welding: Comply with AWS D1.1/D1.1M.

## **2.05 ACCESSORIES**

- A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; finish to match framing components.
- B. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that building framing components are ready to receive work.
- B. Verify field measurements and adjust installation as required.

### **3.02 INSTALLATION OF STUDS**

- A. Install components in accordance with ASTM C1007 requirements and ASTM C1007 requirements.
- B. Align floor and ceiling tracks; locate to wall layout. Secure in place with fasteners at maximum 24 inches on center. Coordinate installation of sealant with floor and ceiling tracks.
- C. Place studs at 16 inches on center, maximum; not more than 2 inches from abutting walls and at each side of openings. Connect studs to tracks using fastener method.
- D. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.
- E. Install load bearing studs full length in one piece. Splicing of studs is not permitted.
- F. Install load bearing studs, brace, and reinforce to develop full strength and achieve design requirements.
- G. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.
- H. Install intermediate studs above and below openings to align with wall stud spacing.
- I. Provide deflection allowance in stud track, directly below horizontal building framing at non-load bearing framing.
- J. Attach cross studs to studs for attachment of fixtures anchored to walls.
- K. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.
- L. Touch-up field welds and damaged galvanized surfaces with primer.

### **3.03 INSTALLATION OF JOISTS AND PURLINS**

- A. Install framing components in accordance with manufacturer's instructions.
- B. Make provisions for erection stresses. Provide temporary alignment and bracing.
- C. Place joists at 16 inches on center; not more than 2 inches from abutting walls. Connect joists to supports using fastener method.
- D. Set floor and ceiling joists parallel and level, with lateral bracing and bridging.
- E. Locate joist end bearing directly over load bearing studs or provide load distributing member to top of stud track.
- F. Provide web stiffeners at reaction points.
- G. Touch-up field welds and damaged galvanized surfaces with primer.

### **3.04 TOLERANCES**

- A. Maximum Variation from True Position: 1/4 inch.
- B. Maximum Variation of any Member from Plane: 1/4 inch.

**END OF SECTION**

**SECTION 05 4400  
COLD-FORMED METAL TRUSSES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Light gage cold-formed steel roof trusses.
- B. Anchorages, bracing, and bridging.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 4000 - Cold-Formed Metal Framing: Light gage structural metal studs, joists, and rafters.
- B. Section 06 1000 - Rough Carpentry:

**1.03 REFERENCE STANDARDS**

- A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members 2012.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2023.
- C. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings 2020.
- D. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification 2021.
- E. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2023).
- F. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel 2018, with Errata (2022).
- G. CFSEI 5000 - Field Installation Guide for Cold-Formed Steel Roof Trusses May 2000.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-Installation Meeting: Meet at project site prior to beginning of installation to review requirements. Require attendance by representatives of the following:
  - 1. Truss fabricator.
  - 2. Truss installer.
  - 3. Other entities affected by the work of this section, including but not limited to truss support framing installer, mechanical systems installer, and electrical systems installer.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Span charts.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- C. Shop Drawings:
  - 1. Include detailed roof truss layout.
  - 2. Show member type, location, spacing, size and gage, methods of attachment, and erection details. Indicate supplemental bracing, strapping, splices, bridging, and accessories.
  - 3. Include truss design drawings, signed and sealed by a qualified professional engineer registered in Texas, verifying ability of each truss design to meet applicable code and design requirements.
    - a. Include the following:
      - 1) Design criteria.
      - 2) Engineering analysis depicting member stresses and deflections.
      - 3) Member sizes and gages.

- 4) Details of connections at truss joints.
- 5) Truss support reactions.
- 6) Bracing requirements.
- b. Shop drawing sheets that include engineering information designed by the Contractor's Delegated Design Engineer shall be signed and sealed in accordance with the Texas Engineering Practice Act. Sheets that do not provide information designed by the Contractor's Engineer do not require being signed and sealed. Calculation packages require a signed and sealed cover sheet only. Any submittals requiring to be signed and sealed that are received without the signature and seal will be rejected without review.

## **1.06 QUALITY ASSURANCE**

- A. Designer Qualifications: Design trusses under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in Texas.
- B. Fabricator Qualifications: Steel truss fabricator with minimum 5 years of experience designing and fabricating truss systems equivalent to those required for this project and licensed by an acceptable manufacturer.
- C. Installer Qualifications: Experienced installer approved by truss system fabricator.
- D. Welders: Qualify welding processes and welding operators in accordance with AWS B2.1/B2.1M.

## **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver trusses and other materials in manufacturer's unopened bundles or containers, each marked with manufacturer's name, brand, type, and grade. Exercise care to avoid damage during unloading, storing, and erection.
- B. Store trusses on blocking, pallets, platforms, or other supports, off the ground and in an upright position, sufficiently braced to avoid damage from excessive bending. Gently slope stored trusses to avoid accumulation of water on interior of truss chord members.
- C. Protect trusses and accessories from contact with earth, corrosion, deformation, mechanical damage, or other deterioration when stored at project site.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Cold-Formed Steel Trusses:
  - 1. Aegis Metal Framing, a Division of MiTek Industries: [www.aegismetalframing.com](http://www.aegismetalframing.com).
  - 2. TrusSteel Division of Alpine Engineered Products, Inc: [www.trussteel.com](http://www.trussteel.com).
  - 3. Nuconsteel (Nucor): [www.nuconsteel.com](http://www.nuconsteel.com)
  - 4. Steelway International: [www.SteelwayIntl.com](http://www.SteelwayIntl.com)
- B. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 TRUSS DESIGN REQUIREMENTS**

- A. Design: Calculate structural characteristics of cold-formed steel truss members according to AISI S100-12.
- B. Structural Performance: Design, engineer, fabricate, and erect trusses to withstand specified design loads for project conditions within required limits.
  - 1. Design Loads: As indicated in the Structural Drawings
  - 2. Deflections:
    - a. Roof Framing Members:
      - 1) Live Load Deflection Limits:
        - (a) Over areas without a ceiling: 1/180
        - (b) Over areas with a nonplaster ceiling: 1/240
        - (c) Over areas with a plaster ceiling: 1/360
      - 2) Total Load Deflection Limit: 1/120

3. Design trusses to accommodate movement attributable to temperature changes within a range of 120 degrees F without damage or overstressing, sheathing failure, undue strain on fasteners and anchors, or other deleterious effects.

### **2.03 COMPONENTS**

- A. Trusses: Light gage steel assemblies providing a complete horizontal framing system for locations indicated, ready for deck installation.
  1. Truss Type, Span, and Height: As indicated on drawings.
  2. Chord and Web Members: Fabricate required shapes from commercial quality galvanized steel sheet complying with ASTM A653/A653M, with minimum yield strength of 40,000 psi; minimum G60/Z180 coating; gages as required for load conditions; all edges rolled or closed.
- B. Fasteners: Self-drilling, self-tapping screw fasteners with corrosion-resistant plated finish, as recommended by steel truss manufacturer and marked for easy identification.
  1. Welding: Comply with applicable provisions of AWS D1.1/D1.1M and AWS D1.3/D1.3M.
- C. Bracing, Bridging, and Blocking Members: Fabricate required shapes from commercial quality galvanized steel sheet complying with ASTM A653/A653M, with minimum yield strength of 33,000 psi; minimum G60/Z180 coating; gages as required for load conditions.

### **2.04 FABRICATION**

- A. Factory fabricate cold-formed steel trusses plumb, square, true to line, and with secure connections, complying with manufacturer's recommendations and project requirements.
  1. Fabricate trusses using jig templates.
  2. Cut truss members by sawing, shearing, or plasma cutting.
  3. Fasten members in full compliance with instructions of manufacturer. Wire tying of framing members is not permitted.
- B. Tolerances: Fabricate trusses to maximum allowable tolerance variation from plumb, level and true line of 1/8 inch in 10 feet.
  1. Up to 30 feet Long: Maximum plus or minus 1/2 inch from design length.
  2. Over 30 feet Long: Maximum plus or minus 3/4 inch from design length.
  3. Up to 5 feet High: Maximum plus or minus 1/4 inch from design height.
  4. Over 5 feet High: Maximum plus or minus 1/2 inch from design height.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine structure, substrates, and installation conditions. Notify Architect of unsatisfactory preparation. Do not begin installation until substrates have been properly prepared and unsatisfactory conditions have been corrected.
- B. Proceeding with installation indicates installer's acceptance of substrate conditions.

### **3.02 INSTALLATION**

- A. Install cold-formed steel trusses in strict accordance with manufacturer's instructions and approved shop drawings, using approved fastening methods.
- B. Install temporary erection bracing and permanent bracing and bridging before application of any loads. Erect trusses with plane of truss webs vertical and parallel to each other, accurately located at spacing indicated. Anchor trusses securely at bearing points.
- C. Adequately distribute applied loads to avoid exceeding the carrying capacity of any one joint, truss, or other component.
- D. Exercise care to avoid damaging truss members during lifting and erection and to minimize horizontal bending of trusses.
- E. Removal, cutting, or alteration of any truss chord, web, or bracing member in the field is prohibited, unless approved in advance by Architect or the engineer of record and the truss manufacturer.

- F. Repair or replace damaged members and complete trusses as directed and approved in writing by Architect or the engineer of record and the truss manufacturer.
- G. Galvanizing Repair: Touch up bare steel with zinc-rich paint in compliance with ASTM A780/A780M.
- H. Field Welding: In accordance with AWS D1.1/D1.1M and AWS D1.3/D1.3M, as applicable, and as follows:
  - 1. Connections: Provide fillet, flat, plug, or butt welds, as indicated.
  - 2. Minimum steel thickness for welded connections, 18 gage, 0.0478 inch.
- I. Roof Trusses:
  - 1. Comply with recommendations of CFSEI 5000.
  - 2. Align truss bottom chords with load-bearing studs or continuously reinforce track as required to transfer loads to structure.
  - 3. Install continuous bridging and permanent truss bracing as indicated.
  - 4. Install roof cross bracing and diagonal bracing as indicated.

### **3.03 TOLERANCES**

- A. Install trusses to maximum allowable tolerance variation from plumb, level, and true to line of 1/8 inch in 10 feet.
- B. Space individual trusses not more than plus or minus 1/8 inch from plan location. Cumulative error in placement may not exceed minimum fastening requirements of sheathing or other material fastened to trusses.

### **3.04 FIELD QUALITY CONTROL**

- A. Perform field inspection and testing in accordance with Section 01 4000 - Quality Requirements.

### **3.05 PROTECTION**

- A. Protect trusses from damage by subsequent construction activities.
- B. Repair or replace damaged trusses, truss members, and bracing members; obtain approval in advance by Architect or the engineer of record and the truss manufacturer for all cutting, repairs, and replacements.
- C. Galvanizing Repairs: Bare steel, beyond the effect of zinc's sacrificial protection characteristics, shall be touched up with zinc-rich paint in accordance with ASTM A 780 and the paint manufacturer's instructions.

**END OF SECTION**



**SECTION 05 5000  
METAL FABRICATIONS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Shop fabricated steel items.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
- B. Section 04 2000 - Unit Masonry: Placement of metal fabrications in masonry.
- C. Section 05 1200 - Structural Steel Framing: Structural steel column anchor bolts.
- D. Section 05 2100 - Steel Joist Framing: Structural joist bearing plates, including anchorage.
- E. Section 05 3100 - Steel Decking: Bearing plates for metal deck bearing, including anchorage.
- F. Section 05 5100 - Metal Stairs.
- G. Section 05 5133 - Metal Ladders.
- H. Section 05 5213 - Pipe and Tube Railings.
- I. Section 09 9000 - Painting and Coating.

**1.03 REFERENCE STANDARDS**

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2022.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2023.
- E. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates 2018.
- F. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2021a.
- G. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2023.
- H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2023.
- I. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength 2022.
- J. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2020.
- K. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2023).
- L. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer 2004.
- M. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic) 2019.
- N. SSPC-SP 2 - Hand Tool Cleaning 2018.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
  - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.

#### **1.05 QUALITY ASSURANCE**

- A. Design miscellaneous steel and iron under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in Texas.

### **PART 2 PRODUCTS**

#### **2.01 MATERIALS - STEEL**

- A. Steel Sections: Shapes, bar and plate shall conform to ASTM A 36/A 36M. Light gauge structural steel shall conform to ASTM A924, latest revision. All material shall be straight, free from mill scale, rust, pitting and dents that will detract from finished appearance when painted.
- B. Steel Tubing: ASTM A500/A500M Grade B cold-formed structural tubing.
- C. Plates: ASTM A283/A283M.
- D. Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black finish.
- E. Slotted Channel Framing: ASTM A653/A653M, Grade 33.
- F. Slotted Channel Fittings: ASTM A1011/A1011M.
- G. Mechanical Fasteners: Same material as or compatible with materials being fastened; type consistent with design and specified quality level.
- H. Sheet Metal shall be open hearth, full pickled, cold rolled, annealed, patent leveled, entirely free from scale, waves and other defects.
- I. Bolts, Nuts, and Washers: ASTM F3125/F3125M, galvanized to ASTM A153/A153M where connecting galvanized components.
- J. Rivets shall conform to ASTM A-141, latest revision.
- K. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- L. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- M. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

#### **2.02 FABRICATION**

- A. All workmanship must be first-class in all respects and any members not presenting a finished and workmanlike appearance will be rejected. All finished members shall be free from twists, bends and open joints. Work shall conform to all applicable requirement of AISC.
- B. All members shall be true to length so that assembly may be done without fillers, except where same are required as detailed. There shall be no projecting edges or corners where different members are assembled. On exposed surfaces, welds shall be ground smooth and flush with parent metal. All coping, blocking or mitering shall be done with care. Sharp edges and corners caused by shearing or other tooling shall be eased where exposed.
- C. All details and connections shall be close fitting and carefully made and fitted, and special care shall be exercised to produce a thoroughly neat and workmanlike appearance. All detail pieces shall be made in exact accordance with Detail Drawings with all projecting corners clipped and all filler pieces made flush. Provide all lugs, clips, connections, bolts, etc., necessary to complete fabrication and erection.

- D. Unless otherwise shown on Drawings, all bolts remaining in the finished, exposed work shall have countersunk heads; nuts shall be hexagonal. Bolts shall be of proper length to permit full thread in the nut, but shall not project more than 1/4" beyond the face of the nut. Screws shall be countersunk Phillips head.
- E. The Contractor shall provide all holes in his work required for the connection of the work of other trades.
- F. There shall be no flame cutting of members in the field without the consent of the Architect. If consent is given, burned flame cut members shall be finished to an acceptable appearance that shall be equal of a sheared finish.
- G. Burning shapes to length in the shop with a standard flame cutting machine will be permitted. Burning of holes will NOT be permitted in the shop or in the field.
- H. Anchors for frames, floor angles and other miscellaneous iron members shown anchored into concrete or masonry shall be strap iron, bent to shape, or deformed bent bars welded to backs of members, extended with bent end for building in as conditions required and of sizes and spacing as noted. Where the size and spacing are not noted, anchors shall not be less than 1-1/2" x 1/4" for concrete and 1-1/2" x 1/8" for masonry to fit the jointing of the adjacent brick or masonry block work. Unless otherwise noted on the Drawings, anchors shall be spaced 3'-0" or less o.c.
- I. Where anchors and plates or clips are to be built in for attachment of later work, bolts shall be placed in the plates or clips and welded to back with threaded ends extended as required.
- J. For attaching work to masonry or concrete, where anchors or inserts cannot be built-in, provide approved type of cinch anchors and machine bolts or screws. Holes shall be accurately drilled.
- K. Fit and shop assemble items in largest practical sections, for delivery to site.
- L. Fabricate items with joints tightly fitted and secured.
- M. Continuously seal joined members by intermittent welds and plastic filler.
- N. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- O. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- P. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

### **2.03 FABRICATED ITEMS**

- A. Bollards: Steel pipe, concrete filled, prefabricated or hand formed crowned cap, or as detailed; prime paint finish.
- B. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking, joists, and masonry; prime paint finish.
- C. Lintels: As detailed; prime paint finish.
- D. Door Frames for Overhead Door Openings and Wall Openings: Channel and Angle sections; prime paint finish.
- E. Elevator Hoistway Divider Beams: Beam sections; prime paint finish.

### **2.04 UTILITY TRENCH, DRAINS AND CASTINGS**

- A. In fabricating items which will be exposed to view, limit materials to those which are free from surface blemishes, pitting, rolled trade names, and roughness.
- B. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

- C. Manufactures:
  - 1. Barry Pattern and Foundry: [www.barrycraft.com](http://www.barrycraft.com).
  - 2. Neenah Foundry Company: [www.nfco.com](http://www.nfco.com).
  - 3. Substitutions: See Section 01 6000 - Product Requirements.
- D. Cast Iron Downspout Boots: Barry Pattern and Foundry, model and size to coordinate with downspout size specified, or approved equivalent, 3'-0" height. Coordinate model to accommodate discharge to below grade piping if present, otherwise provide discharge at grade. Provide boots at all locations where downspouts discharge at ground level or connect to below grade storm sewer piping.
  - 1. Downspout Boot Anchors: Hilti HY20 stainless steel threaded rod adhesive anchor system, or approved equivalent.
- E. Provide 24 x 24 grate at elevator sump pit or size as noted on the drawings.

## **2.05 FINISHES - STEEL**

- A. Prime paint steel items.
  - 1. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.
- B. Prepare surfaces to be primed in accordance with SSPC-SP2.
- C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- D. Prime Painting: One coat.
- E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.
- F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.
- G. All steel exposed to weather, set in concrete shall be painted with cold galvanized zinc, specification of U.S. Navy MIL-P-21035, U.S. Air Force MIL-P-26915A, equal to Hot Dip galvanized in cathodic protection.

## **2.06 FABRICATION TOLERANCES**

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. The Contractor shall examine the construction to which his work is to be applied and shall notify the Architect in writing if deficiencies exist which are detrimental to the proper and timely installation of any work required under this section.

### **3.02 PREPARATION**

- A. The contractor shall examine the drawings and specifications with respect to the work shown or required under this section and related sections so as to insure the completeness of all work. Supplementary parts necessary to complete each item of miscellaneous iron and steel required under this section, such as bent plates, beams, columns, sleeves, clips, brackets, hangers, anchors, bolts and other fastenings and supports, though such parts are not shown on drawings or specified herein, shall be included.

- B. The Contractor shall coordinate and schedule the work of this section with the work of other trades. Anchors, sleeves, framing, fastenings and other miscellaneous items to be embedded in concrete or masonry or required for securing miscellaneous iron and steel work to other construction, shall be furnished as required and so as not to delay the progress of the work.
- C. The Contractor shall obtain field measurements of adjoining work as required to locate and fit the work of this section. He will be held responsible for the accurate fitting of his material to the building.
- D. Storage and Handling: Miscellaneous steel shall be handled and delivered to the job in a manner that will prevent damage to the material. Store in a dry place, under cover, well protected from weather and all elements that will cause deterioration.
- E. Clean and strip primed steel items to bare metal where site welding is required.
- F. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

### **3.03 INSTALLATION**

- A. Install items plumb and level, accurately fitted, free from distortion or defects. All parts shall be secured in a rigid and substantial manner and methods of attachment shall be concealed wherever practicable.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components as indicated.
- D. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.
- G. Other trades will set and build in items of miscellaneous iron which are to be built into masonry or concrete, such as loose lintels, seat angles, door frames, curbs, sleeve inserts, brackets, lugs, anchors, etc. as required to complete all parts of the work.
- H. All such items shall be fabricated and delivered by the miscellaneous iron trade, complete with bolts, anchors, clips, etc., ready for the other trades to set. This trade shall consult with the trades concerned and make delivery to the points designated by the latter to expedite the installation of delivered materials in their current locations and shall furnish setting drawings where required.
- I. Where frames, curbs, and similar work are composed of several parts, only those parts upon which anchors occur will, unless otherwise specified, be set and built-in by the other trades ready to receive further field assembly by the miscellaneous iron contractor.
- J. Where necessary to secure miscellaneous iron work to the structure by means of welding, expansion bolts, cinch anchors and similar connections, this trade shall, unless otherwise specified, do the work of laying out and installing such connections, installing the miscellaneous iron work and bolting up.
- K. All other items of miscellaneous iron shall be furnished and completely installed and connections made by this trade.
- L. Throughout the work of this trade, anchors and inserts shall be provided wherever possible for building in the adjoining work. Where lugs are shown or specified for building into adjoining masonry, the parts having lugs shall be erected in place before the masonry is built. Elsewhere, the work shall be brought to the building in as large pieces as practicable and attached to anchors or inserts during erection.
- M. All parts of work exposed to view shall be left clean, smooth and neatly finished.
- N. All freestanding steel handrails shall be embedded in the concrete slab unless noted otherwise.

- O. Shelf angles and supports for masonry, etc., and slab edge plates shall be furnished and installed as shown.
- P. All shelf angles shall be punched for bolts. Furnish and install bolts as required.

#### **3.04 WELDING**

- A. All welding on steel, both shop and field, shall be done by the electric method in accordance with the American Welding Society specifications. Welder shall be especially skilled in this class of work and qualified by successfully passing the American Welding Society tests and have a current certificate.
- B. Welds shall be solid and homogeneously a part of the metals joined and free from pits or incorporated slag and scale. Surfaces of welds shall be smooth and regular and shall be full area indicated or required to develop the required strength of the joints. Where exposed, welds shall be ground smooth and flush with the parent metal, so as to be imperceptible after painting.
- C. If directed by Architect, welds, selected at random, shall be tested by an approved laboratory and any welds not complying with the specifications shall be removed and replaced with satisfactory work. The cost of test shall be borne by the Contractor in all cases in which welding fails to comply with the specifications, otherwise by Owner. The cost of replacing condemned welds, plus the cost of replacing other materials damaged incidental thereto, shall be borne by the Contractor.
- D. Galvaweld: All welds on galvanized surfaces performed after galvanizing shall be Galvaweld coated.

#### **3.05 TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

**END OF SECTION**

**SECTION 05 5100  
METAL STAIRS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Stairs with concrete treads.
- B. Structural steel stair framing and supports.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete: Placement of metal anchors in concrete.
- B. Section 04 2000 - Unit Masonry: Placement of metal fabrications in masonry.
- C. Section 05 5000 - Metal Fabrications.

**1.03 REFERENCE STANDARDS**

- A. AISC 201 - AISC Certification Program for Structural Steel Fabricators, Standard for Steel Building Structures 2006.
- B. ASTM A6/A6M - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling 2022.
- C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- D. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2022.
- E. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- F. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2023.
- G. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates 2018.
- H. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2021a.
- I. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing 2021.
- J. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2023.
- K. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2021a.
- L. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2023.
- M. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength 2022.
- N. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2020.
- O. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2023).
- P. SSPC-SP 2 - Hand Tool Cleaning 2018.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
  - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
  - 2. Include the design engineer's seal and signature on each sheet of shop drawings.
  - 3. Shop drawing sheets that include engineering information designed by the Contractor's Delegated Design Engineer shall be signed and sealed in accordance with the Texas Engineering Practice Act. Sheets that do not provide information designed by the Contractor's Engineer do not require being signed and sealed. Calculation packages require a signed and sealed cover sheet only. Any submittals requiring to be signed and sealed that are received without the signature and seal will be rejected without review.
- C. Design Data: As required by authorities having jurisdiction.
- D. Welders' Certificates.
- E. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is certified under AISC 201.

### **1.05 QUALITY ASSURANCE**

- A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in Texas, or personnel under direct supervision of such an engineer.
- B. Welder Qualifications: Show certification of welders employed on the Work, verifying AWS qualification within the previous 12 months.
- C. Fabricator Qualifications:
  - 1. A qualified steel fabricator that is certified by the American Institute for Steel Construction (AISC) under AISC 201.

## **PART 2 PRODUCTS**

### **2.01 METAL STAIRS - GENERAL**

- A. Metal Stairs: Provide stairs of the design specified, complete with landing platforms, vertical and horizontal supports, railings, and guards, fabricated accurately for anchorage to each other and to building structure.
  - 1. Handrails: Comply with applicable accessibility requirements of ADA Standards.
  - 2. Structural Design: Provide complete stair and railing assemblies complying with the applicable local code.
  - 3. Dimensions: As indicated on drawings.
  - 4. Shop assemble components; disassemble into largest practical sections suitable for transport and access to site.
  - 5. No sharp or rough areas on exposed travel surfaces and surfaces accessible to touch.
  - 6. Separate dissimilar metals using paint or permanent tape.
- B. Metal Jointing and Finish Quality Levels:
  - 1. Commercial: Exposed joints as inconspicuous as possible, whether welded or mechanical; underside of stair not covered by soffit IS considered exposed to view.
    - a. Welded Joints: Intermittently welded on back side, filled with body putty, and sanded smooth and flush.
    - b. Welds Exposed to View: Ground smooth and flush.
    - c. Mechanical Joints: Butted tight, flush, and hairline.
    - d. Bolts Exposed to View: Countersunk flat or oval head bolts; no exposed nuts.
    - e. Exposed Edges and Corners: Eased to small uniform radius.
    - f. Metal Surfaces to be Painted: Sanded or ground smooth, suitable for satin or matte finish.
- C. Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.



- D. Anchors and Related Components: Same material and finish as item to be anchored, except where specifically indicated otherwise; provide all anchors and fasteners required.

## **2.02 METAL STAIRS WITH CONCRETE TREADS**

- A. Jointing and Finish Quality Level: Commercial, as defined above.
- B. Risers: Closed.
- C. Treads: Metal pan with field-installed concrete fill.
  - 1. Concrete Depth: 2 inches, minimum.
  - 2. Tread Pan Material: Steel sheet.
  - 3. Tread Pan Thickness: As required by design; 14 gage, 0.075 inch minimum. For lengths over 5'-6" use 12 gage. Where terrazzo is used as a finish on the treads provide 10 gauge risers for all tread lengths.
  - 4. Pan Anchorage to Stringers: Continuously welded, from top or bottom.
  - 5. Concrete Reinforcement: Welded wire mesh.
  - 6. Concrete Finish: Steel troweled.
- D. Risers: Same material and thickness as tread pans.
  - 1. Riser/Nosing Profile: Sloped riser with rounded nosing as specified in Section 05 5516.
- E. Stringers: Rolled steel channels, HSS members, and or as indicated on drawings.
  - 1. Stringer Depth: As indicated on drawings.
- F. Landings: Same construction as treads, supported and reinforced as required to achieve design load capacity.
- G. Railings: As specified in Section 05 5213 and/or Section 05 7000. Reference drawings for locations of each type where required.
- H. Finish: Shop- or factory-prime painted.
- I. Under Side of Stair: Exposed to view, to be finished same as specified for other exposed to view surfaces.

## **2.03 MATERIALS**

- A. Steel Sections: ASTM A36/A36M.
- B. Steel Tubing: ASTM A500/A500M or ASTM A501/A501M structural tubing, round and shapes as indicated.
- C. Steel Plates: ASTM A6/A6M or ASTM A283/A283M.
- D. Pipe: ASTM A53/A53M Grade B Schedule 40, black finish.
- E. Ungalvanized Steel Sheet: Hot- or cold-rolled, except use cold-rolled where finished work will be exposed to view.
  - 1. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Designation CS (commercial steel).
  - 2. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Designation CS (commercial steel).
- F. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230 with G40/Z120 coating.
- G. Concrete Fill: Type specified in Section 03 3000.
- H. Concrete Reinforcement: Mesh type as detailed, galvanized.

## **2.04 ACCESSORIES**

- A. Steel Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, and galvanized to ASTM A153/A153M where connecting galvanized components.
- B. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- C. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

## **2.05 SHOP FINISHING**

- A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- B. Do not prime surfaces in direct contact with concrete or where field welding is required.
- C. Prime Painting: Use specified shop- and touch-up primer.
  - 1. Preparation of Steel: In accordance with SSPC-SP 2 Hand Tool Cleaning.
  - 2. Number of Coats: One.
- D. Galvanizing: Hot-dip galvanize to minimum requirements of ASTM A123/A123M.
  - 1. Touch up abraded areas after fabrication using specified touch-up primer for galvanized surfaces.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive work.

### **3.02 PREPARATION**

- A. When field welding is required, clean and strip primed steel items to bare metal.
- B. Supply items required to be cast into concrete and embedded in masonry with setting templates.

### **3.03 INSTALLATION**

- A. Install components plumb and level, accurately fitted, free from distortion or defects.
- B. Provide anchors, plates, angles, hangers, and struts required for connecting stairs to structure.
- C. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- D. Provide welded field joints where specifically indicated on drawings. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Other field joints may be either welded or bolted provided the result complies with the limitations specified for jointing quality levels.
- F. Obtain approval prior to site cutting or creating adjustments not scheduled.
- G. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

### **3.04 TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.

**END OF SECTION**

**SECTION 05 5133  
METAL LADDERS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Shop-fabricated metal ladders.
- B. Prefabricated ship ladders.
- C. Ladder safety systems.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 5000 - Metal Fabrications
- B. Section 09 9000 - Painting and Coating

**1.03 REFERENCE STANDARDS**

- A. 29 CFR 1910.28 - Duty to have Fall Protection and Falling Object Protection Current Edition.
- B. 29 CFR 1910.29 - Fall Protection Systems and Falling Object Protection - Criteria and Practices Current Edition.
- C. 29 CFR 1910.140 - Personal fall protection systems Current Edition.
- D. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2014 (2015 Errata).
- E. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements 2018.
- F. ANSI/ASSP Z359.16 - Safety Requirements for Climbing Ladder Fall Arrest Systems 2016.
- G. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- H. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2022.
- I. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2023.
- J. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates 2018.
- K. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2021a.
- L. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength 2019, with Editorial Revision (2020).
- M. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2012.
- N. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020.
- O. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer 2004.
- P. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic) 2019.
- Q. SSPC-SP 2 - Hand Tool Cleaning 2018.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data sheets on each ladder safety system product to be used, including installation instructions.
- C. Shop Drawings:

1. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
  2. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- D. Certificate: Provide documentation that ladder safety system products of this section meet or exceed cited 29 CFR 1910.28, 29 CFR 1910.29, ANSI/ASSP Z359.16, and ANSI A14.3 requirements.
- E. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.

### **1.05 QUALITY ASSURANCE**

- A. Design miscellaneous steel and iron under direct supervision of a Professional Engineer experienced in design of this work and licensed in Texas.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS - STEEL**

- A. Steel Sections: ASTM A36/A36M.
- B. Steel Tubing: ASTM A500/A500M Grade B cold-formed structural tubing.
- C. Plates: ASTM A283/A283M.
- D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
- E. Mechanical Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.
- F. Bolts, Nuts, and Washers: ASTM F3125/F3125M, galvanized to ASTM A153/A153M where connecting galvanized components.
- G. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- H. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- I. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

### **2.02 MATERIALS - ALUMINUM**

### **2.03 FABRICATION**

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Continuously seal joined members by intermittent welds and plastic filler.
- D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

### **2.04 FABRICATED LADDERS**

- A. Ladders: Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; prime paint finish.
1. Side Rails: 3/8 by 2 inches members spaced at 20 inches.
  2. Rungs: One inch diameter solid round bar spaced 12 inches on center.
  3. Space rungs 7 inches from wall surface.

4. Comply with 29 CFR 1910.28 for fixed ladders that extend more than 24 feet above a lower level.
5. Provide ladders at elevator pit, roof hatch, floor hatch and roof-to-roof ladders where noted on the drawings or where required by code.
6. Provide Self-closing safety gate where indicated on the drawings. Gate shall automatically shut when released to block off entrances and exits when not in use.
  - a. Provide galvanized steel at exterior conditions and painted steel at interior conditions.

## **2.05 PREFABRICATED LADDERS**

- A. Prefabricated Ship Ladder: Welded metal unit complying with ANSI A14.3; factory fabricated to greatest degree practical and in the largest components possible.
  1. Components: Manufacturer's standard rails, rungs, treads, handrails, returns, platforms and safety devices complying with the requirements of the MATERIALS article of this section.
  2. Materials: Aluminum; ASTM B211/B211M 6063 alloy, T52 temper.
  3. Incline: 60 degrees.
  4. Finish: Manufacturer's standard clear anodized coating, comply with AAMA 611, Class 1.
  5. Basis of Design:
    - a. Ships ladder shall be equal to Model #521-10-LP as manufactured by O'Keefe's, Inc..
  6. Manufacturers:
    - a. Alaco Ladder Company: [www.alacoladder.com](http://www.alacoladder.com).
    - b. ACL Industries, Inc: [www.aclindustries.com](http://www.aclindustries.com).
    - c. O'Keefe's Inc: [www.okeeffes.com/#sle](http://www.okeeffes.com/#sle).
    - d. Precision Ladders, LLC: [www.precisionladders.com/#sle](http://www.precisionladders.com/#sle).
    - e. Substitutions: See Section 01 6000 - Product Requirements.

## **2.06 LADDER SAFETY SYSTEMS**

- A. Ladder Safety System: Comply with 29 CFR 1910.28 (b)(9)(i-iv), 29 CFR 1910.29, 29 CFR 1926.1053, and Section 7 of ANSI A14.3; ladder safety system allows the worker to climb up and down using both hands; does not require the employee continuously, hold, push, or pull any part of the system while climbing.
  1. Install on new fixed ladders over 24 feet in height.
  2. Anchorage: Fixed ladder meeting requirements of 29 CFR 1910.23.
  3. Flexible Carrier: Fixed 3/8 inch diameter galvanized steel wire rope lifeline with shock absorber and top, bottom and intermediate supports.
  4. Rigid Carrier: Fixed galvanized steel U-shaped slotted track with top, bottom and intermediate supports.
  5. Fall Arrester: Stainless steel and aluminum manual pass-through carrier sleeve fall arrester; compatible with carrier.
- B. Personal Fall Arrest System Components; 29 CFR 1910.140:
  1. Body Support: Full body harness meeting requirements of ANSI/ASSP Z359.11; equipped with front or hip D-rings for attachment to climbing ladder fall arrest system.
  2. Connecting Means: Connecting hardware, such as a locking carabiner, meeting requirements of ANSI/ASSP Z359.12; compatible with fall arrester and body support harness.

## **2.07 FINISHES - STEEL**

- A. Prime paint steel items.
  1. Do not prime surfaces in direct contact with concrete.
  2. Do not prime surfaces where field welding is required.
- B. Prepare surfaces to be primed in accordance with SSPC-SP2.
- C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- D. Prime Painting: One coat.

- E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.
- F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

## **2.08 FINISHES - ALUMINUM**

- A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.

## **2.09 FABRICATION TOLERANCES**

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

# **PART 3 EXECUTION**

## **3.01 EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Confirm that the ladder structure to which the ladder safety system is installed is capable of withstanding the loads applied by the system in the event of a fall.

## **3.02 PREPARATION**

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

## **3.03 INSTALLATION**

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Install ladder safety system in accordance with manufacturer's instructions.
- C. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- D. Field weld components as indicated.
- E. Perform field welding in accordance with AWS D1.1/D1.1M.
- F. Obtain approval prior to site cutting or making adjustments not scheduled.
- G. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

## **3.04 TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

**END OF SECTION**

**SECTION 05 5213  
PIPE AND TUBE RAILINGS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Wall mounted handrails.
- B. Stair or ramp railings and guardrails.
- C. Free-standing railings at steps.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete: Placement of anchors in concrete.
- B. Section 04 2000 - Unit Masonry: Placement of anchors in masonry.
- C. Section 05 5100 - Metal Stairs: Attachment plates for handrails specified in this section.
- D. Section 09 2982 - Gypsum Board: Placement of backing plates in stud wall construction.
- E. Section 09 9000 - Painting and Coating: Paint finish.

**1.03 REFERENCE STANDARDS**

- A. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2022.
- B. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2021a.
- C. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings 2021.
- D. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer 2004.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

**1.05 QUALITY ASSURANCE**

- A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in Texas, or personnel under direct supervision of such an engineer.
- B. Welder Qualifications: Show certification of welders employed on the Work, verifying AWS qualification within the previous 12 months.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Handrails and Railings Accessories:
  - 1. C.R. Laurence Co., Inc., Blumcraft: [www.crl-arch.com](http://www.crl-arch.com).
  - 2. Julius Blum & Company: [www.juliusblum.com](http://www.juliusblum.com).
  - 3. The Wagner Companies, Braun: [www.wagnercompanies.com](http://www.wagnercompanies.com).
  - 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Epoxy Grout:
  - 1. W.R. Meadows: EG-96 HP
  - 2. Substitutions: See Section 01 6000 - Product Requirements.

**2.02 RAILINGS - GENERAL REQUIREMENTS**

- A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of applicable local code.

- B. Design railing assembly, wall rails, and attachments to resist lateral force of 250 lbs at any point without damage or permanent set as required by OSHA, the Local Building Code and Texas Accessibility Standards. Test in accordance with ASTM E 935.
- C. Allow for expansion and contraction of members and building movement without damage to connections or members.
- D. Provide non-expansive epoxy grout (mounding up) all around and under each vertical pipe. No gypsum based grout allowed.
- E. Handrail Dimensions: See drawings for configurations and heights.
  - 1. Top Rails and Wall Rails: 1-1/2 inches diameter, round.
  - 2. Intermediate Rails: 1-1/2 inches diameter, round.
  - 3. Posts: 1-1/2 inches diameter, round at 4'-0" on center.
  - 4. Balusters: 3/4 inch diameter, round.
- F. Guardrail Dimensions: See drawings for configurations and heights.
  - 1. Top Rails: 1-1/2 or 2 inches diameter, round. Reference drawing for configuration used.
  - 2. Intermediate Rails: 1-1/2 inches diameter, round.
  - 3. Posts: 1-1/2 or 2 inches diameter, round. Reference drawing for configuration used.
    - a. 1-1/2" post shall be at 2'-0" on center.
    - b. 2" post shall be at 4'-0" on center.
  - 4. Balusters: 3/4 inch diameter, round.
- G. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
  - 1. For anchorage to concrete, provide inserts to be cast into concrete, for bolting anchors.
  - 2. For anchorage to masonry, provide brackets to be embedded in masonry, for bolting anchors.
  - 3. For anchorage to stud walls, provide backing plates, for bolting anchors.
  - 4. Posts: Provide adjustable flanged brackets.
- H. Provide mechanical and welding fittings where indicated to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.

### **2.03 STEEL RAILING SYSTEM**

- A. Steel Tube: ASTM A500/A500M Grade B cold-formed structural tubing.
- B. Steel Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black finish.
- C. Brackets and Accessories
  - 1. For wall mounted handrail brackets for steel handrails provide and install wall brackets equal to J.G. Braun #4591. Provide handrail returns equal to J.G. Braun 1100-1.
  - 2. For wall mounted handrail brackets for wood handrails provide and install Julius Blum #29 stainless two-piece wall bracket.
- D. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.
- E. Exposed Fasteners: Flush countersunk screws or bolts; consistent with design of railing.
- F. Straight Splice Connectors: Steel concealed spigots.
- G. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

### **2.04 FABRICATION**

- A. Accurately form components to suit specific project conditions and for proper connection to building structure.
- B. Fit and shop assemble components in largest practical sizes for delivery to site.



- C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.
- D. Welded Joints:
  - 1. Exterior Components: Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
  - 2. Interior Components: Continuously seal joined pieces by continuous welds.
  - 3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive work.

#### **3.02 PREPARATION**

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply items required to be cast into concrete, embedded in masonry, or placed in partitions with setting templates, for installation as work of other sections.

#### **3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.
- C. Anchor railings securely to structure.
- D. At each vertical post set in concrete cores, provide non-expansive epoxy grout. No gypsum based grout allowed.
- E. Field weld anchors as indicated on drawings. Touch-up welds with primer. Grind welds smooth.
- F. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

#### **3.04 TOLERANCES**

- A. Maximum Variation From Plumb: 1/8 inch per floor level, non-cumulative.
- B. Maximum Offset From True Alignment: 1/8 inch.
- C. Maximum Out-of-Position: 1/8 inch.

**END OF SECTION**



**SECTION 05 5305**  
**METAL GRATINGS AND FLOOR PLATES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Expanded Metal Grating

**1.02 RELATED REQUIREMENTS**

- A. Section 05 5000 - Metal Fabrications.
- B. Section 05 5100 - Metal Stairs: Framing for grating and stair treads.

**1.03 REFERENCE STANDARDS**

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2023.
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2023.
- E. ASTM A786/A786M - Standard Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates 2015 (Reapproved 2021).
- F. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2023.
- G. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2020.
- H. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2023).
- I. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer 2004.
- J. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic) 2019.
- K. SSPC-SP 2 - Hand Tool Cleaning 2018.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide span and deflection tables.
- C. Shop Drawings: Indicate details of component supports, openings, perimeter construction details, and tolerances.
  - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- D. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.
- E. Manufacturer's Installation Instructions: Indicate special requirements for opening and perimeter framing.

**1.05 QUALITY ASSURANCE**

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. McNichols Company: [www.mcnichols.com](http://www.mcnichols.com).
- B. Neenah Foundry Company: [www.nfco.com](http://www.nfco.com).
- C. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 PERFORMANCE REQUIREMENTS**

- A. Comply with applicable code for loading requirements.

### **2.03 MATERIALS**

- A. Expanded Metal Grating: expanded grating, plain steel, HRP, 3#/SF grating standard, 60% open area.
- B. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- C. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

### **2.04 FABRICATION**

- A. Fabricate grates and plates to accommodate design loads.
- B. Weld joints of intersecting metal sections.
- C. Fabricate support framing for openings.

### **2.05 FINISHES**

- A. Prepare surfaces to be primed in accordance with SSPC-SP 3.
- B. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- C. Do not prime surfaces in direct contact with concrete or where field welding is required.
- D. Prime and paint items with one coat.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated on drawings.
- B. Verify that opening sizes and dimensional tolerances are acceptable.
- C. Verify that supports are correctly positioned.

### **3.02 INSTALLATION**

- A. Install components in accordance with manufacturer's instructions.
- B. Place frames in correct position, plumb and level.
- C. Mechanically cut all finish surfaces. Do not flame cut.
- D. Anchor by welding.

**END OF SECTION**

**SECTION 05 5516  
METAL STAIR NOSINGS**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Interior Cast-in-Place Stair Nosings
- B. Exterior Cast-in-Place Stair Nosings

**1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete
- B. Section 05 5100 - Metal Stairs

**1.03 REFERENCE STANDARDS**

- A. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes and Tubes
- B. ADAAG, Americans with Disabilities Act Accessibility Guidelines.
- C. TAS, Texas Accessibility Standards

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product data: Within 15 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
  - 1. Materials list of items proposed to be provided under this Section;
  - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
  - 3. Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades; including color samples.
  - 4. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

**1.05 QUALITY ASSURANCE**

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- C. Perform shop and/or field welding required in connection with the work of this Section in strict accordance with pertinent recommendations of the American Welding Society.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with pertinent provisions of Section 01 6000 - Product Requirements.

**1.07 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a one year period after Date of Substantial Completion.

**PART 2 - PRODUCTS**

**2.01 MANUFACTURERS**

- A. American Safety Tread Company: [www.americansafetytread.com](http://www.americansafetytread.com)
- B. Babcock-Davis: [www.babcockdavis.com](http://www.babcockdavis.com).
- C. Balco, Inc.: [www.balcousa.com](http://www.balcousa.com)

- D. Nystrom, Inc.: [www.nystrom.com](http://www.nystrom.com).
- E. Substitutions: See Section 01 6000 - Product Requirements.

## **2.02 MATERIALS**

- A. Cast-in-Place Interior Stair Nosings
  - 1. At interior locations of concrete filled steel stair pans, stair nosings shall be a two part system, equal to type DST-330 (Type 1 Anchor) as manufactured by Balco, Inc. The base shall consist of heat treated extruded aluminum alloy 6063-T5. The abrasive filler shall consist of a mixture of aluminum oxide and silicon carbide granules in an epoxy matrix locked into the extruded channels of the base. The abrasive ribs shall project a minimum of 1/16 inch above the extruded channels. Nosings shall be full length of steps. Color shall be as selected by the architect.
- B. Exterior locations
  - 1. At exterior locations of concrete stairs, nosings shall be a two part system, equal to type XH-330 (Type 1 Anchor) as manufactured by Balco, Inc. The base shall consist of heat treated extruded aluminum alloy 6063-T5. The abrasive filler shall consist of a mixture of aluminum oxide and silicon carbide granules in an epoxy matrix locked into the extruded channels of the base. Nosings shall terminate not more than 1" from ends of steps for poured concrete stairs. Color shall be as selected by the architect.

## **2.03 ACCESSORIES**

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

## **2.04 FABRICATION**

- A. Except as otherwise shown on the Drawings or the approved Shop Drawings, use materials of size, thickness, and type required to produce reasonable strength and durability in the work of this Section.
- B. Fabricate with accurate angles and surfaces which are true to the required lines and levels, grinding exposed welds smooth and flush, forming exposed connections with hairline joints, and using concealed fasteners wherever possible.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine the area and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- B. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

### **3.02 INSTALLATION**

- A. General
  - 1. Set work accurately into position, plumb, level, true and free from rack.
  - 2. Anchor firmly into position.
  - 3. Where field welding is required, comply with AWS recommended procedures of manual-shielded metal-arc welding for appearance and quality of weld and for methods to be used in correcting welding work.
  - 4. Grind exposed welds smooth and touch-up shop prime coats.
  - 5. Do not cut, weld, or abrade surfaces which have been hot-dip galvanized after fabrication and which are intended for bolted or screwed field connections.

### **3.03 CLOSEOUT ACTIVITIES**

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

**3.04 PROTECTION**

- A. Protect installed Ladders from subsequent construction operations.

**3.05 MAINTENANCE**

- A. See Section 01 7000 - Execution Requirements, for additional requirements relating to maintenance service.

**END OF SECTION**





**SECTION 05 7000  
DECORATIVE METAL**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Railing and guardrail assemblies.
- B. Wall-mounted handrails.
- C. Free-standing railings at steps.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 5000 - Metal Fabrications: Supports.
- B. Section 05 5100 - Metal Stairs: Handrails other than those specified in this section.
- C. Section 09 2982 - Gypsum Board: Placement of backing plates in stud wall construction.

**1.03 REFERENCE STANDARDS**

- A. ADA Standards - 2010 ADA Standards for Accessible Design 2010.
- B. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes 2023.
- C. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength 2021.
- D. ASTM A554 - Standard Specification for Welded Stainless Steel Mechanical Tubing 2021.
- E. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2023.
- F. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings 2020.
- G. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings 2021.
- H. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2023).

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-Installation Meeting: Schedule and conduct a preinstallation meeting one week before starting work of this section. Attendees shall include, but not be limited to:
  - 1. Contractor.
  - 2. Manufacturer's representative.
  - 3. Architect.
  - 4. Other subcontractors of adjacent work.

**1.05 SUBMITTALS**

- A. Product Data: Submit manufacturer's product data including description of materials, components, finishes, fabrication details, glass, anchors, and accessories.
- B. Shop Drawings: Indicate railing system elevations and sections, details of profile, dimensions, sizes, connection attachments, anchorage, size and type of fasteners, and accessories. Indicate anchor and joint locations, brazed connections, transitions, and terminations.
- C. Test Reports: Submit test reports from an independent testing agency showing compliance with specified design and performance requirements.
- D. Manufacturer's Installation Instructions.
- E. Maintenance Data: Manufacturer's instructions for care and cleaning.
- F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

## **1.06 QUALITY ASSURANCE**

- A. Designer Qualifications: Design railing system under direct supervision of a Professional Engineer experienced in design of this work and licensed in Texas.
- B. Installer Qualifications: Company specializing in installing decorative stairs and railing systems and acceptable to manufacturer.
- C. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than three years of experience.
- D. Templates: Supply installation templates, reinforcing and required anchorage devices.

## **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Protect materials against damage during transit, delivery, storage, and installation at site.
- B. Inspect materials upon delivery for damage. Repair damage to be indistinguishable from undamaged areas; if damage cannot be repaired to be indistinguishable from undamaged parts and finishes, replace damaged items.

## **1.08 FIELD CONDITIONS**

- A. Do not install railings until project is enclosed and ambient temperature of space is minimum 65 degrees F and maximum 95 degrees F.
- B. Maintain ambient temperature of space at minimum 65 degrees F and maximum 95 degrees F for 24 hours before, during, and after railing installation.

## **1.09 WARRANTY**

- A. Warranty: Manufacturer's standard one year warranty against defects in materials, fabrication, finishes, and installation commencing on Date of Substantial Completion.

# **PART 2 PRODUCTS**

## **2.01 MANUFACTURERS**

- A. Decorative Metal Railings:
  - 1. C. R. Laurence Company, Inc: [www.crl-arch.com/#sle](http://www.crl-arch.com/#sle).
  - 2. HDI Railing Systems: [www.handrail-design.com](http://www.handrail-design.com).
  - 3. Hoffa Inc.: [www.hoffainc.com](http://www.hoffainc.com)
  - 4. Hollaender Manufacturing Co: [www.hollaender.com/#sle](http://www.hollaender.com/#sle).
  - 5. Livers Bronze Co.: [www.liversbronze.com](http://www.liversbronze.com)
  - 6. Viva Railings, LLC: [www.vivarailings.com/#sle](http://www.vivarailings.com/#sle).
  - 7. Substitutions: See Section 01 6000 - Product Requirements.

## **2.02 RAILING SYSTEMS**

- A. Railing Systems - General: Factory- or shop-fabricated in design indicated, to suit specific project conditions, and for proper connection to building structure, and in largest practical sizes for delivery to site.
  - 1. Performance Requirements: Design and fabricate railings and anchorages to resist the following loads without failure, damage, or permanent set; loads do not need to be applied simultaneously.
    - a. Lateral Force: 75 lb minimum, at any point, when tested in accordance with ASTM E935.
    - b. Distributed Load: 50 lb/ft minimum, applied in any direction at the top of the handrail, when tested in accordance with ASTM E935.
    - c. Concentrated Loads on Intermediate Rails: 50 psf, minimum.
    - d. Concentrated Load: 200 lbs minimum, applied in any direction at any point along the handrail system, when tested in accordance with ASTM E935.
    - e. Handrails: Comply with applicable accessibility requirements of ADA Standards.
  - 2. Assembly: Join lengths, seal open ends, and conceal exposed mounting bolts and nuts using slip-on non-weld mechanical fittings, flanges, escutcheons, and wall brackets.

3. Joints: Tightly fitted and secured, machined smooth with hairline seams.
4. Field Connections: Provide sleeves to accommodate site assembly and installation.
- B. Metal Railing: Engineered, post-supported railing system with metal infill.
  1. Configuration: Guardrail with separate handrail.
  2. Top Rail: 2 inch diameter pipe or tube.
  3. Grip Rail: Round, stainless steel, 1-1/2 inch diameter.
  4. Decorative Flanges for Embedded Posts: Circular, collared cover plate without screw holes.
  5. Wall Mounted Components: Components necessary to support railing with 1-1/2 inch clearance from wall, and as follows:
    - a. Underslung support brackets: Supports at 60 inches, maximum.
    - b. Wall return without support: Terminates 1/4 inch from side wall.
  6. Handrail Brackets: Same metal as railing.
  7. Fasteners: Concealed.
  8. Infill at Picket Railings: Vertical pickets.
    - a. Horizontal Spacing: Maximum 4 inches on center.
    - b. Material: Solid steel bar.
    - c. Size: 1/2 inch diameter.
  9. End and Intermediate Posts: Same material and size as top rails.
    - a. Horizontal Spacing: As indicated on drawings.
    - b. Mounting: Welded.
  10. Basis of Design: VIVA Railings, LLC; "CIRCA Stainless Steel Modular Railing System": [www.vivarailings.com](http://www.vivarailings.com)
  11. Basis of Design: VIVA Railings, LLC; "FSR Stainless Steel Modular Railing System": [www.vivarailings.com](http://www.vivarailings.com)
- C. Wall-Mounted Handrail:
  1. 1-1/2 inch diameter stainless steel; No. 6 satin finish..
  2. Internal Connection Sleeves: Sleeve, material compatible with handrail and top cap material.
  3. Handrail Brackets: Manufacturer's standard stainless steel brackets.
    - a. Mounting: Wall.
    - b. Finish: No. 6 satin finish..
  4. Comply with TAS and ADA Standards.

## **2.03 MATERIALS**

- A. Stainless Steel Components:
  1. ASTM A666, Type 304.
  2. Stainless Steel Tubing: ASTM A554, Type 304, 16 gage, 0.0625 inch minimum metal thickness, 1-1/2 inch diameter.
  3. Stainless Steel Bars, Shapes and Moldings: ASTM A276/A276M, Type 304.
  4. Stainless Steel Finish: No. 6 satin finish..

## **2.04 ACCESSORIES**

- A. Non-Weld Mechanical Fittings for Stainless Steel Railings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.
- B. Anchors and Fasteners: Provide anchors and other materials as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
  1. Exposed Fasteners: No exposed bolts or screws.
- C. Carbon Steel Bolts and Nuts: ASTM A307.
- D. Sealant: Silicone; clear.

- E. Finish Touch-Up Materials: As recommended by manufacturer for field application.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that substrate and site conditions are acceptable and ready to receive work.
- B. Verify field dimensions of locations and areas to receive work.
- C. Notify Architect immediately of conditions that would prevent satisfactory installation.
- D. Do not proceed with work until detrimental conditions have been corrected.

#### **3.02 PREPARATION**

- A. Protect existing work.
- B. Clean surfaces to receive units. Remove materials and substances detrimental to the installation.

#### **3.03 INSTALLATION**

- A. Comply with manufacturer's drawings and written instructions.
- B. Anchor securely to structure.
- C. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.
- D. Weld connections that cannot be shop welded due to size limitations.
  - 1. Weld in accordance with AWS D1.1/D1.1M.
  - 2. Match shop welding and bolting.
  - 3. Repair galvanizing with galvanizing repair paint per ASTM A780/A780M.

#### **3.04 TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

#### **3.05 FIELD QUALITY CONTROL**

- A. Field Services: Provide the services of the manufacturer for field observation of installation of railings.

#### **3.06 CLEANING**

- A. Remove protective film from exposed metal surfaces.
- B. Glass and Glazing: Clean glazing surfaces; remove excess glazing sealant compounds, dirt, and other substances.

#### **3.07 PROTECTION**

- A. Protect installed components and finishes from damage after installation.
- B. Repair damage to exposed finishes to be indistinguishable from undamaged areas.
  - 1. If damage to finishes and components cannot be repaired to be indistinguishable from undamaged finishes and components, replace damaged items.

**END OF SECTION**

**SECTION 06 1000  
ROUGH CARPENTRY**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Non-structural dimension lumber framing.
- B. Structural Composite Lumber
- C. Sheathing.
- D. Roofing nailers.
- E. Roofing cant strips.
- F. Preservative treated wood materials.
- G. Fire retardant treated wood materials.
- H. Miscellaneous framing and sheathing.
- I. Concealed wood blocking, nailers, and supports.
- J. Miscellaneous wood nailers, furring, and grounds.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 1200 - Structural Steel Framing: Prefabricated beams and columns for support of wood framing.
- B. Section 05 5000 - Metal Fabrications: Miscellaneous steel connectors and support angles for wood framing.
- C. Section 07 2500 - Weather Barriers
- D. Section 07 7200 - Roof Accessories: Prefabricated roof curbs.

**1.03 REFERENCE STANDARDS**

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2023.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2023.
- C. ASTM D2898 - Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing 2010 (Reapproved 2017).
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023b.
- E. AWPA U1 - Use Category System: User Specification for Treated Wood 2023.
- F. PS 1 - Structural Plywood 2019.
- G. PS 2 - Performance Standard for Wood Structural Panels 2018.
- H. PS 20 - American Softwood Lumber Standard 2021.
- I. SPIB (GR) - Standard Grading Rules 2021.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide technical data on insulated sheathing, wood preservative materials, application instructions, and vendor.
- C. Structural Composite Lumber: Submit manufacturer's published structural data including span tables, marked to indicate which sizes and grades are being used; if structural composite lumber is being substituted for dimension lumber or timbers, submit grading agency structural tables marked for comparison.

- D. Samples: For rough carpentry members that will be exposed to view, submit three samples, 12by12 inch in size illustrating wood grain, color, and general appearance.
- E. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

#### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.
  - 1. For lumber and plywood pressure treated with waterborne chemicals, place spacers between each bundle to provide air circulation.
  - 2. Identify plywood sheathing as to grade, use, span rating and exposure classification by the mark of the APA The Engineered Wood Association.
  - 3. Use extreme care when off-loading lumber to prevent damage, splitting and breaking of materials. Split or broken plywood sheathing will not be accepted for use in the work of this Section.
- B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

### **PART 2 PRODUCTS**

#### **2.01 GENERAL REQUIREMENTS**

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
  - 1. Species: Spruce-Pine-Fir (South), unless otherwise indicated.
  - 2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee ([www.alsc.org](http://www.alsc.org)) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
  - 3. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

#### **2.02 DIMENSION LUMBER**

- A. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).
- B. Sizes: Nominal sizes as indicated on drawings, S4S.
- C. Moisture Content: 19 percent maximum.
- D. Stud Framing (2 by 2 through 2 by 6 ):
  - 1. Species: Any allowed under referenced grading rules.
  - 2. Grade: No. 2.
- E. Joist and Rafter Framing (2 by 6 through 4 by 16 ):
  - 1. Species: Spruce-Pine-Fir (South).
  - 2. Grade: No. 2.
- F. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
  - 1. Lumber: S4S, No. 2 or Standard Grade.
  - 2. Boards: No. 2 or Standard Grade.

#### **2.03 STRUCTURAL COMPOSITE LUMBER**

- A. System Description
  - 1. Design Requirements: Design gate system to withstand Miami/Dade County 110 MPH steady wind and 130 MPH gusting wind tests.
- B. Warranties
  - 1. Furnish manufacturer's 10-year warranty providing coverage against checking, splitting, splintering, rotting, structural damage from termites and fungal decay of composite wood.
- C. Materials
  - 1. Composite Wood:

- a. Reclaimed wood and plastic with integral coloring; free from toxic chemicals and preservatives.
- D. Components
  - 1. Gate System: as detailed on the drawings.
    - a. Components:
      - 1) Pickets
      - 2) Top and bottom rails.
      - 3) Bottom rail inserts.
    - b. Surface texture: Smooth.
    - c. Color: as selected by Architect.
- E. Accessories
  - 1. Fasteners: Galvanized or corrosion-resistant coated steel.
  - 2. Provide stainless steel where used at fire retardant or pressure treated wood.
- F. Manufacturers:
  - 1. Trex Company: [www.trex.com](http://www.trex.com)
  - 2. iLevel by Weyerhaeuser: [www.ilevel.com](http://www.ilevel.com).
  - 3. Boise Cascade: [www.bc.com](http://www.bc.com).
  - 4. Georgia-Pacific Corp.: [www.gp.com](http://www.gp.com).
  - 5. Substitutions: See Section 01 6000 - Product Requirements.

#### **2.04 EXPOSED BOARDS**

- A. Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.
- B. Moisture Content: S-dry (19 percent maximum).
- C. Surfacing: S4S.
- D. Species: Douglas Fir.
- E. Grade: No. 2, 2 Common, or Construction.

#### **2.05 CONSTRUCTION PANELS**

- A. Roof Sheathing: Any PS 2 type, rated Structural I Sheathing.
  - 1. Bond Classification: Exposure 1.
  - 2. Span Rating: 40/20.
  - 3. Thickness: 5/8 inch, nominal for standing seam metal roofs, 2 layers of 3/8 inch, nominal for curved standing seam metal roofs and 3/4 inch for asphalt shingle roofs.
  - 4. Provide metal clip supports between sheets
- B. Other Applications: Thickness as noted on the drawings
  - 1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
  - 2. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
  - 3. Other Locations: PS 1, C-D Plugged or better.

#### **2.06 ACCESSORIES**

- A. Fasteners and Anchors:
  - 1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, stainless steel for fire retardant treated locations, unfinished steel elsewhere.
  - 2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
  - 3. Anchors: Expansion shield and lag bolt type for anchorage to solid masonry or concrete.
- B. Fasteners at Roof Nailers:

1. Wood Substrate: #10 stainless steel flat head screws, length as necessary to penetrate underlying wood support members a minimum of 1 1/4 inch. Each fastener to have a minimum pull out resistance of 100 pounds.
  - a. Bent plate for attaching vertical lumber at curbs: 18 gauge galvanized steel (G90) bent plate, fastened with stainless steel pancake head screws.
2. Metal Substrate: No. 12 Factory Mutual approved, fluorocarbon coated roofing screw.
3. Concrete or masonry surfaces: Series 400 stainless steel anchor with expansion shank, length as recommended by manufacturer for minimum 1,000 pound pull-out resistance.
4. Lightweight Fill Substrate: OMG Lite-Deck Fasteners (or approved equivalent) #TSFQ4, minimum length sufficient to provide manufacturer's minimum embedment into substrate for published resistances.
  - a. Shank diameter 0.312" minimum, thread diameter of 0.375" minimum.
  - b. Fastener shall be coated with a corrosion resistant coating. When subjected to 30 Kesternich cycles (DIN 50018), the fastener must show less than 15% red rust and surpass Factory Mutual Approval Standard 4470.
- C. Die-Stamped Connectors: Hot dipped galvanized steel, sized to suit framing conditions.
  1. For contact with preservative treated wood in exposed locations, provide minimum G185 galvanizing complying with ASTM A653/A653M.
- D. Joist Hangers: Hot dipped galvanized steel, sized to suit framing conditions.
  1. For contact with preservative treated wood in exposed locations, provide minimum G185 galvanizing complying with ASTM A653/A653M.
- E. Water-Resistive Barrier: As specified in Section 07 2500.

## **2.07 FACTORY WOOD TREATMENT**

- A. Treated Lumber and Plywood: Comply with requirements of AWWA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
  1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
  2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWWA standards.
- B. Fire Retardant Treatment:
  1. Exterior Type: AWWA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
    - a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
    - b. Treat all exterior rough carpentry items.
    - c. Do not use treated wood in direct contact with the ground.
  2. Interior Type A: AWWA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
    - a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
    - b. Treat rough carpentry items as indicated .
    - c. Do not use treated wood in applications exposed to weather or where the wood may become wet.
- C. Preservative Treatment:



1. Preservative Pressure Treatment of Lumber Above Grade: AWP A U1, Use Category UC3B, Commodity Specification A using waterborne preservative.
  - a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
  - b. Treat lumber exposed to weather.
  - c. Treat lumber in contact with roofing, flashing, or waterproofing.
  - d. Treat lumber in contact with masonry or concrete.
  - e. Treat lumber in other locations as indicated.
2. Preservative Pressure Treatment of Plywood Above Grade: AWP A U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative.
  - a. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
  - b. Treat plywood in contact with roofing, flashing, or waterproofing.
  - c. Treat plywood in contact with masonry or concrete.
  - d. Treat plywood in other locations as indicated.
3. Preservative Pressure Treatment of Lumber in Contact with Soil: AWP A U1, Use Category UC4A, Commodity Specification A using waterborne preservative.
  - a. Preservative for Field Application to Cut Surfaces: As recommended by manufacturer of factory treatment chemicals for brush-application in the field.
  - b. Restrictions: Do not use lumber or plywood treated with chromated copper arsenate (CCA) in exposed exterior applications subject to leaching.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Where wood framing bears on cementitious foundations, install full width sill flashing continuous over top of foundation, lap ends of flashing minimum of 4 inches and seal.
- B. Install sill gasket under sill plate of framed walls bearing on foundations; puncture gasket cleanly to fit tightly around protruding anchor bolts.
- C. Coordinate installation of rough carpentry members specified in other sections.

### **3.02 INSTALLATION - GENERAL**

- A. Select material sizes to minimize waste.
- B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
- C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

### **3.03 FRAMING INSTALLATION**

- A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength.
- B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.
- C. Install structural members full length without splices.
- D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes.
- E. Install horizontal spanning members with crown edge up and not less than 3 inches of bearing at each end.
- F. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed.
- G. Provide bridging at joists in excess of 8 feet span at mid-span. Fit solid blocking at ends of members.
- H. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

### **3.04 BLOCKING, NAILERS, AND SUPPORTS**

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
- B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.
- C. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.
- D. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
- E. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
- F. Blocking shall be Fire-Retardant Treated. Provide the following specific non-structural framing and blocking:
  - 1. Cabinets and shelf supports.
  - 2. Wall brackets.
  - 3. Handrails.
  - 4. Grab bars.
  - 5. Towel and bath accessories.
  - 6. Wall-mounted door stops.
  - 7. Chalkboards and marker boards.
  - 8. Wall paneling and trim.
  - 9. Joints of rigid wall coverings that occur between studs.

### **3.05 ROOF-RELATED CARPENTRY**

- A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.
- B. Provide wood curb at all roof openings except where prefabricated curbs are specified and where specifically indicated otherwise. Form corners by alternating lapping side members.
  - 1. Install new wood where indicated to provide total height of a minimum of 12 inches above the finished roof surface, allowing for height of insulation system, crickets, and coverboard, as applicable.
  - 2. Fasten securely to substrate.
  - 3. Treat surfaces exposed by cutting as recommended by preservative manufacturer.
  - 4. Fasten wood curb to nailer prior to installation with appropriate wood nailer fastener on 12-inch centers.
- C. Secure all roof nailers at copings and edges with two staggered rows of fasteners, spaced 12" o.c. maximum at wood or light gauge steel substrates, and 24" o.c. maximum at concrete, grouted masonry, or structural steel substrates.

### **3.06 INSTALLATION OF CONSTRUCTION PANELS**

- A. General: Comply with applicable recommendations contained in APA Form No. E30, "APA Design/Construction Guide: Residential & Commercial," for types of structural-use panels and applications indicated.
  - 1. Comply with "Code Plus" provisions of above-referenced guide.
- B. Comply with system manufacturer's written instructions for installing plywood.
  - 1. Install plywood sheathing continuously, with the strength of the axis of the panel across supports. Plywood sheathing shall be installed with offset joints. Butt end joints over supports, providing a space of 1/16" at panel ends and 1/8" at panel edges.

2. Fasten each layer of plywood sheathing using #13-14 Dekfast screws with Phillips drive truss heads in a noncorrosive base material in sufficient length to penetrate the metal decking by 1/2". Use a screw pattern of 6" spacing along exterior edges and a 12" interior grid pattern per UL90 class 580 uplift. Provide a minimum of 32 fasteners per sheet. Plywood shall be fastened as an independent system for the insulation. Where drawings indicate multiple layers of plywood, stagger second layer in both directions from pattern below. At curved roof structures, plywood shall conform to the radius of the structure.
3. Within 40 feet in any direction of any 4-hour firewall, install fire-retardant treated plywood sheathing.
4. Provide metal clip supports between sheets at center spans unless tongue and groove plywood sheathing is used.
5. Cover plywood sheathing as soon as possible with specified underlayment for protection against excessive moisture prior to roofing application.
6. Do not install plywood sheathing in adverse weather conditions. Plywood sheathing may be rejected by the Architect, whether or not it has been installed, for excessive warp, twist, crook, mildew, fungus, or mold as well as for improper curing and firming prior to installation. Wet or damaged plywood sheathing will be rejected.

### **3.07 SITE APPLIED WOOD TREATMENT**

- A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.
- B. Allow preservative to dry prior to erecting members.

### **3.08 TOLERANCES**

- A. Framing Members: 1/8 inch from true position, maximum.
- B. Surface Flatness of Floor: 1/8 inch in 10 feet maximum, and 3/8 inch in 30 feet maximum.
- C. Variation from Plane (Other than Floors): 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

### **3.09 CLEANING**

- A. Waste Disposal: Comply with the requirements of Section 01 7000.
  1. Comply with applicable regulations.
  2. Do not burn scrap on project site.
- B. Prevent sawdust and wood shavings from entering the storm drainage system.

**END OF SECTION**



**SECTION 06 2000  
FINISH CARPENTRY**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Finish carpentry items.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.
- B. Section 08 1416 - Flush Wood Doors.
- C. Section 09 9000 - Painting and Coating: Painting and finishing of finish carpentry items.

**1.03 REFERENCE STANDARDS**

- A. ANSI A135.4 - Basic Hardboard 2012 (Reaffirmed 2020).
- B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition 2014, with Errata (2016).
- C. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards 2021, with Errata.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.
- B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data:
  - 1. Provide data on fire retardant treatment materials and application instructions.
  - 2. Provide instructions for finish hardware.
- C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
  - 1. Scale of Drawings: 1-1/2 inch to 1 foot, minimum.
  - 2. Provide the information required by  $\{\rs\#1\}$ .
  - 3. Include certification program label.
- D. Samples: Submit two samples of finish plywood, 6 by 6 inch in size illustrating wood grain and specified finish.
- E. Samples: Submit two samples of wood trim 6 inches long.

**1.06 QUALITY ASSURANCE**

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
  - 1. Company with at least one project within the past 5 years with value of woodwork within 20 percent of cost of woodwork for this project.
  - 2. Single Source Responsibility: Provide and install this work from single fabricator.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver factory-fabricated units to project site in original packages, containers or bundles bearing brand name and identification.
- B. Store finish carpentry items under cover, elevated above grade, and in a dry, well-ventilated area not exposed to heat or sunlight.
- C. Protect from moisture damage.
- D. Handle materials and products to prevent damage to edges, ends, or surfaces.

## **PART 2 PRODUCTS**

### **2.01 FINISH CARPENTRY ITEMS**

- A. Quality Standard: Premium Grade, in accordance with AWI/AWMAC/WI (AWS), unless noted otherwise.
- B. Surface Burning Characteristics: Provide materials having fire and smoke properties as required by applicable code.

### **2.02 LUMBER MATERIALS**

- A. Hardwood Lumber: As noted on the drawings, with a maximum moisture content of 6 percent, of quality suitable for transparent finish.

### **2.03 SHEET MATERIALS**

- A. Hardwood Plywood: Face species as indicated, plain sawn, book matched, veneer core, glue type as recommended for application.
- B. Hardboard: ANSI A135.4; Pressed wood fiber with resin binder, Class 1 - Tempered, 1/4 inch thick, smooth one side (S1S).
- C. Pegboard: Pressed wood fiber with resin binder, standard grade; 1/4 inch thick, with holes spaced at 1 inch on center in both directions.

### **2.04 FASTENINGS**

- A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.
- B. Fastening:
  - 1. Install items straight, true, level, plumb, and firmly anchored in place.
  - 2. Where blocking or backing is required, coordinate as necessary with other trades to ensure placement of required backing and blocking in a timely manner.
  - 3. Nail trim with finish nails of proper dimension to hold the member firmly in place without splitting the wood.
  - 4. Nail exterior trim with galvanized nails, making joints to exclude water and setting in waterproof glue or the sealant described in Section 07 9200 - Joint Sealants of these Specifications.

### **2.05 FINISHING**

- A. Sand work smooth and set exposed nails and screws.
- B. Apply wood filler in exposed nail and screw indentations.
- C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.
- D. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and Section 09 9000-Painting and Coating.
- E. Back prime woodwork items to be field finished, prior to installation.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify adequacy of backing and support framing.
- B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

### **3.02 INSTALLATION**

- A. Install work in accordance with AWI/AWMAC/WI (AWS) requirements for grade indicated.
- B. Set and secure materials and components in place, plumb and level.

- C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.
- D. Install components with nails at 8 inch on center.

**3.03 PREPARATION FOR SITE FINISHING**

- A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.
- B. Site Finishing: See Section 09 9000.
- C. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

**3.04 TOLERANCES**

- A. Maximum Variation from True Position: 1/16 inch.
- B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

**END OF SECTION**





**SECTION 06 4219**  
**PLASTIC-LAMINATE-FACED WOOD PANELING**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Pre-manufactured panel system including mounting hardware and specified accessories.

**1.02 RELATED REQUIREMENTS**

- A. Related Documents: General and Supplementary Conditions of the Contract, Division 1 General Requirements, and Drawings are applicable to this Section.
- B. Section 06 1000 - Rough Carpentry
- C. Section 09 2982 - Gypsum Board

**1.03 REFERENCES**

- A. American National Standards Institute ANSI A 108.5
- B. American Society for Testing and Materials ASTM C 150
- C. American Woodwork Institute (AWI):
  - 1. Architectural Woodwork Quality Standards.

**1.04 SUBMITTALS**

- A. Shop drawings, product data, and samples under provisions of Section 01 3000 - Administrative Requirements.
- B. Shop Drawings:
  - 1. Materials list of items proposed to be provided under this Section.
  - 2. Indicate panel layout, color arrangement, perimeter conditions, and installation details.
  - 3. Locate and detail trim units.
  - 4. Where wall system is indicated to be fitted to other construction, check actual dimensions of other constructions by accurate field measurements before manufacturing wall system; show recorded measurements on final shop drawings. Coordinate manufacturing schedule with construction progress to avoid delay of work.
- C. Submit Material Safety Data Sheets under provisions of Section 01 7800 – Closeout Submittals for the following items:
  - 1. All mastics, glues, and adhesives
  - 2. Sealant (interior use only)
- D. Samples:
  - 1. Submit color samples illustrating full color.
  - 2. Trim profiles: Submit sample of each type and color.

**1.05 QUALITY ASSURANCE**

- A. Panel Manufacturer Qualifications: Firm experienced in successful production of wall system similar to that indicated for this project, with sufficient production capacity to produce required units without causing delay in the work.
- B. Installer Qualifications: Specializing in panel installation having minimum of five (5) years successful documented experience with work comparable to that required for this Project.
- C. Certifications: Certificates will be signed by Panel manufacturer certifying that products comply with specified requirements.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with requirements of Section 01 6000 Product Requirements.
- B. Protect wall system during transit, delivery, storage, and handling to prevent damage, soilage, and deterioration.

- C. Do not deliver wall system until painting, wet work, grinding, and similar operations that could damage, soil, or deteriorate wall system have been completed in installation areas. If wall system must be stored in other than installation areas, store only in areas meeting requirements specified in articles "Project Panel Conditions".
- D. If panels must be stored prior to installation, store them flat in completely enclosed areas, out of weather. Do not expose them to continuous direct sunlight, nor to extremes in temperature and humidity.
- E. Panels should be conditioned in the environment in which they will be installed for 48 hours prior to installation. The recommended environment is 75°F and 45% relative humidity

#### **1.07 ENVIRONMENTAL REQUIREMENTS**

- A. Comply with requirements of referenced standards and recommendations of material manufacturers for environmental conditions before, during, and after installation.
- B. Do not begin installation until building is completely enclosed and HVAC system is operating and maintaining temperature and humidity conditions consistent with "after occupancy" conditions for a minimum of 2 weeks.
- C. Ventilate spaces receiving tile in accordance with material manufacturers'
- D. Obtain and comply with Woodwork Manufacturer's and installer's coordinated advice for optimum temperature and humidity conditions for woodwork during its storage and installation. Do not install woodwork until these conditions have been attained and stabilized so that woodwork is within plus or minus 1.0 percent of optimum moisture content from date of installation through remainder of construction period.

#### **1.08 WARRANTY**

- A. Submit a written warranty, executed by the Contractor, Installer, and Manufacturer, agreeing to repair or replace laminated wall panels system that fails in materials or workmanship within the specified warranty period.
  - 1. Warranty Period: One (1) year after date of Substantial Completion.
  - 2. Supplier shall warrant all laminated panel wall systems against defects arising due to glue line failure for a period of five (5) years from the time of substantial completion.

#### **1.09 MAINTENANCE DATA**

- A. Submit maintenance data under provisions of Section 01 7000 – Execution and Closeout Requirements.
- B. Include cleaning methods, and recommended cleaning solutions.

### **PART 2 - PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Subject to compliance with requirements indicated herein, provide products of one of the listed manufacturers.
- B. High Pressure Laminate Wall Panels:
  - 1. Panel Specialists, Inc.: [www.panelspec.com](http://www.panelspec.com)
  - 2. Substitutions: See Section 01 6000 - Product Requirements.
- C. High Pressure Decorative Laminate: Refer to Section 01 6210 Schedule of Materials and Colors for approved color selections.
  - 1. Formica Corporation: [www.formica.com](http://www.formica.com).
  - 2. Panolam Industries International, Inc\Nevamar: [www.nevamar.com](http://www.nevamar.com).
  - 3. Wilsonart International, Inc: [www.wilsonart.com](http://www.wilsonart.com).
  - 4. Pionite Decorative Surfaces: [www.pionite.com](http://www.pionite.com).
  - 5. Substitutions: See Section 01 6000 - Product Requirements.

## **2.02 MATERIALS**

- A. Provide prefinished decorative panels where shown on the drawings, as specified herein, and as needed for a complete and proper installation.
- B. Panel Dimensions and Configurations: Refer to drawings.
- C. High Pressure Decorative Laminates (VGS,VGP,VGF & HGS) and non-decorative backers (BKV) used to surface wall panels systems shall be manufactured to meet or exceed the National Electrical Manufacturing Association (NEMA LD3-2005) for thickness, performance properties and appearance.
- D. Comply with applicable requirements of "Architectural Woodwork Quality Standards" in the production and installation of the wall panel system as published by the Architectural Woodwork Institute (AWI) unless otherwise indicated.
- E. Particleboard: 45# density shall be used in Class III panel composition. Fire-rated particle board shall be used for Class I and Class II panel compositions (refer to AWI Section 200)
- F. Medium Density Fiberboard (MDF): 45# density shall be used in Class III panel composition. Fire-rated MDF shall be used for Class I and Class II panel compositions (refer to AWI Section 200)
- G. Metal furring straps for vertical applications: Continuous, 18 gauge 3 1/2" wide metal strapping.
- H. Fire Rated Panels:
  - 1. Class 2/B - Flame Spread 26-75, Smoke Developed 450 or less.

## **2.03 HIGH PRESSURE LAMINATE WALL PANEL SYSTEM**

- A. Basis of Design: Panel Systems #310 as manufactured by Panel Specialists, Inc.
- B. PSI 310 System
  - 1. Application: Horizontal or Vertical
  - 2. Panel Thickness: 7/16"
  - 3. Moldings: 304 (also serves as Inside Corner), 304-A, 1/16" wide 302-A Divider, either 103L-90 degrees Outside Corner with 304-90 Top Cap or 103L-135 degrees Outside Corner with 304-135 Top Cap

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared according to AWI 1700-G-3.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### **3.02 INSTALLATION**

- A. To insure proper installation, installers shall be familiar with the manufacturer's recommended procedures. Install wall system to comply with AWI Section 1700 for same grade specified in part 2 of this section for type of woodwork involved.
- B. Field cutting of all wall systems shall be accomplished using carbide tools. All face penetrations shall have a minimal 1/8" radius according to NEMA standards.
- C. All wall systems shall receive an "S" bead of panel mastic on the back of the panel during installation.
- D. For vertical applications, all wall systems shall be mechanically fastened to horizontal furring strapping spaced 24" o.c. Furring straps shall be no less than 18 gauge 3 1/2" wide, continuously. Metal strapping to be installed to the drywall studs prior to the application of the gypsum board by the framing contractor. For horizontal applications, all of the above apply except furring straps may be optional.

### **3.03 CODES AND CERTIFICATES/FIRE PERFORMANCE CHARACTERISTICS**

- A. Decorative laminates (GP-30) and non-decorative backers (BK-28) used to surface wall panels systems are to be manufactured to meet or exceed relevant standards of the National Electrical Manufacturing Association (NEMA LD3-2000) for thickness, performance properties and appearance.
- B. Fire Performance Characteristics: Provided paneling composed of panels constructed with plastic laminate and fire-retardant particle board that are identical in construction to units tested for the following surface burning characteristics per ASTM E 84 by UL or other testing and inspecting organization acceptable to authorities having jurisdiction. Identify panels with appropriate markings of applicable testing and inspecting organization.
- C. Verify that areas to receive wall panels installed, are true within 1/4 inch in 10'-0".
- D. Air Temperature and Surfaces in Rooms to Receive Flooring: Between 60 degrees to 90 degrees F unless otherwise recommended by manufacturers of materials being installed.

### **3.04 CLEANING**

- A. After installation, clean as recommended by the manufacturer of the wall panel.

### **3.05 PROTECTION**

- A. Protect work so that it will be without any evidence of damage or use at time of acceptance.

**END OF SECTION**

**SECTION 06 6400**  
**TRANSLUCENT RESIN PANEL SYSTEMS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Translucent Resin Panel Systems

**1.02 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to this Section.

**1.03 SUBMITTALS**

- A. General: Submit the following in accordance with conditions of contract and Division 1 specification section 01 3000-Administrative Requirements.
- B. Product Data: Submit manufacturer's product data; include product description, fabrication information, and compliance with specified performance requirements.
- C. Submit product test reports from a qualified independent 3rd party testing agency indicating each type and class of panel system complies with the project performance requirements, based on comprehensive testing of current products. Previously completed test reports will be acceptable if for current manufacturer and indicative of products used on this project.
  - 1. Test reports required are:
    - a. Rate of Burning (ASTM D 635)
    - b. Self-Ignition Temperature (ASTM D 1929)
    - c. Density of Smoke (ASTM D 2843)
    - d. Flame spread and Smoke developed testing (ASTM E 84)
    - e. Room Corner Burn Test (NFPA 286)
    - f. Extent of Burning (UL 94)
    - g. Impact strength (ASTM D 3763)
    - h. Safety glazing impact resistance (ANSI Z97.1-2004)
    - i. UPIIT Test for Combustion Product Toxicity
    - j. Dynamic environmental testing (ASTM standards D 5116 and D 6670)
- D. Shop Drawings: Include plans, elevations, sections, panel dimensions, details, and attachments to other work.
- E. Samples for Initial Selection:
  - 1. Submit minimum 2-inch by 2-inch samples. Indicate full color, texture and pattern variation.
- F. Samples for Verification:
  - 1. Submit minimum 4-inch by 4-inch sample for each type, texture, pattern and color of solid plastic fabrication.
- G. Mockups:
  - 1. Build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects.
  - 2. Build mockup of each type of Plastic Fabrication.
  - 3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- H. Maintenance Data: Submit manufacturer's care and maintenance data, including care, repair and cleaning instructions. Include in Project closeout documents.

**1.04 QUALITY ASSURANCE**

- A. Manufacturers Qualifications

1. Materials and systems shall be manufactured by a company continuously and regularly employed in the manufacture of specified materials for a period of at least five (5) consecutive years and which can show evidence of those materials being satisfactorily used on at least six (6) projects of similar size, scope and location. At least three (3) of the projects shall have been successful for use five (5) years or longer.
2. Manufactured panels must be produced from a minimum of 40% post-industrial recycle content. This recycle content must be certified by a recognized 3rd party certification group, such as Scientific Certification Systems (SCS).
3. Manufacturer must offer a documented reclaim process that will take back, at the manufacturers cost, panels that are at their end-of life cycle. Return process is preceded by following requirements highlighted in Section 02 42 00 Removal and Salvage of Construction Materials.

#### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver Plastic Fabrications, systems and specified items in manufacturer's standard protective packaging.
- B. Do not deliver Plastic Fabrications, system, components and accessories to Project site until areas are ready for installation.
- C. Store materials in a flat orientation in a dry place that is not exposed to exterior elements.
- D. Handle materials to prevent damage to finished surfaces. Provide protective coverings to prevent damage or staining following installation for duration of project.
- E. Before installing Plastic Fabrications, permit them to reach room temperature.

#### **1.06 PROJECT CONDITIONS**

- A. Environmental Limitations: Do not install Solid Polymer Fabrications until spaces are enclosed and weatherproof, and ambient temperatures and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

#### **1.07 WARRANTY**

- A. Manufacturer's Special Warranty on Plastic Fabrications: Manufacturer's standard form agreeing to repair or replace units that fail in material or workmanship within the specified warranty period.
- B. Warranty Period: 2 year after the date of substantial completion.
- C. The warranty shall not deprive the owner of other rights or remedies the Owner may have under other provisions of the Contract Documents, and is in addition to and runs concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURER**

- A. Manufacturer: 3form, Inc.: [www.3-form.com](http://www.3-form.com)
- B. Substitutions: See Section 01 6000 – Product Requirements.

#### **2.02 MATERIALS**

- A. Basis of Design: 3form Panel - Refer to Schedule of Materials and Colors for specific product line and color.
  1. Engineered polyester resin
  2. Sheet Size: Maximum 4' x 10'
  3. Thickness: Minimum 1/4"
- B. Interlayer Materials: Compatible with polyesters and bonding process to create a monolithic sheet of material when complete.
- C. Sheet minimum performance attributes:

1. Rate of Burning (ASTM D 635). Material must attain CC1 Rating for a nominal thickness of 1.5 mm (0.060 in.) and greater.
2. Self-Ignition Temperature (ASTM D 1929). Material must have a Self-ignition temperature greater than 650°F.
3. Density of Smoke (ASTM D 2843). Material must have a smoke density less than 75%.
4. Flame spread and Smoke developed testing (ASTM E 84). Material must be able to meet a level of Class A (Flame spread less than 25 and smoke less than 450) at thickness of 1".
5. Room Corner Burn Test (NFPA 286). Material must meet Class A criteria at 1/4" thickness as described by the International Building Code.
6. Extent of Burning (UL 94). Must submit UL card.
7. Impact strength. Minimum impact strength test as measured by ASTM D 3763 of 20 ft. lbs. (for durability, shipping, installation, and use).
8. Safety Glazing. Material must attain a Class A impact rating in accordance with ANSI Z97.1-2004 at 1/8" thickness.
9. UPIIT Test for Combustion Product Toxicity: Product must be recorded as "not more toxic than wood".
10. Dynamic environmental testing (ASTM standards D 5116 and D 6670). Panels must not have detectable VOC off-gassing agents and must be have Greenguard™ Indoor Air Quality certified.
11. Panels must be produced from a minimum of 40% post-industrial recycle content. This recycle content must be certified by a recognized 3rd party certification group, such as Scientific Certification Systems (SCS).

## **2.03 FABRICATION**

- A. General: Fabricate Plastic Fabrications to designs, sizes and thicknesses indicated and to comply with indicated standards. Sizes, profiles and other characteristics are indicated on the drawings.
- B. Comply with manufacturer's written recommendations for fabrication.
- C. Machining: Acceptable means of machining are listed below. Ensure that material is not chipped or warped by machining operations.
  1. Sawing: Select equipment and blades suitable for type of cut required.
  2. Drilling: Drills specifically designed for use with plastic products.
  3. Milling: Climb cut where possible.
  4. Routing
  5. Tapping
- D. Forming: Form products to shapes indicated using the appropriate method listed below. Comply with manufacturer's written instructions.
  1. Cold Bending
  2. Hot Bending
  3. Thermoforming: Acceptable only on uncoated material.
  4. Drape Forming
  5. Matched Mold Forming
  6. Mechanical Forming
- E. Laminating: Laminate to substrates indicated using adhesives and techniques recommended by manufacturer.

## **2.04 MISCELLANEOUS MATERIALS**

- A. General: Provide products of material, size, and shape required for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaner: Type recommended by manufacturer.
- C. Fasteners: Use screws designed specifically for plastics. Self-threading screws are acceptable for permanent installations. Provide threaded metal inserts for applications requiring frequent disassembly such as light fixtures.

- D. Bonding Cements: May be achieved with solvents or adhesives, suitable for use with product and application.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions where installation of Plastic Fabrications will occur, with Installer present, for compliance with manufacturer's requirements. Verify that substrates and conditions are satisfactory for installation and comply with requirements specified.

#### **3.02 INSTALLATION**

- A. General: Comply with manufacturer's written instructions for the installation of Plastic Fabrications.
- B. Manufacturer's shop to fabricate items to the greatest degree possible.
- C. Utilize fasteners, adhesives and bonding agents recommended by manufacturer for type of installation indicated. Material that is chipped, warped, hazed or discolored as a result of installation or fabrication methods will be rejected.
- D. Install components plumb, level and rigid, scribed to adjacent finishes, in accordance with approved shop drawings and product data.
- E. Form field joints using manufacturer's recommended procedures. Locate seams in panels so that they are not directly in line with seams in substrates.

#### **3.03 CLEANING AND PROTECTION**

- A. Protect surfaces from damage until date of substantial completion. Repair work or replace damaged work, which cannot be repaired to Architect's satisfaction.

**END OF SECTION**



**SECTION 06 8316**  
**FIBERGLASS REINFORCED PANELING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Fiberglass reinforced plastic panels.
- B. Trim.

**1.02 REFERENCE STANDARDS**

- A. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics 2023, with Editorial Revision.
- B. ASTM D2583 - Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor 2013a.
- C. ASTM D5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels 2022.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023b.
- E. FM 4880 - Evaluating the Fire Performance of Insulated Building Panel Assemblies and Interior Finish Materials 2017.

**1.03 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Samples: Submit two samples 8 by 10 inch in size illustrating material and surface design of panels.
- D. Submit Material Safety Data Sheets for the following items:
  - 1. All mastics, glues and adhesives
  - 2. Sealant (interior use only)

**1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Store panels flat, indoors, on a clean, dry surface. Remove packaging and allow panels to acclimate to room temperature for 48 hours prior to installation.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Fiberglass Reinforced Plastic Panels:
  - 1. Crane Composites, Inc: [www.cranecomposites.com/#sle](http://www.cranecomposites.com/#sle).
  - 2. Marlite, Inc: [www.marlite.com/#sle](http://www.marlite.com/#sle).
  - 3. Nudo Products, Inc: [www.nudo.com/#sle](http://www.nudo.com/#sle).
  - 4. Panolam Industries International, Inc: [www.panolam.com/#sle](http://www.panolam.com/#sle).
  - 5. Substitutions: See Section 01 6000 - Product Requirements.

**2.02 PANEL SYSTEMS**

- A. Wall Panels at drywall partitions behind service sinks:
  - 1. Panel Size: 4 by 8 feet.
  - 2. Panel Thickness: 0.075 inch.
  - 3. Surface Design: Smooth.
  - 4. Color: White.
  - 5. Attachment Method: Adhesive only, with trim and sealant in joints.

## **2.03 MATERIALS**

- A. Panels: Fiberglass reinforced plastic (FRP), complying with ASTM D5319.
  - 1. Surface Burning Characteristics: Maximum flame spread index of 25 and smoke developed index of 450; when system tested in accordance with ASTM E84.
  - 2. Class 1 fire rated when tested in accordance with FM 4880.
  - 3. Scratch Resistance: Barcol hardness score greater than 50, when tested in accordance with ASTM D2583.
  - 4. Impact Strength: Greater than 6 ft lb force per inch, when tested in accordance with ASTM D256.
- B. Trim: Vinyl; color coordinating with panel.
- C. Adhesive: Type recommended by panel manufacturer.
- D. Sealant: Type recommended by panel manufacturer; white.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions and substrate flatness before starting work.
- B. Verify that substrate conditions are ready to receive the work of this section.

### **3.02 INSTALLATION - WALLS**

- A. Install panels in accordance with manufacturer's instructions.
- B. Cut and drill panels with carbide tipped saw blades, drill bits, or snips.
- C. Apply adhesive to the back side of the panel using trowel as recommended by adhesive manufacturer.
- D. Apply panels to wall with seams plumb and pattern aligned with adjoining panels.
- E. Install panels with manufacturer's recommended gap for panel field and corner joints.
- F. Place trim on panel before fastening edges, as required.
- G. Fill channels in trim with sealant before attaching to panel.
- H. Install trim with adhesive and screws or nails, as required.
- I. Seal gaps at floor, ceiling, and between panels with applicable sealant to prevent moisture intrusion.
- J. Remove excess sealant after paneling is installed and prior to curing.

**END OF SECTION**

**SECTION 07 1300  
SHEET WATERPROOFING**

**PART 1 - GENERAL**

**1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.02 RELATED SECTIONS - INCLUDE, BUT NOT LIMITED TO THE FOLLOWING:**

- A. Section 033000 – Cast-In-Place Concrete

**1.03 SECTION INCLUDES:**

- A. Installation of blindside and pre-applied sheet waterproofing systems at locations as indicated on drawings.

**1.04 REFERENCES**

- A. Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method

**1.05 SUBMITTALS**

- A. General: Submit in accordance with Section 01 3000.
- B. Product Data: Submit manufacturer's product literature and installation instructions for each material specified.
  - 1. Include material descriptions and tested physical and performance properties of waterproofing.
  - 2. Include project-specific construction details and shop drawings showing transitions to adjacent construction materials, including, but not limited to: pre-applied membrane to post-applied membrane and post-applied membrane to underslab vapor retarder.
  - 3. Include manufacturer's written instructions for evaluating, preparing and treating substrate.
- C. Subcontractor's approval by Manufacturer: Submit document stating manufacturer's acceptance of subcontractor as an Approved Applicator for the specified materials.
- D. Submit list of proposed project personnel, including Subcontractor's Project Manager, Supervisor, and Foreman, with a list of completed waterproofing projects for each. Indicate date of each project with a general description of the type of waterproofing installed and the facility size and use.
- E. Warranty: Submit a sample warranty identifying the terms and conditions stated in Section 1.7.

**1.06 QUALITY ASSURANCE**

- A. Applicator Qualifications:
  - 1. Applicator shall be experienced in applying the same or similar materials and shall be specifically approved in writing by the membrane system manufacturer for a minimum of five (5) years prior to the bid date.
  - 2. Applicator shall provide a full time supervisor at all times that the work of this Section is in progress. Supervisor shall have a minimum of three (3) years of successful project experience supervising projects of similar materials and scope, and shall be an employee of the Applicator.
- B. Pre-Application Conference:
  - 1. Prior to beginning work, Contractor shall convene a conference to review project conditions with Architect, Waterproofing Consultant, concrete subcontractor, and any other affected trades.
  - 2. Agenda will include discussion of:

- a. Review waterproofing requirements including surface preparation, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details and sheet flashings, installation procedures, testing and inspection procedures, quality assurance documentation, protection and repairs, schedules, and coordination with other work.
- C. NOTE: If additional site visits are required by Architect's Consultant as a result of noncompliant waterproofing system installation, these shall be provided at Contractor's expense.

#### **1.07 WARRANTY**

- A. Installer's Warranty: Two (2) Years, from date of completion and acceptance of the work required by this section, agreeing to promptly replace or otherwise repair defective waterproofing materials.
- B. Manufacturer's Warranty: Upon completion and acceptance of the work required by this section, the manufacturer will issue a ten (10) year materials warranty, agreeing to promptly replace or otherwise repair defective materials.

#### **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials to project site in original, factory-sealed, unopened containers bearing manufacturer's name and label intact and legible with following information.
  - 1. Name of material.
  - 2. Manufacturer's stock number and date of manufacture.
  - 3. Material safety data sheet.
- B. Store materials in protected and well-ventilated area, within the manufacturer's acceptable range of temperatures.

#### **1.09 PROJECT CONDITIONS**

- A. Do not apply membrane if temperature is less than 40 degrees F (unless approved by membrane manufacturer), if precipitation is imminent, or the surface is wet or has frost.
- B. Coordinate waterproofing work with other trades to ensure adequate illumination, ventilation, and dust-free environment during application and curing of membrane. The applicator shall have sole right of access to the specified areas for the time needed to complete the application and allow the membrane to cure adequately.
- C. Coordination between various trades is essential to avoid unnecessary damage to the membrane.
- D. Protect adjoining surfaces not to be coated against damage or soiling. Protect plants, vegetation and animals which might be affected by waterproofing operations.
- E. Applicator shall provide applicable protective clothing and respiratory protection gear.
- F. Maintain work area in a neat and orderly condition, removing empty containers, rags, and rubbish daily from the site.

### **PART 2 - PRODUCTS**

#### **2.01 MATERIALS, GENERAL**

- A. Source Limitations for Waterproofing System: Obtain waterproofing materials and protection/drainage panels from single source from single source manufacturer.

#### **2.02 BLINDSIDE (PRE-APPLIED) WATERPROOFING SYSTEMS**

- A. CCW-MiraPLY-H by Carlisle Coatings and Waterproofing
- B. Pre-Prufe 300R Plus by GCP Applied Technologies
- C. TREMproof Amphibia by Tremco Commercial Sealants and Waterproofing
- D. Approved pre-bid equivalent. Substitutions after bid date will not be considered.

### **2.03 POST-APPLIED SHEET MEMEBRANE WATERPROOFING SYSTEMS**

- A. CCW-MiraDRI 860/861 by Carlisle Coatings and Waterproofing
- B. Bituthene 4000 by GCP Applied Technologies
- C. TREMproof 560 by Tremco Commercial Sealants and Waterproofing
- D. Approved pre-bid equivalent. Substitutions after bid date will not be considered.

### **2.04 ACCESSORY PRODUCTS**

- A. Provide the following accessories, supplied by and recommended by waterproofing membrane manufacturer.
  - 1. Seam Tape and detailing tapes
  - 2. Primers: suitable for substrate encountered and membrane specified, as recommended by waterproofing membrane manufacturer.
  - 3. Surface Conditioner: liquid, waterborne surface conditioner as recommended by waterproofing membrane manufacturer.
  - 4. Termination, Detail, Lap, and Membrane Sealants by waterproofing membrane manufacturer.
  - 5. Liquid Membrane: Elastomeric, two-component liquid, cold fluid applied, of trowel grade or low viscosity.
  - 6. Reinforcing Fabric.
  - 7. Termination Bar: 1" stainless steel termination bar, holes pre-punched at six inches maximum on center.
  - 8. Waterstop: Self-adhering butyl rubber/bentonite joint compound, CCW Mirastop, GCP Adcor ES, Tremco Superstop, or equivalent, provided by waterproofing system manufacturer.
  - 9. Protection/Drainage Composite Course: waterproofing manufacturer's geo-textile-faced, molded sheet drainage panel and protection board for vertical surfaces, as recommended by the manufacturer.
  - 10. Cleaner: Manufacturer's standard membrane cleaner.
  - 11. Reinforcing Membrane/Flashing provided by manufacturer.

## **PART 3 - EXECUTION**

### **3.01 WATERSTOP INSTALLATION**

- A. Prior to installing any concrete components creating a discontinuity at surfaces to receive waterproofing, provide installation of waterstop at horizontal member, in accordance with manufacturer requirements.

### **3.02 INSPECTION – GENERAL**

- A. Before any waterproofing work is started the waterproofing applicator shall thoroughly examine all surfaces for any deficiencies. Should any deficiencies exist, the architect, owner, or general contractor shall be notified in writing and corrections made prior to membrane installation.
- B. All work shall be performed in accordance with manufacturer application instructions.

### **3.03 INSPECTION FOR BLINDSIDE WATERPROOFING**

- A. Verify that the compacted subgrade is dry, smooth, sound, and ready to receive waterproofing sheet.
  - 1. The substrate must be relatively even without noticeable high spots or depressions, relatively smooth, free of protrusions, debris, sharp edges or foreign materials and must be free of accumulated water, ice and snow.
  - 2. Gaps or voids greater than 2 inches in lagging or excavated substrate shall be filled with non-shrink grout prior to proceeding with waterproofing installation.

### **3.04 INSPECTION FOR POST-APPLIED SHEET MEMBRANE WATERPROOFING**

- A. Verify that concrete has cured and aged for minimum time period recommended in writing by waterproofing manufacturer.
- B. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method according to ASTM D 4263.

### **3.05 BLINDSIDE WATERPROOFING INSTALLATION**

- A. Install membrane in full accordance with manufacturer installation requirements and recommendations, except where more stringent requirements are provided in the Drawings and/or Specifications.
- B. Apply the blindside membrane with bonding surface of the membrane facing inward toward area where the concrete will be poured. Fasten top edge of membrane to formwork as needed. Location and spacing of fasteners shall be per manufacturer requirements.
- C. Carefully position successive sheets to overlap the previous sheet by 3 in. minimum along the lap line, or the minimum lap required by the manufacturer if greater than 3 inches. Ensure the product lays flat with no openings.
  - 1. End laps must be staggered and installed shingle fashion toward the exterior side of the membrane.
  - 2. Surface of lap area shall be cleaned per manufacturer's instructions prior to adhesion of materials.
- D. Remove release liner (if present) on the lap edge of the sheet and mate the two sheets together. Lap area shall be rolled with firm hand pressure.
- E. After full installation completely remove the plastic liner (if present) prior to concrete placement. Within 24 hours of concrete pour, reinspect waterproofing membrane surface for debris and damage.
  - 1. Remove dust and other materials observed, by using pressurized air or water as required to provide a clean membrane system, in full accordance with manufacturer's requirements.
  - 2. Repair all damage observed immediately and in full accordance with manufacturer's requirements.
  - 3. Do not pour concrete in areas where membrane is damaged or where laps are not fully sealed. Do not pour concrete in areas that have not been inspected by Engineer.

### **3.06 SURFACE PREPARATION FOR POST-APPLIED SHEET MEMBRANE WATERPROOFING**

- A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.
- B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids.
- E. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks.
  - 1. Install sheet strips of width according to manufacturer's written instructions and center over treated construction and contraction joints and cracks exceeding a width of 1/16 inch (1.6 mm).
- F. Bridge and cover isolation joints, expansion joints, and discontinuous deck-to-wall and deck-to-deck joints with overlapping sheet strips of widths according to manufacturer's written instructions.

1. Invert and loosely lay first sheet strip over center of joint. Firmly adhere second sheet strip to first and overlap to substrate.
- G. Corners: Prepare, prime, and treat inside and outside corners:
  1. Install membrane strips centered over vertical inside corners. Install 3/4-inch (19-mm) fillets of liquid membrane on horizontal inside corners and as follows:
    - a. At footing-to-wall intersections, extend liquid membrane in each direction from corner or install membrane strip centered over corner.
- H. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through waterproofing and at drains and protrusions.

### **3.07 POST-APPLIED SHEET MEMBRANE WATERPROOFING INSTALLATION**

- A. Install membrane in full accordance with manufacturer installation requirements and recommendations, except where more stringent requirements are provided in the Drawings and/or Specifications.
- B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.
- C. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch- (64-mm-) minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure watertight installation.
  1. When ambient and substrate temperatures range between 25 and 40 deg F (minus 4 and plus 5 deg C), install self-adhering, modified bituminous sheets produced for low-temperature application. Do not use low-temperature sheets if ambient or substrate temperature is higher than 60 deg F (16 deg C).
- D. Apply continuous sheets over already-installed sheet strips, bridging substrate cracks, construction, and contraction joints.
- E. Seal edges of sheet-waterproofing terminations with mastic.
- F. Install sheet-waterproofing and auxiliary materials to tie into adjacent waterproofing and vapor barrier per manufacturers' recommendations and approved Shop Drawings.
- G. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches (150 mm) beyond repaired areas in all directions.
- H. Install protection/drainage composite after waterproofing installation has been observed by Waterproofing Consultant.

### **3.08 MOLDED-SHEET DRAINAGE PANEL INSTALLATION**

- A. Place and secure molded-sheet drainage panels, with geotextile facing away from wall or deck substrate, according to manufacturer's written instructions. Use adhesives or other methods that do not penetrate waterproofing. Lap edges and ends of geotextile to maintain continuity. Protect installed molded-sheet drainage panels during subsequent construction.

### **3.09 PROTECTION, REPAIR, AND CLEANING**

- A. Protect waterproofing from damage and wear during remainder of construction period.
- B. Protect installed materials from damage due to UV light, harmful weather exposures, physical abuse, and other causes.
- C. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.
- D. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

**END OF SECTION**





**SECTION 07 1413**  
**HOT FLUID-APPLIED RUBBERIZED ASPHALT WATERPROOFING**

**PART 1 – GENERAL**

**1.01 SECTION INCLUDES**

- A. Rubberized-asphalt waterproofing membrane, reinforced.
- B. Molded-sheet drainage panels.
- C. Insulation.

**1.02 ACTION SUBMITTALS**

- A. Product Data: For each type of product. Include manufacturer's written instructions for evaluating, preparing, and treating substrate, technical data, and tested physical and performance properties of waterproofing.
- B. Shop Drawings:
  - 1. Waterproofing: Show locations and extent of waterproofing. Include details for substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins to adjoining waterproofing, and other termination conditions.

**1.03 INFORMATIONAL SUBMITTALS**

- A. Qualifications:
  - 1. Electronic Leak Detection Testing:
    - a. Testing Firm Qualifications: Approved or certified by electronic leak detection system manufacturer, with minimum five year record of satisfactory experience.
  - 2. Waterproofing Installer Certifications:
    - a. Subcontractor's approval by Manufacturer: Submit document stating manufacturer's acceptance of subcontractor as an Approved Applicator for the specified materials.
    - b. Submit list of proposed project personnel, including Subcontractor's Project Manager, Supervisor, and Foreman, with a list of completed waterproofing projects for each. Indicate date of each project with a general description of the type of waterproofing installed and the facility size and use.
  - 3. Field Quality Control Reports
    - a. Electronic Leak Detection: Digital drawings, digital photographic documentation, and written report detailing location and nature of membrane breaches, defects found, and verification of corrective actions taken.
    - b. Waterproofing: Provide daily report documenting installation and quality control procedures performed in accordance with these specifications.
  - 4. Warranty: Submit a sample warranty identifying the terms and conditions stated in this Section.

**1.04 CLOSEOUT SUBMITTALS**

- A. Record Drawings:
  - 1. Drawings, photographic documentation, and written report detailing installed location of components of membrane system.

**1.05 QUALITY ASSURANCE**

- A. Coordination:
  - 1. Integrate layout of membrane with surrounding structure and penetrations for building utilities and services.
- B. Applicator Qualifications:
  - 1. Applicator shall be experienced in applying the same or similar materials and shall be specifically approved in writing by the membrane system manufacturer for a minimum of five (5) years prior to the bid date.

2. Applicator shall provide a full-time supervisor at all times that the work of this Section is in progress. Supervisor shall have a minimum of three (3) years of successful project experience supervising projects of similar materials and scope, and shall be an employee of the Applicator.
- C. Pre-Application Conference:
  1. Prior to beginning work, Contractor shall convene a conference to review project conditions with Architect and Waterproofing Consultant.
  2. Agenda will include discussion of:
    - a. Installation procedures
    - b. Quality assurance documentation and testing
    - c. Schedules
    - d. Coordination with other work
    - e. Protection of installed waterproofing.
  3. Applicator shall continuously monitor the thickness of waterproofing application throughout the project and document wet mil thickness readings in daily reports to Architect.
  4. Applicator will repair dry mil thickness readings taken by Architect's Consultant at a minimum of four (4) locations per 500 s.f. of waterproofing or per area of waterproofing if less than 500 s.f. Repairs of mil thickness readings taken through the protection mat will require removal of the mat for a full depth repair.
  5. If dry mil thickness readings do not comply with the minimum mils specified, Applicator shall prepare and install additional waterproofing to achieve the minimum thickness and provide repairs at additional dry mil thickness test cut locations to verify compliance.
    - a. NOTE: If additional site visits are required by Architect's Consultant as a result of noncompliant waterproofing system thickness, these shall be provided at Contractor's expense.

#### **1.06 DELIVERY, STORAGE AND HANDLING**

- A. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by waterproofing manufacturer.
- B. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- C. Protect stored materials from direct sunlight.

#### **1.07 FIELD CONDITIONS**

- A. Weather Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate, or when temperature is below zero deg F (minus 18 deg C).
  1. Do not apply waterproofing in snow, rain, fog, or mist.
- B. Coordinate waterproofing work with other trades to ensure adequate illumination, ventilation, and dust-free environment during application and curing of membrane. The applicator shall have sole right of access to the specified areas for the time needed to complete the application and allow the membrane to cure adequately.
- C. Protect adjoining surfaces not to be coated against damage or soiling.
- D. Applicator shall provide applicable protective clothing and respiratory protection gear.
- E. Maintain work area in a neat and orderly condition, removing empty containers, rags, and rubbish daily from the site.

#### **1.08 WARRANTY**

- A. Special Warranty: Manufacturer agrees to repair or replace waterproofing and sheet flashings that do not comply with requirements or that fail to remain watertight within specified warranty period.
  1. Warranty includes No Dollar Limit coverage for removing and reinstalling protection board, drainage panels, insulation, pedestals, and pedestal-mounted pavers on plaza decks.
  2. Warranty insulation retains 80 percent of original published thermal value.

3. Warranty pavers do not dish or warp and do not crack, split, or disintegrate in freeze-thaw conditions.
4. Warranty Period: Twenty (20) years from date of Substantial Completion.
- B. Special Installer's Warranty: Specified form, signed by Installer, covering Work of this Section, for warranty period of two years.
  1. Warranty includes removing and reinstalling protection board, drainage panels, insulation, pedestals, and pedestal-mounted pavers on plaza decks.
- C. Pro-rated warranties will not be accepted.
- D. Warranty shall be transferrable.
- E. Minimum 30 day reporting period for the owner.

## **PART 2 - PRODUCTS**

### **2.01 WATERPROOFING MEMBRANE**

- A. Hot Fluid-Applied, Rubberized-Asphalt Waterproofing Membrane: Single component; 100 percent solids; hot fluid-applied, rubberized asphalt.
  1. Products: Subject to compliance with requirements, provide one of the following:
    - a. American Hydrotech, Inc; Monolithic Membrane 6125.
    - b. Carlisle Coatings & Waterproofing Inc; CCW-500R.
    - c. Tremco Incorporated; Tremproof 6100.
    - d. Approved equivalent.

### **2.02 AUXILIARY MATERIALS**

- A. General: Auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with waterproofing.
- B. Primer: ASTM D 41/D 41M, asphaltic primer.
- C. Elastomeric Sheet: 50-mil- (1.3-mm-) minimum, uncured sheet neoprene with manufacturer's recommended contact adhesives as follows:
  1. Tensile Strength: 1400 psi (9.6 MPa) minimum; ASTM D 412, Die C.
  2. Elongation: 300 percent minimum; ASTM D 412.
  3. Tear Resistance: 125 psi (860 kPa) minimum; ASTM D 624, Die C.
  4. Brittleness: Does not break at minus 30 deg F (34 deg C); ASTM D 2137.
- D. Two-component, liquid applied poly methyl-methacrylate (PMMA) resin membrane flashing system.
- E. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum termination bars; approximately 1 by 1/8 inch (25 by 3 mm) thick; with stainless-steel anchors.
- F. Sealants and Accessories: Manufacturer's recommended sealants and accessories.
- G. Reinforcing Fabric: Manufacturer's recommended, spun-bonded polyester fabric.
- H. Protection Course: ASTM D 6506, semi-rigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners and as follows:
  1. Thickness: 1/8 inch (3 mm), nominal, for vertical applications; 1/4 inch (6 mm), nominal, elsewhere.
- I. Filter Fabric: Nonwoven, needle-punched geotextile made of 100% polypropylene staple filaments; US Fabrics, 100NW or approved equivalent.

### **2.03 MOLDED-SHEET DRAINAGE PANELS**

- A. Woven-Geotextile-Faced, Molded-Sheet Drainage Panel: Prefabricated composite subsurface drainage panels consisting of a woven-geotextile facing with an apparent opening size not exceeding No. 40 (0.43-mm) sieve, laminated to one side with a polymeric film bonded to the other side of a studded, nonbiodegradable, molded-plastic-sheet drainage core, with a horizontal flow rate not less than 2.8 gpm/ft.

- B. Basis of Design: Tremco TREMDrain S.

## **2.04 INSULATION AND FILTER FABRIC**

- A. Board Insulation: Extruded-polystyrene board insulation complying with ASTM C 578, Type VII, 60-psi (414-kPa) minimum compressive resistance, square edged.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Dow Chemical Company (The).
    - b. Owens Corning.
- B. Filter Fabric: Non-woven, polypropylene geotextile fabric with a random three-dimensional pore structure, TerraTex N04 by Hanes Geocomponents or equivalent. Minimum properties:
1. Tensile Strength (ASTM D-4632): 90 lbs
  2. Puncture Strength (ASTM D-4833): 60 lbs
  3. Water Flow Rate (ASTM D-4491): 150 g/m/sf

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
1. Verify that concrete has cured and aged for minimum time period recommended by waterproofing manufacturer.
  2. Test and verify the concrete moisture content is within the requirements of the waterproofing manufacturer.
  3. Verify that substrate is visibly dry and free of moisture and frost. Test for capillary moisture by plastic sheet method according to ASTM D 4263 and as recommended by the manufacturer.
  4. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Clean and prepare substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for waterproofing application.
- B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.
- C. Close off deck drains and other deck penetrations to prevent spillage and migration of waterproofing fluids.
- D. Remove grease, oil, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
1. Abrasive blast clean concrete surfaces uniformly to expose top surface of fine aggregate according to ASTM D 4259 with a self-contained, recirculating, blast-cleaning apparatus. Remove material to provide a sound surface free of laitance, glaze, efflorescence, curing compounds, concrete hardeners, or form-release agents. Remove remaining loose material and clean surfaces according to ASTM D 4258.
- E. Remove fins, ridges, and other projections, and fill honeycomb, aggregate pockets, and other voids.

### **3.03 JOINTS, CRACKS, AND TERMINATIONS**

- A. Prepare and treat substrates to receive waterproofing membrane, including joints and cracks, deck drains, corners, and penetrations according to manufacturer's written instructions.
1. Rout and fill joints and cracks in substrate. Before filling, remove dust and dirt according to ASTM D 4258.

2. Adhere strip of elastomeric sheet to substrate in a layer of hot rubberized asphalt. Extend elastomeric sheet a minimum of 6 inches (150 mm) on each side of moving joints and cracks or joints and cracks exceeding 1/8 inch (3 mm) thick, and beyond deck drains and penetrations. Apply second layer of hot fluid-applied, rubberized asphalt over elastomeric sheet.
3. Embed strip of reinforcing fabric into a layer of hot rubberized asphalt. Extend reinforcing fabric a minimum of 6 inches (150 mm) on each side of nonmoving joints and cracks not exceeding 1/8 inch (3 mm) thick, and beyond roof drains and penetrations.
  - a. Apply second layer of hot fluid-applied, rubberized asphalt over reinforcing fabric.
4. At expansion joints and discontinuous deck-to-wall or deck-to-deck joints, bridge joints with elastomeric sheet extended a minimum of 6 inches (150 mm) on each side of joints and adhere to substrates in a layer of hot rubberized asphalt. Apply second layer of hot fluid-applied, rubberized asphalt over elastomeric sheet.

#### **3.04 FLASHING INSTALLATION**

- A. Verify that penetrations are located such that a minimum clearance of 12 inches (300 mm) is provided.
- B. Install elastomeric sheets at terminations of waterproofing membrane according to manufacturer's written instructions.
- C. Prime substrate with asphalt primer.
- D. Install elastomeric sheet and adhere to deck and wall substrates in a layer of hot rubberized asphalt.
- E. Extend elastomeric sheet up walls or parapets a minimum of 8 inches (200 mm) above deck and 6 inches (150 mm) onto deck to be waterproofed, or to minimum dimension noted in drawing details, whichever is more stringent.
- F. Install termination bars and mechanically fasten to top of elastomeric flashing sheet at terminations and perimeter of waterproofing.

#### **3.05 MEMBRANE APPLICATION**

- A. Apply primer, at manufacturer's recommended rate, over prepared substrate and allow it to dry.
- B. Heat and apply rubberized asphalt according to manufacturer's written instructions.
  1. Heat rubberized asphalt in an oil- or air-jacketed melter with mechanical agitator specifically designed for heating rubberized asphalt.
- C. Start application with manufacturer's authorized representative present.
- D. Reinforced Membrane: Apply hot rubberized asphalt to substrates and adjoining surfaces indicated. Spread to a thickness of 90 mils (2.3 mm); embed reinforcing fabric, overlapping sheets 2 inches (50 mm); spread another 125-mil- (3.2-mm-) thick layer to provide a uniform, reinforced, seamless membrane 215 mils (5.5 mm) thick.
- E. Apply waterproofing over prepared joints and up wall terminations and vertical surfaces to heights indicated or required by manufacturer.
- F. Cover waterproofing with protection course with overlapped joints before membrane is subject to construction traffic.

#### **3.06 MOLDED-SHEET DRAINAGE PANEL INSTALLATION**

- A. Place and secure molded-sheet drainage panels, with geotextile facing away from wall or deck substrate according to manufacturer's written instructions. Use methods that do not penetrate waterproofing. Lap edges and ends of geotextile to maintain continuity. Protect installed molded-sheet drainage panels during subsequent construction.
  1. For vertical applications, install protection course before installing drainage panels.

#### **3.07 INSULATION AND FILTER FABRIC INSTALLATION**

- A. Install one or more layers of board insulation to achieve required thickness over waterproofed surfaces. Cut and fit to within 1/4 inch (19 mm) of projections and penetrations.

- B. On vertical surfaces, set insulation units into rubberized asphalt according to manufacturer's written instructions.
- C. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger joints and tightly abut insulation units.
- D. Install filter fabric on top of board insulation. Apply fabric unbonded and shingle fashion over the installed insulation. Overlap all edges a minimum of 12". Slit fabric to fit over any roof penetrations. Cut around roof drains and other openings.

### **3.08 FIELD QUALITY CONTROL**

- A. Manufacturer Inspection:
  - 1. Provide a minimum of one (1) site visit by waterproofing manufacturer's technical field inspector at onset of installation, one (1) site visit during waterproofing installation, and one (1) site visit at completion of waterproofing installation.
  - 2. Submit written reports by manufacturer's field inspector to Architect for review.
- B. Electronic Leak Detection Testing:
  - 1. Contractor shall engage qualified Testing Firm to perform membrane integrity testing. Perform testing of all installation areas in accordance with ASTM D8231.
    - a. Perform testing by low or high voltage method at horizontal membranes with protection course installed, in accordance with recommended conditions and methods. High voltage testing shall be performed on vertical flashing surfaces.
    - b. Identify locations of membrane breaches; record locations and document with photographs. Submit test reports to Architect.
    - c. Confirm completed repair of identified breach locations and retest to verify water tightness and integrity of membrane.
  - 2. Electronic Leak Detection Test: Test upon completion of membrane, and test a second time, prior to installation of above-membrane components, if those components are not installed within two (2) weeks of membrane completion, or if construction traffic/storage has been permitted on the installed waterproofing surface.
  - 3. Drains: Perform flood testing at all drain locations in accordance with industry standards.

### **3.09 CLEANING AND PROTECTION**

- A. Protect waterproofing from damage and wear during remainder of construction period.
- B. Protect installed board insulation from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.
- C. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

### **END OF SECTION**

**SECTION 07 1900  
WATER REPELLENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Water repellents applied to exterior and interior cast stone and interior ground face masonry surfaces.

**1.02 RELATED REQUIREMENTS**

- A. Section 04 2000 – Unit Masonry.
- B. Section 04 7200 – Cast Stone Masonry.
- C. Section 07 9200 – Joint Sealants.

**1.03 REFERENCE STANDARDS**

- A. ASTM D3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings 2005 (Reapproved 2018).
- B. ASTM D5095 - Standard Test Method for Determination of the Nonvolatile Content in Silanes, Siloxanes and Silane-Siloxane Blends Used in Masonry Water Repellent Treatments 1991 (Reapproved 2022).

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene a meeting at least one week prior to starting work; require attendance of affected installers; invite Architect and Owner.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide product description, limitations, and chemical composition.
- C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention; cautionary procedures required during application.
- D. Manufacturer's Field Reports: Report whether manufacturer's "best practices" are being followed; if not, state corrective recommendations. Email report to Architect the same day as inspection occurs; mail report on manufacturer's letterhead to Architect within 2 days after inspection.
- E. Manufacturer's Qualification Statement.
- F. Installer's Qualification Statement.

**1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum five years experience.

**1.07 MOCK-UP**

- A. Locate where directed.
- B. Accepted mock-up may remain as part of the Work.

**1.08 FIELD CONDITIONS**

- A. Protect liquid materials from freezing.
- B. Do not apply water repellent when ambient temperature is lower than 50 degrees F or higher than 100 degrees F.

**1.09 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

- B. Correct defective Work within a one year period after Date of Substantial Completion.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Acrylic Water Repellents:
1. Diedrich Technologies: [www.diedrichtechnologies.com](http://www.diedrichtechnologies.com)
  2. PROSOCO, Inc: [www.prosoco.com](http://www.prosoco.com).
  3. Substitutions: See Section 01 6000 - Product Requirements.
- B. Silane, Siloxane, Silane-Siloxane Blend, and Siliconate Water Repellents:
1. Diedrich Technologies: [www.diedrichtechnologies.com](http://www.diedrichtechnologies.com)
  2. PROSOCO, Inc: [www.prosoco.com](http://www.prosoco.com).
  3. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 MATERIALS**

- A. Water Repellent: Non-glossy, colorless, penetrating, water-vapor-permeable, non-yellowing sealer, that dries invisibly leaving appearance of substrate unchanged.
1. Applications: Vertical surfaces and non-traffic horizontal surfaces.
  2. Number of Coats: 1 or 2 coats as recommended by the manufacturer.
  3. VOC Content: Less than 100 g/L, when tested in accordance with ASTM D3960 or ASTM D5095.
  4. Water-based siloxane, silane, or blend that reacts chemically with concrete and masonry.
    - a. Basis of Design: Sure Klean Weather Seal Siloxane PD.
    - b. Apply with low-pressure spray, brush or roller.
    - c. Typical Technical Data:
      - 1) Form: cloudy white liquid, odorless
      - 2) Specific Gravity: 0.996
      - 3) pH: 4 to 5
      - 4) Weight/Gallon: 8.29 pounds
      - 5) Active Content: 7 percent
      - 6) Total Solids: 4 percent ASTM D5095
      - 7) Flash Point: greater than 212 degrees F (greater than 100 degrees C) ASTM D 3278
      - 8) Freeze Point: 32 degrees F (0 degrees C)
      - 9) VOC Content: less than 30 grams per Liter, Low Solids Coating.
    - d. Locations: Apply at exterior and interior cast stone.
  5. Water-based acrylic that reacts chemically with concrete and masonry.
    - a. Basis of Design: Sure Klean Weather Seal Gloss 'N Guard WB.
    - b. Apply with low-pressure spray, brush or roller.
    - c. Technical Data:
      - 1) Form: White, opaque liquid, mild odor
      - 2) Specific Gravity: 1.02
      - 3) pH: 8.00
      - 4) Weight/Gallon: 8.50 pounds
      - 5) Active Content: 30 percent
      - 6) Total Solids: 30 percent ASTM D2369
      - 7) Flash Point: greater than 212 degrees Fahrenheit (greater than 100 degrees Celsius)
      - 8) Freeze Point: 32 degrees Fahrenheit (0 degrees Celsius)
      - 9) Shelf Life: 1 year in tightly sealed, unopened container
      - 10) VOC Content: less than 100 grams per Liter.
    - d. Locations: Apply at all interior ground face masonry.



## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify joint sealants are installed and cured.
- C. Verify surfaces to be coated are dry, clean, and free of efflorescence, oil, or other matter detrimental to application of water repellent.

### **3.02 PREPARATION**

- A. Protection of Adjacent Work:
  - 1. Protect adjacent landscaping, property, and vehicles from drips and overspray.
  - 2. Protect adjacent surfaces not intended to receive water repellent.
- B. Prepare surfaces to be coated as recommended by water repellent manufacturer for best results.
- C. Do not start work until masonry mortar substrate is cured a minimum of 60 days.
- D. Remove loose particles and foreign matter.
- E. Remove oil and foreign substances with a chemical solvent that will not affect water repellent.
- F. Scrub and rinse surfaces with water and let dry.
- G. Allow surfaces to dry completely to degree recommended by water repellent manufacturer before starting coating work.

### **3.03 APPLICATION**

- A. Apply water repellent in accordance with manufacturer's instructions, using procedures and application methods recommended as producing the best results.
- B. Apply at rate recommended by manufacturer, continuously over entire surface.
- C. Remove water repellent from unintended surfaces immediately by a method instructed by water repellent manufacturer.
- D. Provide manufacturer's field service representative to inspect preparation and application work to ensure that manufacturer's "best practices" for preparation and application are being followed.

**END OF SECTION**



**SECTION 07 2100  
THERMAL INSULATION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Board insulation at masonry cavity wall construction and exterior wall behind masonry veneer, MCM and metal panel wall finish.
- B. Batt insulation in exterior wall construction.
- C. Semi-Rigid Board/Blanket insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.
- D. Acoustical batt insulation for interior walls and above ceilings.
- E. Mineral wool insulation for fire safing.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 2200 - Roof and Deck Insulation: Insulation specified as part of roofing system.
- B. Section 07 8400 - Firestopping: Insulation as part of fire-rated through-penetration assemblies.
- C. Section 09 2982 – Gypsum Board.
- D. Section 09 5100 – Acoustical Ceilings.

**1.03 REFERENCE STANDARDS**

- A. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications 2013 (Reapproved 2019).
- B. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation 2014 (Reapproved 2019).
- C. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing 2023.
- D. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board 2023.
- E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023b.
- F. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 °C 2022.
- G. BIA - The Brick Industry Association; Tech Note on Brick Construction, 28B Revised II.
- H. ICC (IECC) - International Energy Conservation Code 2015.
- I. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components 2023.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements. Provide documentation that proposed insulation has been successfully tested per NFPA 285 with each specific exterior wall assembly for the project. Provide documentation of required detailing for proposed insulation board at openings in the exterior walls to comply with NFPA 285 requirements.
- D. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.
- E. Closeout Submittals:

1. Submit under provisions of Section 01 7800 – Closeout Submittals
2. Submit Material Safety Data Sheets under provisions of Section 01 7800 – Closeout Procedures for the following items:
  - a. All mastics, glues, and adhesives.
  - b. Thermal insulation (excluding fiberglass, foam, rubber).

#### **1.05 FIELD CONDITIONS**

- A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

### **PART 2 PRODUCTS**

#### **2.01 FOAM BOARD INSULATION MATERIALS**

- A. Polyisocyanurate (ISO) Board Insulation with Facers Both Sides, installed on masonry wall, behind MCM or metal wall panels where indicated: Rigid cellular foam, complying with ASTM C1289; Type I, aluminum foil both faces; Class 1 or 2.
  1. Classifications:
    - a. Type I: Faced with aluminum foil on both major surfaces of core foam.
      - 1) Class 1 or Class 2 - Glass fiber reinforced or non-reinforced core foam.
  2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
  3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
  4. Complies with fire resistance requirements indicated on drawings as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285.
  5. Compressive Strength: 25 psi at vertical locations.
  6. Board Size: 48 by 96 inch, cut to fit locations indicated. Thickness as noted on the drawings.
  7. Thermal Resistance: R-value of 6.0 per inch, minimum.
  8. Board Edges: As tested to be in compliance with NFPA 285.
  9. Manufacturers:
    - a. Atlas Roofing Corporation: [www.atlasroofing.com/sle](http://www.atlasroofing.com/sle).
    - b. Carlisle Coatings & Waterproofing, Inc: [www.carlisleccw.com/sle](http://www.carlisleccw.com/sle).
    - c. Dow Chemical Company: [www.dow.com/sle](http://www.dow.com/sle).
    - d. Firestone Building Products: [www.firestonebpco.com](http://www.firestonebpco.com).
    - e. GAF: [www.gaf.com/sle](http://www.gaf.com/sle).
    - f. Hunter Panels, LLC: [www.hunterxci.com](http://www.hunterxci.com).
    - g. Johns Manville: [www.jm.com/sle](http://www.jm.com/sle).
    - h. Ox Engineered Products: [www.oxengineeredproducts.com/#sle](http://www.oxengineeredproducts.com/#sle).
    - i. Rmax Inc: [www.rmax.com](http://www.rmax.com).
    - j. Substitutions: See Section 01 6000 - Product Requirements.

#### **2.02 FIBERBOARD INSULATION MATERIALS**

- A. Glass Fiber Semi-Rigid Board/Blanket Insulation: Low density board, in accordance with ASTM C553, Type III.
  1. Provide in shim spaces, crevices in exterior wall/roof and expansion joints as detailed on the drawings.
  2. Facing: None, unfaced.
  3. Flame Spread Index: 25 or less, when tested with facing, if any, in accordance with ASTM E84.
  4. Smoke Developed Index: 50 or less, when tested with facing, if any, in accordance with ASTM E84.
  5. Board Size: 24 by 48 inch.
  6. Board Thickness: 1 inch.
  7. Board Edges: Square.
  8. Maximum Density: 1.6 pounds per cubic foot, nominal.
  9. Manufacturers:

- a. CertainTeed Corporation: [www.certainteed.com](http://www.certainteed.com).
- b. Johns Manville: [www.jm.com](http://www.jm.com).
- c. Knauf Insulation: [www.knaufnorthamerica.com](http://www.knaufnorthamerica.com)
- d. Owens Corning Corporation: [www.ocbuildingspec.com](http://www.ocbuildingspec.com).
- e. Substitutions: See Section 01 6000 - Product Requirements.

### **2.03 BATT INSULATION MATERIALS**

- A. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
  - 1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
  - 2. Smoke Developed Index: 50 or less, when tested in accordance with ASTM E84.
  - 3. Combustibility: Non-combustible, when tested in accordance with ASTM E136.
  - 4. Formaldehyde Content: Zero.
  - 5. Thermal Resistance: R-value of 11 at 3.5" and 19 at 6".
  - 6. Facing: Unfaced.
  - 7. Manufacturers:
    - a. CertainTeed Corporation: [www.certainteed.com](http://www.certainteed.com).
    - b. Johns Manville: [www.jm.com](http://www.jm.com).
    - c. Knauf Insulation: [www.knaufnorthamerica.com](http://www.knaufnorthamerica.com)
    - d. Owens Corning Corporation: [www.ocbuildingspec.com/sle](http://www.ocbuildingspec.com/sle).
    - e. Substitutions: See Section 01 6000 - Product Requirements.
- B. Acoustical Batt Insulation:
  - 1. Provide sound attenuation batts within interior walls and above ceilings, where indicated.
  - 2. Glass fiber composition, unfaced.
    - a. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
    - b. Smoke Developed Index: 50 or less, when tested in accordance with ASTM E84.
    - c. Thickness: 3.5 or 6 inch, nominal for given location.
    - d. Facing: Unfaced.
  - 3. Manufacturers:
    - a. CertainTeed Corporation: [www.certainteed.com](http://www.certainteed.com).
    - b. Johns Manville: [www.jm.com](http://www.jm.com).
    - c. Knauf Insulation: [www.knaufnorthamerica.com](http://www.knaufnorthamerica.com).
    - d. Owens Corning Corporation: [www.ocbuildingspec.com](http://www.ocbuildingspec.com).
    - e. Substitutions: See Section 01 6000 - Product Requirements.

### **2.04 FIRE SAFING INSULATION**

- A. Mineral Fiber Batt Insulation (Mineral Wool): Flexible or semi-rigid preformed batt or blanket, complying with ASTM C665; friction fit; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.
  - 1. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.
  - 2. Where indicated or required, provide as fire safing of through penetrations, joint systems and perimeter containment in rated assemblies.
  - 3. Size and Density: As required to prevent passage of fire between floors or through walls for rating stated.
  - 4. Manufacturers:
    - a. Johns Manville: [www.jm.com/#sle](http://www.jm.com/#sle).
    - b. ROCKWOOL (ROXUL, Inc): [www.rockwool.com/#sle](http://www.rockwool.com/#sle).
    - c. Thermafiber, Inc: [www.thermafiber.com/#sle](http://www.thermafiber.com/#sle).
    - d. Substitutions: See Section 01 6000 - Product Requirements.

### **2.05 ACCESSORIES**

- A. Air Barrier Sheet or Air Barrier Coating: See Section 07 2500.

- B. Nails or Staples: Steel wire; electroplated or galvanized; type and size to suit application, prohibited for use with foam or high density rigid mineral fiber insulation boards.
- C. Insulation Pins: Insulation manufacturer's standard stainless steel pins with perforated plates, intended for installation in adhesive.
- D. Adhesive: Type recommended by insulation manufacturer for application.
  - 1. Adhesives used to attach exterior insulation to air barrier shall be approved by air barrier manufacturer.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
- B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

#### **3.02 BOARD INSTALLATION AT EXTERIOR WALLS**

- A. Install Iboard insulation on masonry walls, behind MCM or Metal Wall Panels in accordance with fire resistance requirements shown on the drawings and as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285.
  - 1. Protect edges at door and window openings or other penetrations as tested in accordance with NFPA 285.
  - 2. Blind fastening of insulation through the air/weather barrier is prohibited. Securement of installation boards shall be provided with adhesives or furring installed at the air/weather barrier surface prior to installation of boards.
- B. Install boards vertically on walls.
  - 1. Place boards to maximize adhesive contact.
  - 2. Butt edges and ends tightly to adjacent boards and protrusions. Stagger board joints.
- C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

#### **3.03 BOARD INSTALLATION AT CAVITY WALLS**

- A. Install boards to fit snugly between wall ties.
- B. Install boards vertically on walls.
  - 1. Place boards to maximize adhesive contact.
  - 2. Butt edges and ends tightly to adjacent boards and protrusions. Stagger board joints.
- C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

#### **3.04 BATT INSTALLATION**

- A. Install insulation in accordance with manufacturer's instructions.
- B. Install in exterior wall spaces without gaps or voids. Do not compress insulation.
- C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
- E. Wall Sound Insulation: Install Insulation in all metal stud walls unless noted otherwise. Do not install insulation between studs where plumbing lines occur.
- F. Ceiling Sound Insulation: Install above the entirety of all offices, restrooms, and workrooms and any other areas defined on the drawings and at the perimeter of all teaching spaces. Place sound isolation batts 2'-0" minimum each side parallel to the designated wall and across the top of the wall at ceiling and wall intersection of walls designated to have sound isolation batts.
- G. Coordinate work of this section with construction of air barrier seal specified in Section 07 2500.

**3.05 PROTECTION**

- A. Do not permit installed insulation to be damaged prior to its concealment.

**END OF SECTION**





**SECTION 07 2129  
SPRAYED INSULATION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Cellulose insulation applied to underside of structure.

**1.02 REFERENCE STANDARDS**

- A. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus 2019, with Editorial Revision (2023).
- B. ASTM C739 - Standard Specification for Cellulosic Fiber Loose-Fill Thermal Insulation 2021a.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023b.
- D. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 °C 2022.

**1.03 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on materials, describing insulation properties and sealer.
- C. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

**1.04 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum five years of documented experience.
- C. Products Specified by Flammability or Combustibility Criteria: Listed and classified by Underwriters Laboratories Inc.

**1.05 MOCK-UP**

- A. Provide 1 mock-up, 8 feet long by 8 feet wide, illustrating wall construction, ceiling construction, window and frame, and door frame.
- B. Locate where directed.
- C. Approved mock-up may remain as part of the Work.

**1.06 FIELD CONDITIONS**

- A. Do not install insulation, sealer when ambient and surface temperatures are lower than 40 degrees F.
- B. Maintain acceptable ambient and substrate surface temperatures prior to, during, and after installation of primer and insulation materials and overcoat.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Cellulosic Fiber Sprayed Insulation:
  - 1. International Cellulose Corp: [www.spray-on.com](http://www.spray-on.com).
  - 2. ThermoCon, Inc: [www.thermocon.com](http://www.thermocon.com).
  - 3. Substitutions: See Section 01 6000 - Product Requirements.

## **2.02 MATERIALS**

- A. Cellulose Fiber Insulation: ASTM C739; treated cellulose fiber, color shall be from manufacturer's standard color chart conforming to the following test requirements:
  - 1. Thermal Resistance (R-value): 3.75, at 1 inch thick when tested in accordance with ASTM C177 at 75 degrees F temperature
  - 2. Density: 2 lb/cu ft, when tested in accordance with ASTM D1622/D1622M.
  - 3. Moisture Absorption: Maximum 15 percent by weight.
  - 4. Flame Spread and Smoke Developed Index: 10/0, when tested in accordance with ASTM E84.
  - 5. Combustibility: Passing ASTM E136.
  - 6. Basis of Design: K-13 Spray-On-Systems.

## **2.03 ACCESSORIES**

- A. Primer: As required by insulation manufacturer.
- B. Insulation Stop: Plastic, profiled and sized to suit joist spacing and wall/sloped roof configuration.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that surfaces are clean, dry, and free of matter that may inhibit adhesion.
- B. Verify that ceiling hangers and supporting clips have been installed correctly.
- C. Verify other work on and within spaces to be insulated is complete prior to application.

### **3.02 PREPARATION**

- A. Mask and protect adjacent surfaces from overspray or damage.
- B. Apply primer in accordance with manufacturer's instructions.
- C. Install insulation stops between joist at wall/sloped roof construction to prevent insulation from covering soffit vents or from limiting air circulation from soffit to attic space.

### **3.03 INSTALLATION**

- A. Install insulation in accordance with manufacturer's instructions.
- B. Install sprayed insulation to a uniform monolithic density without voids.
- C. Install to achieve a thermal resistance R-value of 10 minimum.
- D. Tamp wet sprayed insulation surface to improve adhesion and to achieve a smooth surface.

### **3.04 FIELD QUALITY CONTROL**

- A. Independent agency field inspection, If required, will be provided under provisions of Section 01 4000.
- B. Inspection will include verification of insulation and sealer thickness and density.

### **3.05 PROTECTION**

- A. Do not permit subsequent construction work to disturb applied sprayed insulation.

**END OF SECTION**

**SECTION 07 2200  
ROOF AND DECK INSULATION**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Roof and Deck Insulation.

**1.02 RELATED WORK**

- A. Section 06 1000 – Rough Carpentry
- B. Section 07 6200 – Sheet Metal Flashing and Trim

**1.03 SYSTEM DESCRIPTION**

- A. Install rigid board insulation and coverboard as required to achieve a complete and proper substrate for the roof membrane system and associated crickets, saddles, and taper to provide complete drainage of stormwater. Refer to Part 2 and Drawings for insulation thicknesses required.

**1.04 SUBMITTALS**

- A. Submit manufacturer's installation instructions, samples and product data, in accordance with the provisions of Division 1.
- B. Submit fastening and adhesive patterns for field, perimeter, and corner areas to sufficiently comply with wind loads calculated in accordance with ASCE 7, as referenced by applicable Codes.
- C. Submit roof plan indicating proposed dimensions of perimeter and corner zones, complying with minimum requirements specified in the Drawings.
- D. Submit tapered insulation layout plans.
- E. Submit manufacturer's certificate, in accordance with the provisions of Section 013300, that products meet or exceed specified requirements.
- F. Submit certification from roof membrane manufacturer that board insulation materials are acceptable for use with roof membrane materials.
- G. Submit Results of Third Party Vapor Barrier Bond Strength Testing.
  - 1. Prior to installation of insulation, provide load testing to confirm in-place vapor retarder bond strength at a minimum of two (2) locations, 12"x12" minimum test sample size.
  - 2. Adhere 12"x12" piece of structural plywood to the test sample in a full bed of low rise adhesive, cut vapor barrier around plywood.
  - 3. Attach a load cell to the plywood in a manner to ensure failure does not occur at this location. Test to failure, document results in a report submitted to A/E.
  - 4. Minimum acceptable bond strength: 600 pounds per square foot.

**1.05 REGULATORY REQUIREMENTS**

- A. Conform to applicable local building codes for roof assembly requirements.

**1.06 QUALITY ASSURANCE**

- A. Comply with PIMA and NRCA standards and requirements.
- B. Materials shall comply with the requirements to meet UL Class A Ratings (UL 790 and UL 1256 Standard) and FM Global Class 1 (FM 4450 and FM 4470) requirements.
- C. Contractor shall provide in-place mock-ups to illustrate insulation offsets and staggers in accordance with the requirements in this Section.
- D. Work shall not commence prior to the Pre-Roofing Conference.

**1.07 DELIVERY, STORAGE AND HANDLING**

- A. Deliver and store products in accordance with the provisions of Division 1.

- B. Any material becoming wet or damaged, including water stained facers will be rejected and shall be removed from the jobsite immediately and replaced at Contractor's expense. Any insulation found to be improperly stored at the jobsite shall be considered wet at the discretion of the Architect and removed from the jobsite.
- C. Materials Stored on Roof Levels for Immediate Use Only:
  - 1. Comply with maximum roof live loads specified by the Structural Engineer.
  - 2. Distribute to prevent concentrated loads that would impose excessive strain on deck or structural members.
  - 3. Positively secure to prevent displacement by wind.
  - 4. Tarp for protection from exposure as noted above.
  - 5. Material storage on roof levels overnight is not allowed.

#### **1.08 SEQUENCING AND SCHEDULING**

- A. Coordinate work under provisions of Division 1.
- B. Coordinate the work of installing roof membrane and flashing as the work of this Section proceeds.
- C. Plan roof layout with respect to roof deck slope to prevent rainwater drainage into completed roofing. All roof drains and/or scuppers shall be installed prior to beginning with installation. Contractor shall coordinate location and heights of drains/scuppers to ensure ponding does not occur after roof installation. Improper coordination for drainage components resulting in ponding or shaved rigid insulation will require correction at the Contractor's expense.
- D. Do not install more insulation than can be covered with the complete roof system in the same day.
- E. Do not install roofing until all wood blocking, roof curbs, and penetrations have been installed.
- F. Do not install materials in fog and/or inclement weather or when rain is predicted (30% or more possibility) or when ambient temperature is below 40 F. The Contractor shall suspend work if in their opinion, wind speed will impede the proper installation of the roofing work or cause a danger to personnel or the property.

### **PART 2 - PRODUCTS**

#### **2.01 INSULATION MATERIALS**

- A. Flat Stock Polyisocyanurate Insulation, ASTM C1289, Type II, Class 2, Grade 2 (20 psi) closed cell foam core bonded to coated fiberglass facers, 4'x4' maximum board dimension,
  - 1. Maximum board thickness: 2.6".
  - 2. System Thickness (metal and membrane roofs over conditioned space): Two (2) layers 2.5" or 2.6" thickness insulation, total thickness 5" minimum.
- B. Tapered Polyisocyanurate Insulation, ASTM C1289, Type II, Class 2, Grade 2 (20 psi) closed cell foam core bonded to coated fiberglass facers, slope as indicated in the Drawings,
  - 1. Maximum board thickness: 2.6", except in locations where at least 3 layers of insulation are present.
  - 2. System thickness (membrane roofs over conditioned space): Total average thickness 5" minimum, with average calculated based on a maximum variation of 1 inch.
- C. Tapered Edge Strips expanded perlite, ASTM C 728, Type 1.
- D. Cover Board: unfaced or premium roof grade faced gypsum coverboard, USG Securock (ASTM C 1278), Densdeck Prime (ASTM C 1177), or approved equivalent, 1/2" thickness.

#### **2.02 ACCESSORIES**

- A. General: Provide fasteners approved by insulation manufacturer, meeting wind uplift requirements as specified.
- B. Metal Decks: No. 12 hex-head fastener with coating which exceeds F.M. Specification No. 4470

1. Induction welding type metal plates, approved by roof membrane manufacturer.
- C. Insulation Adhesive: manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:
  1. Modified asphaltic, asbestos-free, cold-applied adhesive.
  2. Bead-applied, low-rise, one-component or multicomponent urethane adhesive.
  3. Full-spread spray-applied, low-rise, two-component urethane adhesive. .

### **PART 3 - EXECUTION**

#### **3.01 PREPARATION**

- A. Prepare existing substrate to receive new roofing in accordance with Section 07 01 50.
- B. Clean deck and ensure deck is dry prior to the application of new roof assembly.
- C. Wet, water stained, warped, discolored, or physically damaged insulation and/or insulation facers will be rejected and must be removed from the project site.

#### **3.02 INSULATION INSTALLATION**

- A. Only install materials that can be temporarily sealed at the end of the workday. All open roof areas are to be temporarily sealed at the end of each workday or when inclement weather is expected. Any installed roof materials that become wet must be removed and replaced prior to continuing roofing
- B. Verify and document in Daily Report that the existing deck/substrate is functional; insulation board is free from moisture and suitable as substrate for roof membrane.
- C. Attachment Schedule: Comply with approved fastening patterns and zone widths.
  1. Concrete Decks with Membrane Roofing:
    - a. Install self-adhered or heat-welded vapor barrier as specified above.
    - b. Adhere each layer of insulation and coverboard to clean substrate in ribbons of low rise adhesive in accordance with approved ribbon spacing patterns for field, perimeter, and corner areas and as specified below.
  2. Wood or Metal Decks with Membrane Roofing:
    - a. Mechanically fasten first layer of insulation to achieve uplift pressures indicated in Drawings in field, perimeter, and corners, and per approved fastening patterns based on pull out testing performed in accordance with Section 07 01 50. Ensure proper fastener engagement in substrate to provide full pullout resistance.
    - b. Install subsequent layers of insulation and coverboard in adhesive in accordance with approved ribbon spacing patterns for field, perimeter, and corner areas and as specified below.
  3. Cementitious Wood Fiber and Lightweight Fill Decks with Membrane Roofing:
    - a. Install base sheet mechanically fastened to lightweight fill after performing repairs per Section 070150.
    - b. Adhere first layer of insulation board and subsequent layers in in ribbons of low rise adhesive.
  4. Wood or Metal Decks with Metal Roofing:
    - a. Mechanically fasten all layers of insulation to substrate, with boards laid in staggered pattern.
    - b. Provide a minimum 8 fasteners per 4'x8' board, with additional fasteners as required to ensure a smooth substrate for installation of underlayment materials and panel clips.
- D. Mechanical Fastener Installation, General:
  1. Mechanically fasten first layer boards with approved fasteners and plates.
  2. Ensure that fasteners penetrate top flange of deck  $\frac{3}{4}$ -inch, do not penetrate bottom flange of deck. Reinstall fasteners that do not engage top flute of deck.
  3. Provide fasteners in location per the approved fastening pattern and layout provided by the manufacturer. Provide required edge distance between fasteners and edge of boards.

E. Adhesive Application, General:

1. Install insulation and coverboard layers in low-rise foam adhesive in accordance with approved ribbon spacing patterns and shop drawings for field, perimeter, and corner areas. Ensure adhesive ribbons extend to within 2" of board edges. Provide an additional ribbon of adhesive around the perimeter of each board.
2. Do not allow the adhesive application to precede the board placement by more than three board lengths.
3. Allow low-rise foam adhesive to rise between  $\frac{3}{4}$ " to 1" prior to placement of boards, or as required by the manufacturer.
4. Firmly press each insulation board into adhesive by "walking-in" each board immediately after placement. Provide a minimum of five (5) weighted five (5) gallon buckets per board at corners and center of each board. Boards not properly adhered will require to be removed and replaced.
5. Stagger end joints in adjacent boards. Stagger successive layers in both vertical and horizontal directions. Minimum horizontal stagger is 2-feet; minimum vertical stagger is 12-inches.
6. Butt edges for snug contact. Repair voids greater than  $\frac{1}{4}$ " wide by filling with like material.
7. Tapered Insulation Sumps and Crickets:
  - a. Curbs: Install upslope crickets at all curbs wider than 12 inches.
  - b. Drains: Install a minimum 4'-0" by 4'-0" tapered insulation sump at all primary roof drains. Install a minimum 4'-0" by 2'-0" tapered insulation sump at all primary scuppers.
  - c. Gutters: Install a minimum 1'-0" wide tapered edge to increase slope at membrane roof gutter edges.

- F. Failure to install the roof insulation fasteners and/or low-rise foam adhesive as described in these specifications and the approved manufacturer's assembly letter will be considered defective workmanship and application of the roof system by the Contractor. Contractor shall remove and replace all roof system materials with non-compliant attachment at no cost to the Owner.

**END OF SECTION**

**SECTION 07 2500  
WEATHER BARRIERS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Air Barriers: Materials that form a system to stop passage of air through exterior walls, joints between exterior walls and roof, joints around frames of openings in exterior walls, and joints at base of wall.
- B. Membrane Through Wall Flashings: Self-adhered membrane flashings that comprise part of the air barrier system, intended by the air barrier manufacturer for use in masonry veneer wall construction.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 1119 - Insulating Concrete Forming
- B. Section 04 2000 - Unit Masonry: Coordination of through wall flashing and masonry ties.
- C. Section 07 6200 - Sheet Metal Flashing and Trim: Metal flashings installed in conjunction with weather barriers.
- D. Section 07 9200 - Joint Sealants: Sealing building expansion joints.

**1.03 DEFINITIONS**

- A. Weather Barrier: Assemblies that form either water-resistive barriers, air barriers, or vapor retarders.
- B. Air Barrier: Air tight barrier made of material that is relatively air impermeable but water vapor permeable, both to the degree specified, with sealed seams and with sealed joints to adjacent surfaces. Note: For the purposes of this specification, vapor impermeable air barriers are classified as vapor retarders.

**1.04 REFERENCE STANDARDS**

- A. ASTM C297/C297M - Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions 2016.
- B. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection 2021.
- C. ASTM D4541 - Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers 2022.
- D. ASTM E2357 - Standard Test Method for Determining Air Leakage of Air Barrier Assemblies 2017.
- E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023b.
- F. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials 2022a, with Editorial Revision (2023).
- G. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials 2021a.
- H. ICC-ES AC212 - Acceptance Criteria for Water-Resistive Coatings Used as Water-Resistive Barriers over Exterior Sheathing 2015, with Editorial Revision (2020).
- I. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components 2023.

### **1.05 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-Installation Conference: A pre-installation conference shall be held prior to commencement of field operations to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work. Preinstallation conference shall include the Architect, General Contractor, Manufacturer's Representative and Applicator. Agenda for meeting shall include but not be limited to the following:
  - 1. Review of submittals.
  - 2. Review of surface preparation, minimum curing period and installation procedures.
  - 3. Review of special details and flashings.
  - 4. Sequence of construction, responsibilities and schedule for subsequent operations.
  - 5. Review of mock-up requirements.
  - 6. Review of inspection, testing, protection and repair procedures.
- B. Coordination of trades
  - 1. The Architect, General Contractor and Applicator shall evaluate adjacent materials such as windows, doors, etc. for conformance to project details. Adjacent trades shall provide scaled shop drawings for review by the Architect.
  - 2. The General Contractor shall make provision for installation of air seals between the primary air barrier and other wall components (penetrations, etc.) in order to maintain continuity of an air barrier system.
  - 3. The Applicator shall provide protection of rough openings before installing windows, doors, and other penetrations through the wall.

### **1.06 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on material characteristics, performance criteria, and limitations.
- C. Shop Drawings: Provide drawings of special joint conditions.
- D. Manufacturer's Installation Instructions: Indicate preparation, installation methods, and storage and handling criteria.
- E. Air/water-resistive barrier membrane manufacturer shall provide an ICC-ES Evaluation Report confirming compliance with AC212 Acceptance Criteria for Water-Resistive Coatings used as Water-Resistive Barriers over Exterior Sheathing or Masonry or ICF.
- F. ABAA Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.
- G. ABAA Installer Qualification: Submit documentation of current contractor accreditation and current installer certification; keep copies of each contractor accreditation and installer certification on site during and after installation, and present on-site documentation upon request.

### **1.07 QUALITY ASSURANCE**

- A. Air Barrier Association of America (ABAA) Evaluated Materials Program; [www.airbarrier.org/#sle](http://www.airbarrier.org/#sle): Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture, and use secondary materials approved in writing by primary material manufacturer.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience and approved by manufacturer. Air barrier Subcontractor(s) shall be accredited minimum of three years at the time of bidding and during the complete installation period by the Air Barrier Association of America (ABAA).
- C. Components used in this section shall be sourced from one manufacturer, including membrane, air barrier sealants, primers, mastics, self-adhered flashings and adhesives as listed and approved as an evaluated air barrier assembly by the Air Barrier Association of America.



## **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials to the job site in undamaged and original packaging indicating the name of the manufacturer and product.
- B. All pail goods shall bear the ABAA Evaluated Air Barrier label
- C. Store roll materials on end in original packaging.
- D. Keep all products stored at above 40°F. Apply to a substrate with a surface T°F of 40°F and rising. DO NOT ALLOW PRODUCT TO FREEZE.
- E. Protect rolls from direct sunlight until ready for use.
- F. Do not double stack pail goods.

## **1.09 MOCK-UP**

- A. Mockups: Before beginning installation of air/water-resistive barrier, provide air/water-resistive barrier work for exterior wall assembly mockups, incorporating backup wall construction, external cladding, window, door frame and sill, insulation, roof tie-in and flashing to demonstrate surface preparation, crack and joint treatment, and sealing of gaps, terminations, and penetrations of air barrier membrane.
  - 1. Coordinate construction of mockup to permit inspection by Owner's testing agency of air/water-resistive barrier before external insulation and cladding is installed.
  - 2. If Architect determines mockups do not comply with project requirements, reconstruct mockups and apply air/water-resistive barrier until mockups are approved.
  - 3. Contractor shall provide an in-place mockup of each type of expansion joint transitions between air barrier and roofing systems, and at angle changes, prior to proceeding with this work. Failure to provide mockup for review and approval will result in required removal of cladding as required to allow observation by A/E.
- B. Install air barrier materials in mock-up specified in Section 04 2000.
- C. Provide air/water leakage testing for air barrier materials and flashings located at mockup window systems per Division 8 Sections.

## **1.10 FIELD CONDITIONS**

- A. Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.

## **1.11 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide manufacturers 10 year material warranty.
  - 1. Ensure all manufacturers installation guidelines, specifications, details and warranty requirements are met.
  - 2. Warranty period shall be 10 years from date of substantial completion.

## **PART 2 PRODUCTS**

### **2.01 WEATHER BARRIER ASSEMBLIES**

- A. General: Air/water-resistive barrier shall be capable of performing as a continuous vapor-permeable air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. At wall cladding transitions, the air/water-resistive barrier shall form a continuous air barrier and shall make provision for water drainage, either by creation of an unobstructed drainage plane that extends across the cladding transition or by flashing to discharge to the exterior at the transition. Air barrier assemblies shall be capable of accommodating substrate movement and sealing substrate expansion and control joints, construction material changes, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits, or interruption of the drainage plane.
- B. Air Barrier shall be compatible with glass-mat faced gypsum, masonry and expanded polystyrene (ICF) wall systems.

- C. The weather barrier assembly, including but not limited to, fluid applied air/water-resistive barrier membrane, sheathing fabric, transition membrane and flashing primer shall be obtained or approved as a single-source from the membrane manufacturer to ensure system compatibility and integrity.
- D. Air Barrier:
  - 1. On outside surface of inside wythe of exterior masonry cavity walls use air barrier coating on wall surface and related thru-wall flashings, flashings for rough openings, windows, doors, base flashings and terminations to the roof.
  - 2. On outside surface of sheathing of exterior walls use air barrier coating on wall surface and related thru-wall flashings, flashings for rough openings, windows, doors, base flashings and terminations to the roof.
  - 3. On outside surface of ICF wall systems use air barrier coating on wall surface and related thru-wall flashings, flashings for rough openings, windows, doors, base flashings and terminations to the roof

## **2.02 AIR BARRIER MATERIALS (WATER VAPOR PERMEABLE AND WATER-RESISTIVE)**

- A. Air Barrier, Fluid Applied: Vapor permeable, elastomeric waterproofing.
  - 1. Air Barrier Coating:
    - a. Assembly Performance: Provide a continuous air barrier in the form of an assembly tested in accordance with ASTM E2357
    - b. Dry Film Thickness (DFT): Shall be minimum thickness as specified in the manufacturer written instructions for the substrate being applied and to produce a smooth pinhole-free surface and as required to achieve warranty.
    - c. Air Permeance: 0.004 cubic feet per minute per square foot, maximum, when tested in accordance with ASTM E2178.
    - d. Water Vapor Permeance: 10 perms, minimum, when tested in accordance with ASTM E96/E96M, Procedure B.
    - e. Ultraviolet (UV) and Weathering Resistance: Approved in writing by manufacturer for up to six months of weather exposure after application.
    - f. Tensile bond: Minimum 15 psi or exceeds strength of substrate when tested in accordance with ASTM C297/C297M.
    - g. Pull Adhesion: Minimum 110kPa (16psi) or substrate failure in accordance with ASTM D4541 for the substrate being applied.
    - h. Multi-Story Wall Assembly Burn Test: For multi-story buildings where required by code, Air Barrier, as a component of a wall assembly, shall have passed a NFPA 285 complete wall fire test.
    - i. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
    - j. Nail Sealability: Pass, when tested in accordance with ASTM D1970/D1970M.
    - k. VOC Content: 50 g per L or less.
    - l. Code Acceptance: Comply with applicable requirements of ICC-ES AC212.
    - m. Sealants, Tapes and Accessories: As recommended by coating manufacturer.
    - n. Manufactures and Products:
      - 1) Acrylic, Water-Based:
        - (a) Barritech VP by Carlisle Coatings and Waterproofing, Inc: [www.carlisleccw.com](http://www.carlisleccw.com)
        - (b) Air-Bloc 33MR, 17MR by Henry Company: [www.henry.com](http://www.henry.com)
        - (c) R-Guard by PROSOCO, Inc: [www.prosoco.com](http://www.prosoco.com)
        - (d) Wall Guardian by STS Coatings, Inc.: [www.stscoatings.com](http://www.stscoatings.com)
        - (e) ExoAir 230 by Tremco Commercial Sealants & Waterproofing: [www.tremcosealants.com](http://www.tremcosealants.com)
      - 2) STPE Based:
        - (a) Air-Bloc All Weather STPE, 33MR, 17MR by Henry Company: [www.henry.com](http://www.henry.com)

- (b) Cat 5 by PROSOCO, Inc: [www.prosoco.com](http://www.prosoco.com)
- (c) DensDefy by Georgia-Pacific: [www.buildgp.com](http://www.buildgp.com)
- 3) Substitutions: See Section 01 6000 - Product Requirements.

## **2.03 ACCESSORIES**

- A. Sealants, Flashings, and Accessories for Sealing Weather Barrier and Sealing Weather Barrier to Adjacent Substrates: As specified or as recommended by weather barrier manufacturer.
- B. Self-adhered Membrane Through Wall Flashing:
  - 1. Provide air barrier manufacturer's flexible, self-sealing through-wall flashing with silicone release sheet and associated accessories for:
    - a. Flashing at spandrels and cavities; under copings, band courses, and sill
    - b. Over lintels and shelf angles
    - c. At low roof to high wall conditions and all other wall conditions necessary to provide a watertight wall assembly.
  - 2. Manufacturers: Flashings shall be provided by the air barrier manufacturer, or explicitly approved in writing by the air barrier manufacturer for use as part of their warranted air barrier system.
  - 3. Accessories:
    - a. Provide manufacturer's surface conditioner and primer.
    - b. Termination Mastic:
      - 1) Description: Manufacturer's approved mastic with 200 g/l max. VOC Content.
    - c. Provide stainless steel type 304 termination bar equal to Hohmann & Barnard model T2-FTS with pre-punched holes at 8-inches on center max.
    - d. Provide three dimensional preformed external corners and end dams.
    - e. Refer to Section 07 6200 for metal through wall flashing drip edges and flashings.
- C. Liquid Flashing: One part, fast curing, non-sag, elastomeric, gun grade, trowelable liquid flashing.
- D. Transition Membrane, Seam and Window Flashing and High Temperature Rated Membrane: Peel and stick flashing membrane film bonded to sealant.
  - 1. Thickness: 25 mil, 0.025 inch minimum.
  - 2. Roll Width: 4, 6, 8 inch, as required for application.
  - 3. Coordinate installation with the Masonry Contractor and other provisions as required in Section 04 2000 - Unit Masonry.
- E. Thinners and Cleaners: As recommended by material manufacturer.
- F. Backer Rod: ASTM C 1330, Type B (bicellular material with a surface skin).

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that surfaces and conditions are ready to accept the work of this section.
- B. Walls
  - 1. Substrates
    - a. Wall sheathing must be securely fastened per applicable building code and sheathing manufacturer's requirements.
    - b. Examine surfaces to receive air/water resistive barrier and verify that substrate and adjacent materials are dry, clean, sound, and free of releasing agents, paint, or other residue or coatings. Verify substrate is flat, free of fins or planar irregularities greater than 1/4" in 10'. Verify that no excess mortar exists on masonry ties, shelf angles and other obstructions.
    - c. Verify that concrete is visibly dry and free of moisture.
    - d. Verify that masonry joints are struck flush and completely filled with mortar.
  - 2. Flashings

- a. All flashings must be installed in accordance with specific design and building code requirements. Where appropriate, end-dams must be provided.
  - b. Openings must be flashed prior to window/door, HVAC, etc. installation. Windows and openings shall be flashed according to design and building code requirements.
  - c. Individual windows that are ganged to make multiple units require continuous head flashing and the joints between the units must be fully sealed.
- 3. Kick-out flashing
  - a. Kick-out flashing must be installed leak-proof and angled (min 100°) to allow for proper drainage and water diversion.
- 4. Air Seals
  - a. Install between the primary air/weather barrier and other wall components (penetrations, etc.) in order to maintain continuity of the air barrier system
- C. Report all unsatisfactory conditions to the General Contractor. Application of fluid-applied air/water-resistive barrier shall not proceed until all unsatisfactory conditions have been corrected.

### 3.02 PREPARATION

- A. General: No additives are permitted unless specified in product mixing instructions. Close containers when not in use. Prepare in a container that is clean and free of foreign substances. Do not use a container which has contained or been cleaned with a petroleum-based product. Clean tools and equipment with water immediately after use. Dried material can only be removed mechanically.
- B. Sheathing joints or joints in ICF less than 1/2" shall be treated with liquid flashing as recommended by the manufacturer.
- C. Sheathing joints or joints in ICF over 1/2" shall be treated with transition material or as recommended by the manufacturer.
- D. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.
- E. Clean and prime substrate surfaces to receive adhesives and sealants in accordance with manufacturer's instructions.

### 3.03 INSTALLATION

- A. Install materials in accordance with manufacturer's instructions.
- B. Air Barriers: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.
  - 1. Apply additional membrane and/or sealant at all masonry wall ties and zee subframing fastened through air barrier for claddings.
- C. Apply sealants and adhesives within recommended application temperature ranges. Consult manufacturer if temperature is out of this range.
- D. Coatings:
  - 1. Prepare substrate in manner recommended by coating manufacturer; treat joints in substrate and between dissimilar materials as recommended by manufacturer.
  - 2. Where exterior masonry veneer is to be installed, install masonry anchors before installing weather barrier over masonry; seal around anchors air tight.
  - 3. Use flashing to seal to adjacent construction and to bridge joints.
- E. Membrane Through Wall Flashings at Masonry:
  - 1. General:
    - a. Whether or not specifically indicated, install membrane flashings to divert water to exterior at all locations where downward flow of water will be interrupted.
    - b. Install metal through wall flashing in accordance with Section 07 6200. Metal flashing shall be continuous including at elevation changes (i.e. steps).
  - 2. Mockup:

- a. Contractor shall provide an in-place mockup for review by Architect and Consultant of complete through wall flashing system, including stainless steel drip edges, incorporating end dams at a typical termination of flashing.
  - b. Failure to provide mockup or review of through wall flashing materials prior to installation of insulation and masonry may result in removal and reinstallation of materials at Contractor's expense, as required to observe installed conditions at flashings.
  - c. Through wall flashings that are improperly installed or installed in the wrong position, regardless of whether cladding has been installed or not, shall be removed by the Contractor and new flashings installed to the proper condition at no cost to the Owner.
3. Preparation:
  - a. Install flashing to dry surfaces when air and surface temperatures are 40°F and above.
  - b. All flashings shall be installed to produce a fully watertight assembly.
  - c. Prepare the masonry surfaces so that they are smooth and free of obstructions where installing flashings. Apply the surface conditioner per the manufacturers written recommendations for proper adhesion of the flashings.
  - d. Precut pieces of flashing to easily handled lengths for each location.
4. Installation:
  - a. Remove release paper and position flashing carefully before placing it against the surface.
  - b. When properly positioned, place against surface by pressing firmly into place by hand roller. Fully adhere flashing to substrate to prevent water from migrating under flashing.
  - c. Overlap adjacent pieces 6" and roll all seams with a steel hand roller.
  - d. Install prefabricated external and internal corners and end dams.
  - e. Extend the flashing from 1/2" inside the face of the exterior wall, through the exterior masonry wythe, and up the cavity space a minimum of 6" above the top of the cavity drainage system. Install termination bar at top of flashing and seal with mastic. Strip in air barrier over through wall flashing.
  - f. Apply a bead or trowel coat of mastic along flashing top edge, seams, cuts, and penetrations for a completely watertight condition.
  - g. Membrane flashing shall not be permanently exposed to sunlight.
5. Transitions:
  - a. At all flashing terminations to openings, expansion joints, and changes in height, provide metal and membrane formed end dams with all seams sealed watertight.
  - b. Provide compressible filler at the end of all flashings at steel lintels.
6. Protection:
  - a. Do not expose flashing membrane to sunlight for more than thirty (30) days prior to enclosure.
  - b. Do not allow the surface of the flashing membrane to come in contact with incompatible materials, including but not limited to polysulfide sealants, creosote, uncured coal tar products or EPDM.
- F. Openings and Penetrations in Exterior Weather Barriers:
  1. Install flashing extending a minimum 3 inches onto vertical wall and into rough opening with transition membrane.
  2. Hollow Metal Door Frames: Seal door frame to wall surface with transition membrane.
  3. Perimeter wood nailers at wall openings: Cover all exposed surfaces of wood nailers with transition membrane. Extend membrane over ICF, sheathing, masonry and metal framing.
  4. Aluminum frames: Seal frames to the wall surface with transition membrane.
  5. Service and Other Penetrations: Form flashing around penetrating item and seal to weather barrier surface.

6. Cladding Attachment Penetrations: provide application of butyl tape to the base of all masonry ties and subgirts installed with fasteners through weather barrier.
- G. Expansion Joints in Exterior Weather Barriers:
  1. Expansion joints are required at all structural expansion joints and along slip tracks in metal stud framing systems at walls. Provide manufacturer's recommended detailing at other locations with potential movement, including control joints in concrete masonry wall systems.
  2. Coordinate installation of new infill wall materials after removal of any existing cladding materials, to ensure that expansion joint at weather barrier plane is in line with expansion joint at exterior cladding.
  3. Install weather barrier materials at new infill wall, provide sealed termination bar secured at 6" o.c., extending a minimum of 4 inches onto the existing backup wall and weather barrier system. Ensure that all terminations of new weather barrier at existing is air- and water-tight.
  4. Install insulation and fire rated materials at gap as indicated in the Drawings or required for wall construction.
  5. Provide transition membrane and backer rod at gap as indicated in the Drawings, fully stripped in with fluid applied weather barrier system in full accordance with manufacturer details and requirements.
  6. Expansion joints at air barrier system shall be sealed air and watertight to expansion joint materials in roofing systems, with compatible materials.

#### **3.04 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Do not cover installed weather barriers until required inspections have been completed. Contractor is responsible for coordinating all inspections with Architect and/or Owner.
- C. Obtain approval of installation procedures by the weather barrier manufacturer based on a mock-up installed in place, prior to proceeding with remainder of installation.
- D. Take digital photographs of each portion of the installation prior to covering up.
- E. Weather Barrier Protection and Failure Protocol:
  1. Contractor failure to provide the protection specified will result in the following, at no cost to the Owner:
    - a. Replacement of all failed materials in full accordance with manufacturer requirements, to dry substrates. Failure is defined as inadequate adhesion, chemical deterioration, or blisters (entrapped air). After replacement the Contractor shall provide the above specified protection until completion of roofing materials.

#### **3.05 PROTECTION**

- A. Do not leave materials exposed to weather longer than recommended by manufacturer.

#### **END OF SECTION**

**SECTION 07 4213  
METAL WALL PANELS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Complete manufactured metal panel systems for walls and soffits, including related flashings, accessory components, and attachment of metal panel systems, including all required subgirt assemblies for walls and soffits to approved substrates.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 4000 - Cold-Formed Metal Framing: Wall panel substrate.
- B. Section 06 1000 - Rough Carpentry
- C. Section 07 2100 - Thermal Insulation.
- D. Section 07 2500 - Weather Barriers: Weather barrier under wall panels.

**1.03 REFERENCE STANDARDS**

- A. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document) 2015.
- B. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process 2022.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate allowable system pressures, dimensions, layout, joints, construction details, methods of anchorage.
- C. Samples: Submit two samples of wall panel and soffit panel, 12 inch by width of panel in size illustrating finish color, sheen, and texture.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in installing products of the type specified in this section with minimum three years of documented experience.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.
- B. Store prefinished material off the ground and protected from weather; prevent twisting, bending, or abrasion; provide ventilation; slope metal sheets to ensure proper drainage.
- C. Prevent contact with materials that may cause discoloration or staining of products.

**1.07 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Furnish a written warranty signed by the Panel Applicator for a two (2) year period from the date of substantial completion of the building guaranteeing materials and workmanship for the preformed metal panel system, flashings and penetrations.
- C. Furnish manufacturer's standard 20-year written finish warranty stating that architectural fluorocarbon finish will be:
  - 1. Free from fading or color change in excess of 5 NBS units as measured per ASTM D2244;
  - 2. Will not chalk in excess of a numerical rating of 7 when measured in accordance with standard procedures specified in ASTM D4214;
  - 3. Will not peel, crack, chip or delaminate

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Design is based on panels manufactured by Petersen Aluminum Corporation.
- B. Other Acceptable Manufacturers:
  - 1. Berridge Manufacturing Company: [www.berridge.com](http://www.berridge.com).
  - 2. Centria: [www.centria.com](http://www.centria.com).
  - 3. Fabral Wall and Roof Systems: [www.fabral.com](http://www.fabral.com)
  - 4. MBCI: [www.mbc.com](http://www.mbc.com).
  - 5. McElroy Metal: [www.mcelroymetal.com](http://www.mcelroymetal.com).
  - 6. Petersen Aluminum Corporation: [www.pac-clad.com](http://www.pac-clad.com).

### **2.02 MANUFACTURED METAL PANELS**

- A. Panel System: Factory fabricated prefinished metal panel system, site assembled.
  - 1. Provide exterior panels, soffit panels, and subgirt framing assembly.
  - 2. Design Loads: In addition to the self-weight of the panel systems, metal panel systems shall be designed to resist the maximum of the following: Wind Pressures indicated on the Structural Drawings, or the wind pressures required by the version of ASCE 7 referenced in the version of the International Building Code (IBC) for this project.
  - 3. Anchorage: Provide anchorage into approved substrate for complete metal panel system capable of resisting all required loads and pressures (i.e. gravity and wind). (Note: For ICF wall assemblies, It shall not be permitted to rely on ICF unit web components (e.g. plastic flanges buried in the insulating formwork) for anchorage of metal panel systems for walls)
  - 4. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.
  - 5. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.
  - 6. Fabrication: Formed true to shape, accurate in size, square, and free from distortion or defects; pieces of longest practical lengths.
  - 7. Corners: Factory-fabricated in one continuous piece with minimum 2 inch returns.
  - 8. Provide continuity of air barrier and vapor retarder seal at building enclosure elements in accordance with materials specified in Section 07 2500.
  - 9. Custom Fluoropolymer Coating System: Polyvinylidene fluoride (PVDF) multi-coat thermoplastic fluoropolymer coating system, including minimum 70 percent PVDF color topcoat and minimum total dry film thickness of 0.9 mil; color and gloss as scheduled in Section 01 6210 - Schedule of Materials and Colors.
- B. Exterior Wall Panels:
  - 1. Profile: Vertical; Highline S2 Series as manufactured by Petersen Aluminum Corporation.
  - 2. Material: Precoated steel sheet, 22 gage, 0.0299 inch minimum thickness.
  - 3. Panel Width: 16 inches.
  - 4. Color: As scheduled in Section 01 6210 - Schedule of Materials and Colors.
- C. Subgirt Framing Assembly:
  - 1. Profile as indicated; to attach panel system to approved substrate in a manner that is capable of resisting all required loads and pressures (i.e. gravity and wind). (Note: For ICF wall assemblies, It shall not be permitted to rely on ICF unit web components (e.g. plastic flanges buried in the insulating formwork) for anchorage of metal panel systems for walls)"
- D. Internal and External Corners: Same material, thickness, and finish as exterior sheets; profile to suit system; shop cut and factory mitered to required angles.
- E. Expansion Joints: Same material, thickness and finish as exterior sheets; 22 gage, 0.0299 inch thick; manufacturer's standard brake formed type, of profile to suit system.



- F. Trim, Closure Pieces, Caps, Flashings, Facias, and Infills: Same material, thickness and finish as exterior sheets; brake formed to required profiles.
- G. Anchors: Galvanized steel.

### **2.03 MATERIALS**

- A. Precoated Steel Sheet: Aluminum-zinc alloy-coated steel sheet, ASTM A792/A792M, Commercial Steel (CS)) or Forming Steel (FS), with AZ50/AZM150 coating; continuous-coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.

### **2.04 ACCESSORIES**

- A. Concealed Sealants: Non-curing butyl sealant or tape sealant.
- B. Fasteners: Manufacturer's standard type to suit application; steel, hot dip galvanized.
- C. Field Touch-up Paint: As recommended by panel manufacturer.
- D. Bituminous Paint: Asphalt base.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that building framing members are ready to receive panels.

### **3.02 PREPARATION**

- A. Install subgirts perpendicular to panel length, securely fastened to substrates and shimmed and leveled to uniform plane. Space at intervals indicated.

### **3.03 INSTALLATION**

- A. Install panels on walls and soffits in accordance with manufacturer's instructions.
- B. Protect surfaces in contact with cementitious materials and dissimilar metals with bituminous paint. Allow to dry prior to installation.
- C. Fasten panels to structural supports; aligned, level, and plumb.
- D. Locate joints over supports.
- E. Provide expansion and control joints where indicated or as recommended by the manufacturer.
- F. Use concealed fasteners unless otherwise approved by Architect.
- G. Where metal panels are installed on the ICF Wall System, install exterior gyp sheathing, weather barrier and furring channels over the ICF System to provide compliance with NFPA 285
- H. Seal and place gaskets to prevent weather penetration. Maintain neat appearance.

### **3.04 TOLERANCES**

- A. Maximum Offset From True Alignment Between Adjacent Members Butting or In Line: 1/16 inch.
- B. Maximum Variation from Plane or Location Indicated on Drawings: 1/4 inch.

### **3.05 CLEANING**

- A. Remove site cuttings from finish surfaces.
- B. Remove protective material from wall panel surfaces.
- C. Clean and wash prefinished surfaces with mild soap and water; rinse with clean water.
- D. Upon completion of installation, thoroughly clean prefinished aluminum surfaces in accordance with AAMA 609 & 610.

**END OF SECTION**



**SECTION 07 5400  
THERMOPLASTIC MEMBRANE ROOFING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Adhered system with thermoplastic TPO roofing membrane.
- B. Flashings.
- C. Roofing stack boots, roofing expansion joints, and walkway pads.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 1000 - Rough Carpentry: Wood nailers.
- B. Section 07 2200 - Roof and Deck Insulation
- C. Section 07 7200 - Roof Accessories: Roof-mounted units; prefabricated curbs.

**1.03 REFERENCE STANDARDS**

- A. ASTM D6878/D6878M - Standard Specification for Thermoplastic Polyolefin-Based Sheet Roofing 2021.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene with all related trades before starting work of this section.
  - 1. Review preparation and installation procedures and coordinating and scheduling required with related work.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating membrane materials, sealants, adhesives, flashing materials, fasteners, and other related materials.
- C. Shop Drawings: Submit drawings that indicate joint or termination detail conditions, conditions of interface with other materials, and paver layout.
- D. Manufacturer's Installation Instructions: Indicate membrane seaming precautions, finish coating installation, special procedures, and perimeter conditions requiring special attention.
- E. Manufacturer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and supplementary instructions given.
- F. Warranty Sample:
  - 1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
  - 2. Submit installer's certification that installation complies with warranty conditions for waterproof membrane.

**1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with at least five years of documented experience and approved by manufacturer.
- C. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.
- D. Roof System shall meet minimum requirements in accordance of ASCE 7 per code jurisdiction.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials in manufacturer's original containers, dry and undamaged, with seals and labels intact.

- B. Store materials in weather protected environment, clear of ground and moisture.
- C. Ensure storage and staging of materials does not exceed static and dynamic load-bearing capacities of roof decking.
- D. Protect foam insulation from direct exposure to sunlight.

#### **1.08 FIELD CONDITIONS**

- A. Do not apply roofing membrane during unsuitable weather.
- B. Do not apply roofing membrane when ambient temperature is below 40 degrees F or above 100 degrees F.
- C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.
- E. Schedule applications so that no partially completed sections of roof are left exposed at end of workday.

#### **1.09 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Special Warranty: Manufacturer's standard or customized form, without monetary limitation, ("NDL") in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: 20 years from date of Substantial Completion.
  - 2. Contractor's Workmanship Warranty: Five (5) years from date of Substantial Completion.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Thermoplastic Polyolefin (TPO) Membrane Roofing Materials:
  - 1. Carlisle Roofing Systems, Inc: [www.carlisle-syntec.com/#sle](http://www.carlisle-syntec.com/#sle).
  - 2. Firestone Building Products, LLC: [www.firestonebpco.com/#sle](http://www.firestonebpco.com/#sle).
  - 3. GAF: [www.gaf.com/#sle](http://www.gaf.com/#sle).
  - 4. Johns Manville: [www.jm.com/#sle](http://www.jm.com/#sle).
  - 5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Insulation:
  - 1. Reference Section 07 2200 - Roof and Deck Insulation

#### **2.02 MEMBRANE ROOFING AND ASSOCIATED MATERIALS**

- A. Membrane Roofing Materials:
  - 1. TPO: Thermoplastic polyolefin (TPO) complying with ASTM D6878/D6878M, sheet contains reinforcing fabrics or scrims.
    - a. Thickness: 60 mil, 0.060 inch, minimum.
  - 2. Sheet Width: Factory fabricated into largest sheets possible.
  - 3. Solar Reflectance: 0.75, minimum, initial, and 0.65, minimum, 3-year, certified by Cool Roof Rating Council.
  - 4. Thermal Emissivity: 0.80, minimum, initial, and 0.79, minimum, 3-year, certified by Cool Roof Rating Council.
  - 5. Color: White.
- B. Seaming Materials: As recommended by membrane manufacturer.
- C. Flexible Flashing Material: Same material as membrane.

#### **2.03 DECK SHEATHING AND COVER BOARDS**

- A. Reference Section 07 2200 - Roof and Deck Insulation

## **2.04 INSULATION**

- A. Reference Section 07 2200 - Roof and Deck Insulation

## **2.05 ACCESSORIES**

- A. Roofing Expansion Joint Flashing: Sheet metal, as specified in Section 07 6200.
- B. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.
- C. Membrane Adhesive: Low VOC as recommended by membrane manufacturer.
- D. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.
- E. Thinners and Cleaners: Low VOC as recommended by adhesive manufacturer, compatible with membrane.
- F. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer.
- G. TPO Coated Metal, white.
- H. Strip Reglet Devices: Galvanized steel, maximum possible lengths per location, with attachment flanges.
- I. Sealants: As recommended by membrane manufacturer.
- J. Roof Drains:
  - 1. Primary Roof Drains and secondary overflow scuppers or roof drains as specified shall be as specified in Division 22 – Plumbing Piping in sizes as indicated on the plumbing drawings. The furnishing of the roof drains will be the responsibility of the Plumbing Contractor and specified in Division 22.
- K. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.
- L. Walkway Pads: Suitable for maintenance traffic, contrasting color or otherwise visually distinctive from roof membrane.
  - 1. Composition: Roofing membrane manufacturer's standard.
  - 2. Size: 18 by 18 inch.
  - 3. Surface Color: White or yellow.
  - 4. Provide around all mechanical and HVAC equipment and other locations shown on the roof plan.
- M. Termination Bars: Pre-drilled, stainless steel or aluminum, approximately 1" wide X 1/8" thick, with anchors.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck is supported and secure.
- C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
- D. Verify deck surfaces are dry and free of snow or ice and/or water, dew, etc.
- E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and nailing strips and reglets are in place.

### **3.02 MEMBRANE APPLICATION**

- A. Fully adhere membrane roofing over the installed insulation per membrane roof system manufacturer's written instructions. Comply with ASTM D 5036 for sheet install.

- B. Bonding Adhesive: Apply adhesive to the substrate and the underside of the membrane at the rate required by the manufacturer. Allow to partially dry, "tacky", before rolling in the membrane. Do not apply to splice areas. Broom membrane into adhesive eliminating wrinkles.
- C. Seams: Clean seam areas, overlap membrane roofing, and hot-air weld side and end laps of membrane roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation.
  - 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet membrane.
  - 2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
  - 3. Repair tears, voids, and lapped seams in roofing that do not comply with requirements.
  - 4. Test lap edges with a probe to verify seam weld continuity. Apply lap sealant to seal cut edges of the field sheet membrane.
  - 5. Random seam weld test samples will be taken.
- D. At intersections with vertical surfaces:
  - 1. Extend membrane over cant strips and up a minimum of 4 inches onto vertical surfaces.
  - 2. Fully adhere flexible flashing over membrane and up to reglets.
  - 3. Secure flashing to nailing strips at 4 inches on center.
  - 4. Insert flashing into reglets and secure.
- E. At edge stops, extend membrane under edge stop and to the outside face of the wall.
- F. Install roofing expansion joints where indicated. Make joints watertight.
  - 1. Install prefabricated joint components in accordance with manufacturer's instructions.

### **3.03 FIELD QUALITY CONTROL**

- A. Require site attendance of roofing and insulation material manufacturers minimum of 3 times during installation of the Work.
- B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
- C. Repair or remove and replace components of membrane roofing system where inspections indicate that they do not comply with specified requirements.

### **3.04 CLEANING**

- A. Remove all markings from finished surfaces.
- B. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their instructions.
- C. Contractor shall power wash the roof upon completion to remove all construction related dirt and debris.
- D. Repair or replace defaced or damaged finishes caused by work of this section.

### **3.05 PROTECTION**

- A. Protect installed roofing and flashings from construction operations and trades.
- B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

**END OF SECTION**

**SECTION 07 6113**  
**STANDING SEAM SHEET METAL ROOFING**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

- A. Work Included: The contractor shall provide all labor, material, and administration and other items to provide a complete pre-finished engineered 180 degree standing seam metal roof system complying with performance requirements indicated and capable of withstanding structural movement, thermally induced movement and exposure to weather without failure or infiltration of water into the building interior.
- B. Coordinate pre-finished engineered standing seam metal roof system with roofing substructure work.
- C. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

**1.02 SECTION INCLUDES**

- A. Preformed and pre-finished manufacturer's fully engineered standing seam metal roof system with continuous interlocking field formed seams, concealed clips and fastening devices.
- B. Color coordinated ridge, hip, valley, gable, eave, corner, rake, headwall, counter flashings and miscellaneous flashings and attaching devices.
- C. Provide concealed clips, fasteners, closures and factory and field applied sealants as necessary to meet design criteria and ensure a weather-tight installation.
- D. Specified underlayment.

**1.03 RELATED SECTIONS**

- A. Section 05 1200 - Structural Steel Framing
- B. Section 05 3123 – Steel Roof Decking
- C. Section 06 1000 – Rough Carpentry
- D. Section 07 7200 – Roof Accessories
- E. Section 07 2200 – Roof and Deck Insulation

**1.04 REFERENCES**

- A. ASCE 7-(Latest Revision) - American Society of Civil Engineers "Minimum Design Loads for Buildings and Other Structures"

**1.05 SYSTEM DESCRIPTION**

- A. DESIGN REQUIREMENTS
  - 1. The structural standing seam metal roof system, including: panels, flashings, attachment clips and attachment screws shall be designed by the manufacturer of the standing seam metal roof system per ASCE-7 (Latest Revision) to meet the local building code as defined by the design professional. Refer to the drawings for applicable building codes. The design criteria shall include the following:
    - a. Listing of applicable loads.
    - b. Listing of the building importance factor (life safety factor).
    - c. Design wind speed.
    - d. Building exposure factor.
    - e. Other necessary criteria.

2. The manufacturer of the engineered standing seam metal roof system shall provide an engineered analysis of the roofing system, sealed by a registered Structural Engineer employed by the manufacturer and licensed in the State of Texas, verifying that the product and attachment methods will resist wind pressures imposed upon it pursuant to the applicable building codes and that the roofing system fully complies with all specified requirements.
3. Provide UL90 rated roofing panels that have been tested in accordance with UL 580 (Flat Panel) criteria.
4. Provide preformed factory panel system that has been pre-tested and certified by manufacturer to comply with specified requirements under installed conditions.
5. When possible, provide one-piece, single continuous length roof panel from ridge to eave. When panel length exceeds lengths required by manufacturing constraints, field roll-formed panels may be used when approved by the Architect.
  - a. When field roll-formed panels are approved by the Architect, the following criteria shall be met:
    - 1) The panel forming machine shall be U.L. certified capable of producing metal roof panels in compliance with these written specifications.
    - 2) The panel forming machine shall be owned by the panel manufacturer and shall be operated by factory authorized personnel.
6. Provide continuous interlocking field formed standing seam that inherently increases load span capability, stiffness and flexural stress handling capacity.
7. Provide continuous factory installed hot-melt butyl sealant within the confines of the female flange.
8. Provide preformed factory panel that has been tested and approved for a Class 4 Impact (Hail) resistance rating per UL 2218. Listing shall be present on the UL website (Refer to Underwriters Laboratories website at [www.ul.com/](http://www.ul.com/))

**B. ENGINEERING REQUIREMENTS**

1. Panel properties shall be determined in accordance with latest edition of American Iron and Steel Institute's "Cold Formed Steel Design Manual," using "effective width" concepts.
2. Wind uplift design for roof assemblies shall be calculated by the structural standing seam metal roofing system manufacturer per ASTM E 1592. Calculations shall include establishment of ultimate and allowable roof system uplift capacities for both the "field" and "areas of discontinuity".
3. Provide confirmation of positive and negative values buckling moments and uplift capacity determined by full-scale tests.

**C. SUBSTRATE CRITERIA**

1. Standing Seam Metal Roofing: Engineered standing seam metal roof system shall be installed over the specified self-adhering underlayment membrane on a plywood substrate over rigid insulation over metal decking that is capable of withstanding UL Class 90 loading as per the UL 580 (Flat Panel) requirements applied at 90 degrees to surface and spaced as shown on the approved shop drawings.
2. Waterproof Membrane Underlayment: Apply self-adhering waterproof membrane under entire roof surface per manufacturers written instructions.

**D. ENVIRONMENTAL REQUIREMENTS: Actual independent laboratory certified test results must be submitted.**

1. Resistance to air infiltration:
  - a. .004 cfm per linear foot of joint when tested in accordance with ASTM E 1680 at static test pressure differential of 12.00 psf.
2. Resistance to water infiltration:
  - a. No leakage through panel joints when tested in accordance with ASTM E 1646 at static test pressure differential of 20.00 psf.



## **1.06 SUBMITTALS**

- A. Shop drawings, product data, and samples under provisions of Section 01 3000 – Administrative Requirements.
- B. PRODUCT DATA: Submit manufacturer's specifications, engineered detail drawings, and installation instructions.
- C. SHOP DRAWINGS
  - 1. Submit approval / design drawings produced by the panel system manufacturer indicating thickness and dimensions of parts, fastenings and anchoring methods, details and locations of seams, transitions and other provisions necessary for thermal expansion and contraction.
  - 2. Indicate roof terminations, clearly showing flashings and change of direction caps.
  - 3. Clearly indicate locations of field and factory applied sealant.
  - 4. Show locations, spacing patterns and types of hold-down clips and fasteners.
  - 5. Provide 24" x 36" blue line or Auto CAD produced drawings provided by the engineered standing seam metal roof system manufacturer showing complete roof plan, roof panel layout, and cross section details for every individual condition of the entire roof system.
- D. SAMPLES
  - 1. Submit two samples, 12" long x full width of panel, showing proposed metal gauge and seam profile.
  - 2. Submit color samples on metal for Architect's verification based on color schedule. Upon selection of approved color, submit 12"x12" painted metal sample for approval. Paper samples not acceptable.
- E. TEST REPORTS
  - 1. Submit certified test reports prepared by (UL) Underwriters Laboratories, Inc. indicating wind uplift rating of proposed roof system.
  - 2. Submit verification the panel system meets the Environmental Conditions for the indicated test pressures and performance listed for Air and Water Infiltration.
- F. ENGINEERED DESIGN CALCULATIONS
  - 1. Submit panel system manufacturer's design calculations verifying the panel system meets the specified building code as defined in Section 1.4 System Description, A. Design Requirements listed above.
  - 2. Design calculations shall be sealed by a registered Structural Engineer employed by the manufacturer of the panel system and licensed in the State of Texas.
- G. CERTIFICATION
  - 1. Submit manufacturer's certification that materials and finishes meet specified requirements.
  - 2. Submit written verification of panel Applicator's factory installation training performed by the engineered standing seam metal roof system manufacturer and a copy of the Panel Applicator's "Authorized Applicator" certificate.
- H. CLOSEOUT SUBMITTALS
  - 1. Submit under provisions of Section 01 7800 - Closeout Submittals.
  - 2. Submit Material Safety Data Sheets under provisions of Section 01 7800 – Closeout Submittals for the following items:
    - a. All mastics, glues, and adhesives
    - b. Thermal insulation (excluding fiberglass, foam, rubber)

## **1.07 QUALITY ASSURANCE**

- A. MANUFACTURER'S QUALIFICATIONS

1. Minimum twenty (20) years experience in the fabrication of engineered standing seam metal roof systems on projects of similar size and scope. Upon request, submit a minimum of five (5) project references for Architect's review. List project address, date of installation, Architects and Owner's name and telephone numbers.
  2. No other manufacturer of engineered standing seam metal roof systems will be accepted without prior written approval of the Architect and based upon the manufacturer verifying the product can meet or exceed all performance criteria listed in these specifications.
  3. Requests to be listed as an approved manufacturer must be submitted in writing a minimum ten (10) days prior to bid date accompanied by product literature, technical information, sealed engineer's calculations verifying conformance, and a product sample. Approved manufacturers will only be set forth in a written and issued addendum.
  4. No substitutions will be permitted after the bid date.
- B. APPLICATOR QUALIFICATIONS
1. Panel Applicator must have a minimum of five (5) years experience in the application of engineered standing seam metal roof systems.
  2. Panel Applicator must be factory trained by the metal roof system manufacturer prior to the bid date in order to obtain a contract for installation.
  3. Use an adequate number of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work in this Section.
  4. Use equipment of adequate size, capacity and numbers to accomplish the work of this Section in a timely manner.
  5. Upon request, submit a minimum of five (5) successfully completed projects of similar size and scope. List project address, date of installation, Architect and Owner's name and telephone numbers.
  6. Single Source Responsibility: Provide all items of engineered standing seam metal roof system work specified herein by a single roofing contractor to provide undivided responsibility.
- C. REGULATORY REQUIREMENTS
1. Comply with all requirements of applicable building codes and other agencies having jurisdiction for positive and negative design loads of engineered standing seam metal roof systems.
  2. Engineered standing seam metal roof system shall be previously tested and passed for UL-90 wind uplift, class UL 580 (Flat Panel) procedure. Products must be listed on the Underwriters Laboratories website at: <http://www.ul.com/>

## **1.08 DELIVERY, STORAGE AND HANDLING**

- A. DELIVERY
1. Delivery of material shall be made only after suitable facilities for its storage and protection area available on the site.
  2. Protect products and accessories from damage and discoloration during transit and at project site.
  3. Upon receipt of pre-finished preformed metal panels, flat sheets, flashings and panel accessories, Panel Applicator shall examine each container for damage and for completeness of the consignment.
- B. STORAGE
1. Store materials out of the weather in a clean, dry place. One end of each container should be slightly elevated and covered with a loose weatherproof covering to prevent condensation.
  2. Panels and/or flashings with strippable film must not be stored in areas exposed to direct sunlight. Remove strippable film before installation.
  3. Care should be taken to prevent contact with any substance that may cause discoloration.
  4. Store materials to provide ventilation and prevent bending, abrasion or twisting.

5. Do not overload roof structure with stored materials. Do not permit material storage or traffic on completed roof surfaces.
- C. HANDLING
  1. Care should be taken to avoid gouging, scratching or denting.
  2. Do not allow traffic on completed roof. If required, provide cushioned walk boards.
  3. Protect installed products from damage caused by foreign objects and construction until completion of project.
  4. Comply with pertinent provisions of Supplementary General Conditions.

#### **1.09 WARRANTY**

- A. Furnish manufacturer's standard 20-year written finish warranty stating that architectural fluorocarbon finish will be:
  1. Free from fading or color change in excess of 5 NBS units as measured per ASTM 2244-68;
  2. Will not chalk in excess of a numerical rating of 7 when measured in accordance with standard procedures specified in ASTM D 659-74;
  3. Will not peel, crack, chip or delaminated.
- B. Furnish a written warranty signed by the Panel Applicator for a five (5) year period from the date of substantial completion of the building guaranteeing materials and workmanship for weathertightness of the roofing system, flashings, penetrations and against all leaks.
- C. Special Weathertight Warranty: Furnish manufacturer's 20-year, full system, non-prorated, no dollar limit weathertight warranty to be jointly signed by the manufacturer and Panel Applicator. Warranty shall include full cost of repair and replacement.
- D. Protect products and accessories from damage and discoloration during transit and at project site. Store sheets and components in dry storage area to prevent condensation.
- E. Do not overload roof structure with stored materials. Do not permit material storage or traffic on completed roof surfaces.

#### **1.10 PRE-INSTALLATION CONFERENCE**

- A. Convene prior to commencing work of this Section and Referenced Sections.
- B. Attendants: Architectural Observer, Owner's Representative, Contractor, Roof Consultant, Panel Applicator, installer of each component of associated work, installers of deck or substrate construction to receive roofing work, Roofing system manufacturer's technical representative.
- C. Record discussion, decisions and agreements reached and furnish a copy to each attendant.
- D. Review installation procedures and coordination required with related Work.
- E. Tour representative areas of roofing substrates, inspect and discuss condition of substrates, roof drains, curbs, penetrations, wood nailers and other preparatory work performed by other trades.
- F. Review structural loading limitations of steel deck and inspect deck for loss of flatness and as required for mechanical fastening.
- G. Review roofing system requirements (approved manufacturer's shop drawings, specifications and other contract documents).
- H. Review required submittals.
- I. Review and finalize construction schedule related to roofing work and verify availability of materials, installer's personnel, equipment and facilities needed to avoid delays.
- J. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing.
- K. Contractor to document the meeting with written minutes and copy all in attendance.

## **PART 2 – PRODUCTS**

### **2.01 MANUFACTURERS**

- A. **ENGINEERED STANDING SEAM METAL ROOF SYSTEM:** Prior approval is required per Supplementary General Conditions, and alternate manufacturers must be approved per written and issued addendum a minimum of ten (10) days prior to the bid date.
  - 1. Architectural Building Components/McElroy; Maxima ADV
  - 2. Berridge Manufacturing Company; Double-Lock Zee-Lock Panel
  - 3. Fabral Wall and Roof Systems; Double Locked PowerSeam
  - 4. MBCI; “Superlok 216”
  - 5. Peterson Aluminum Corp.; Tite-Loc Plus
  - 6. Substitutions: See Section 01 6000 - Product Requirements.
- B. **SELF-ADHERING UNDERLAYMENT:**
  - 1. Carlisle; WIP300HT
  - 2. Tamko; “TW Metal & Tile”
  - 3. GCP Applied Technologies; “Ultra”
  - 4. GAF; STORMGARD
  - 5. Substitutions: See Section 01 6000 - Product Requirements.
- C. **INSULATION:** Reference Section 07 2200 – Roof and Deck Insulation of these specifications for Roof and Deck Insulation.
- D. **PLYWOOD SUBSTRATE:** Reference Section 06 1000 – Rough Carpentry of these specifications for requirements regarding plywood substrate.
- E. **SUBSTITUTIONS**
  - 1. Requests to be listed as an approved manufacturer must be submitted in writing a minimum ten (10) days prior to bid date accompanied by product literature, technical information, sealed engineer’s calculations verifying conformance, and a product sample. Approved manufacturers will only be set forth in a written and issued addendum.
  - 2. Alternate manufacturers must fully comply with all specified requirements.

### **2.02 MATERIALS**

- A. **PANELS**
  - 1. Pre-finished Galvalume sheet, ASTM AZ50 made of 55% aluminum, 1.6% silicon and the balance zinc as described in ASTM specification A792.
  - 2. Panels shall be 24 gauge with Kynar 500 Finish.
  - 3. Factory fabricated panel with integral continuous overlapping seams suitable for continuous locking or crimping by mechanical means during installation. On-site or field roll formed panel profiles will not be acceptable except as approved by the Architect when panel lengths exceed manufacturing constraints.
  - 4. Seam Size:
    - a. Rib: 2" high, 180 degree seam.
      - 1) Provide factory installed, high grade, hot-melt elastomeric sealant, within the confines of female seam flange, on bottom edge of female seam flange, designed to seal against adjacent male panel leg.
  - 5. Panel: Striated
- B. **CLIP/FASTENER ASSEMBLIES**
  - 1. Typical clip
    - a. UL 90 requirements
      - 1) UL-90 Fasteners: as per approved manufacturer’s engineered shop drawings.
      - 2) UL Rated Clip: Sliding 22 gauge galvanized steel hook in combination with a double fastened 16 gauge galvanized steel base, both at Fy (MIN) = 33 ksi. Clip hook shall have a shop installed hot-melt butyl sealant for continuity of seal at clip locations.

- b. Typical Low Clip:
  - 1) Requirements:
    - (a) UL-90 Fasteners: as per approved manufacturer's engineered shop drawings.
    - (b) Sliding 26 gauge at  $F_y=40\text{ksi}$  (MIN) galvanized steel hook in combination with a double fastener 18 gauge at  $F_y = 50 \text{ ksi}$  (MIN) galvanized steel base. Clip hook shall have a shop installed hot-melt butyl sealant for continuity of seal at clip locations.
  - c. Standard Fasteners: Same as UL 90 fasteners specified above.
- C. ACCESSORIES
  - 1. Provide manufacturer's standard accessories and other items essential to completeness of standing seam roof installation.
  - 2. Roof Jacks: Manufacturer's standard EPDM with an aluminum sealing base ring; for openings twelve (12) inches or smaller.
  - 3. Roof Curbs: fabricated to the specifications of the engineered standing seam metal roof manufacturer, thereby assuring compatibility with the roof construction framing and covering. Roof curbs shall be of sufficient size and design to coordinate with requirements for support of heat and smoke vents specified in another Division 7 Section. Roof curb flashing and framing shall provide for the expected expansion and contraction of the engineered standing seam metal roofing system.
  - 4. Gutters and downspouts will be fabricated per specification Section 07 6200 - Sheet Metal Flashings and Trim.
- D. FIELD SEALANTS
  - 1. Color coordinated primerless urethane as recommended and engineered by panel manufacturer.
  - 2. Do not use sealants containing asphalt.
- E. SELF-ADHERING UNDERLAYMENT MEMBRANE
  - 1. Flexible, self-adhering rubberized asphalt sheet membrane with a polymeric film on the surface and a removable silicone-treated release sheet on the adhesive side.
  - 2. Self-Adhering underlayment membrane shall be rated for high temperature resistance up to 250 degrees F.
  - 3. Self-Adhering underlayment membrane shall have a maximum permeance rating of 0.05 perms.
  - 4. Minimum thickness shall be 30 mils.
- F. RIGID INSULATION: Reference Section 07 2200 – Roof and Deck Insulation of these specifications for Roof and Deck Insulation for attachment procedures.
- G. PLYWOOD SUBSTRATE Reference Section 06 1000 – Rough Carpentry of these specifications for requirements regarding plywood substrate.

## 2.03 FABRICATION

- A. Panels
  - 1. Provide factory formed panel widths of 16", with a 2" high standing seam.
  - 2. On-site or field roll formed panels are not acceptable except as approved by the Architect when panel lengths exceed manufacturing constraints..
  - 3. Provide panels in full length from ridge to eave.
  - 4. Roof panels shall have flush horizontal and vertical surfaces to facilitate sealing at terminations. Panel configurations that create voids and require supplemental closure devices are acceptable.
  - 5. Panel seams shall interlock entire length of seam.
  - 6. Design standing seam to lock up and resist joint disengagement during design wind uplift conditions as calculated to comply with local building codes and design uplift criteria.

7. Provide factory sealant within confines on trailing edge of female seam leg to aid in resistance of leaks and provide panel-to-panel seal while allowing expansion and contraction movement, and the seams shall be continuously locked or crimped together by mechanical means during installation.
- B. Clips
  1. Provide UL listed clip designed to allow panels to thermally expand and contract and provide a minimum of  $\pm 1$  inch of thermal movement. Clip shall incorporate a self-centering feature to allow a minimum of 1" of movement in both directions along panel length.
  2. Clip shall be designed to meet positive and negative pressures as calculated per local building code and as engineered by the roofing system manufacturer.
- C. Engineer panels to use concealed anchors that permit expansion and contraction, except at end laps, ridges and hips.
- D. Trim/Flashings
  1. Pre-finished sheet metal designed by the manufacturer in the same gauge, material and finish as the structural standing seam metal roofing system.
  2. Locations, design, sealing and fastening methods as per the manufacturer's approved engineered shop drawings.

## **2.04 FINISH**

- A. Fluorocarbon Coating:
  1. Full strength 70% Kynar 500® coating baked coil-coated finish.
  2. Dry-film thickness of 1.0 mil including primer.
  3. 0.3 mil baked on epoxy primer.
  4. Color: As selected by Architect from manufacturer's standard finishes.

## **PART 3 - EXECUTION**

### **3.01 CONNECTING WORK**

- A. General: Provide metal roofing panels of full length from eave to ridge when possible.
  1. Field cutting by torch is not permitted.
  2. Do not apply roofing during inclement weather.
  3. Do not apply roofing to damp or frozen deck surface.
  4. Do not expose materials vulnerable to water, wind or sun damage in quantities greater than can be weatherproofed during the same day.
  5. Rigidly fasten ridge of metal roof panels and allow free eave movement due to thermal expansion and contraction per the approved shop drawings.
  6. Install screws fasteners with power tools having controlled torque.
  7. Locate and space fasteners per the approved shop drawings in true vertical and horizontal alignment. Exposed fasteners in roofing panels will not be permitted.
  8. Install Ridge, Hip and penetration flashings per the approved shop drawings as work progresses. Position roof jacks only in the flat of the panel; do not alter standing seam ribs.
- B. The Panel Applicator shall examine all surfaces on which their work is to be applied, and shall notify the architect in writing if not suitable to receive their work. Work on any surface shall constitute acceptance of this surface by the Panel Applicator. After beginning installation, install approximately 500 square feet of panels for Architect's approval, before proceeding with substantial work.
- C. PLYWOOD SUBSTRATE AND NAILERS: Reference Section 06 1000 - Rough Carpentry of these specifications for requirements regarding plywood substrate.

### **3.02 FIELD MEASUREMENTS**

- A. Panel Applicator must take field measurements to verify or supplement dimensions indicated prior to fabrication of any materials. Where field measurements cannot be made without delaying the work, either establish opening dimensions and proceed with fabricating panels without field measurements or allow for trimming panel units.

### **3.03 RIGID BOARD INSULATION INSTALLATION**

- A. Reference Section 07 2200 – Roof and Deck Insulation of these specifications for Roof and Deck Insulation attachment procedures.

### **3.04 PLYWOOD SUBSTRATE INSTALLATION**

- A. Reference Section 06 1000 – Rough Carpentry of these specifications for requirements regarding plywood substrate.

### **3.05 WATERPROOF UNDERLAYMENT INSTALLATION**

- A. Apply waterproof underlayment over entire roof surface perpendicular to metal roofing panels and over parapet blocking per manufacturer's written instructions, but with not less than six (6) inch laps at vertical (side) laps and four (4) inch horizontal (top and bottom) laps.
- B. Install an extra layer of minimum 36" wide waterproof membrane down all valley, rake wall and gable conditions, using a minimum six (6) inch horizontal (top and bottom) lap.

### **3.06 METAL ROOFING INSTALLATION**

- A. Workmanship shall conform to standards set forth in the architectural sheet metal manual as published by SMACNA.
- B. Comply with manufacturer's instructions for assembly, installation, and erection in order to achieve a weather tight installation. Install in accordance with approved shop drawings. Roofing system shall be inspected by manufacturer's technical representative. Contractor shall make all repairs necessary to ensure warranty compliance.
  - 1. Anchor securely in place using clips and fasteners spaced in accordance with manufacturer's recommendations for design wind load criteria.
  - 2. Panels should be installed in such a manner that horizontal lines are true and level and vertical lines are plumb.
  - 3. Field apply sealant to penetrations, transitions, and other locations as necessary (not inside the standing seam ribs) for an airtight, waterproof installation.
  - 4. Remove all protective film, if any, before installation of materials.
- C. Dissimilar Metals:
  - 1. Do not allow panels or flashings to come into contact with dissimilar metals.

### **3.07 CLEAN UP**

- A. Clean exposed surfaces of work promptly after completion of installation.
- B. Only minor scratches and abrasions will be allowed to be touched up. Any other damaged material shall be replaced.
- C. Leave work areas clean, free from grease, dirt, finger marks and stains.
- D. Remove scrap and debris from surrounding grounds and work areas daily.

### **3.08 PROTECTION**

- A. Metal Roofing: Protect work as required to ensure that engineered standing seam metal roof system will be without damage at time of final completion.
- B. Plywood Sheathing: Cover plywood sheathing as soon as possible with specified underlayment for protection against excessive moisture prior to roofing application.

**END OF SECTION**





**SECTION 07 6200  
SHEET METAL FLASHING AND TRIM**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Fabricated sheet metal items, including flashings, counterflashings, gutters, and downspouts.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 1000 - Rough Carpentry: Wood nailers for sheet metal work.

**1.03 REFERENCE STANDARDS**

- A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2020.
- B. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2022.
- C. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2022.
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2023.
- E. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2023.
- F. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.
- G. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric) 2014.
- H. ASTM B749 - Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products 2020.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene one week before starting work of this section.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
- C. Submit 12 inch long, completely finished units of specified factory-fabricated products exposed as finished work.

**1.06 QUALITY ASSURANCE**

- A. Perform work in accordance with SMACNA (ASMM) requirements and standard details, except as otherwise indicated.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials that could cause discoloration or staining.

**1.08 WARRANTY**

- A. Manufacturer's Warranty: Provide manufacturer's 20-year, non-prorated warranty covering color fade, chalking and film integrity for all "Kynar 500": pre-finished metal.
- B. Contractor's Warranty: Provide Owner a written warranty which shall warrant sheet metal work to be free of leaks and defects in materials and workmanship for five (5) years after date of final acceptance by Owner.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Acceptable Sheet Metal Manufacturers
  - 1. Metal Building Components, Inc.: [www.mbc.com](http://www.mbc.com)
  - 2. Petersen Aluminum Corporation: [www.pac-clad.com](http://www.pac-clad.com)
  - 3. Vincent Brass and Aluminum Company: [vincentmetals.com](http://vincentmetals.com)
  - 4. Substitutions: See Section 01 6000 - Product Requirements

### **2.02 SHEET MATERIALS**

- A. Roof flashing shall be dark bronze u.n.o. in the drawings.
- B. Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage, (0.0239 inch) thick base metal.
- C. Pre-Finished Galvanized Steel: ASTM A 653/A 653M, with G90/Z275 zinc coating; minimum 0.02 inch thick, 24 gauge base metal, shop pre-coated with PVDF coating.
  - 1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
  - 2. "Kynar 500" or "Duranar 200"
  - 3. Color: As selected by Architect from manufacturer's full line of colors. Provide custom colors when needed to match other materials shown on the drawings or referenced in the Schedule of Materials and Colors.
- D. Aluminum: ASTM B209 (ASTM B209M); 0.032 inch thick; anodized finish of color as selected.
  - 1. Clear Anodized Finish: AAMA 611 AA-M12C22A41 Class I clear anodic coating not less than 0.7 mils thick.
  - 2. Color Anodized Finish: AAMA 611 AA-M12C22A42/44 Class I integrally or electrolytically colored anodic coating not less than 0.7 mils thick.
- E. Pre-Finished Aluminum: ASTM B209 (ASTM B209M); 0.032 inch thick; plain finish shop pre-coated with fluoropolymer coating.
  - 1. Fluoropolymer Coating: High Performance Organic Finish, AAMA 2604; multiple coat, thermally cured fluoropolymer finish system.
  - 2. Color: As selected by Architect from manufacturer's full line of colors. Provide custom colors when needed to match other materials shown on the drawings or referenced in the Schedule of Materials and Colors.
- F. Lead: ASTM B749, 2.5 lb/sq ft thick.
- G. Stainless Steel: ASTM A666 Type 304, soft temper, 0.015 inch thick; smooth No. 4 finish.

### **2.03 ACCESSORIES**

- A. Fasteners: Same material and finish as flashing metal , with soft neoprene washers.
  - 1. Mechanical Fasteners
    - a. Nails: Compatible with material fastened, flathead, wire, barbed, slating type.
    - b. Washers: Lead or neoprene.
    - c. Screws: Self-tapping sheet metal type compatible with material fastened.
    - d. Rivets: Stainless steel and cadmium plated material, closed end, type and size as recommended by sheet metal manufacturer.
    - e. Concrete and Masonry Fasteners
      - 1) Round-head stainless steel screw and neoprene washer with lead expansion anchor, FS FF-S-325, Group IV, Type II.
      - 2) Acceptable Product: Rawl Plug, The Rawl Plug Company, Inc.
- B. Flashing Underlayment

1. Grace Ultra and Vycor, a self-adhering membrane composed of high density, cross-laminated polyethylene film coated on one side with butyl rubber adhesive, and covered with a disposable silicone-coated release sheet, and conforms to the following physical properties:
  2. Color: Gray-Black
  3. Thickness: 0.76 mm (30 mil); ASTM D 3767 Method A
  4. Tensile Strength: 250 psi; ASTM D 412
  5. Elongation: 250%; ASTM D 412
  6. Low Temperature Flex: Unaffected at -20F
  7. Adhesion to Plywood: 525 N/m; ASTM D 903; (3.0 lb/in width)
  8. Permeance (Max): 2.9 ng/msPa; ASTM E 96
  9. Material Weight: 1.1 kg/m (0.22lb/sq ft)
- C. Mastic Sealant: One- or Two-Part Polyurethane; non-hardening, non-skinning, nondrying, non-migrating sealant.
- D. Bituminous Coating: FS TT-C-494 or SSPC Paint 12, solvent type bituminous mastic, nominally free of sulfur, compounded for 15 mil dry film thickness per coat.
- E. Adhesives: Type recommended by flashing sheet manufacturer for waterproof and weather resistant seaming and adhesive application of flashing sheet.
- F. Metal Accessories: Sheet metal clips, straps, anchoring devices and similar accessory units as required for installation of work, matching or compatible with material being installed, non-corrosive, size and gauge required for performance.
- G. Elastic Flashing Filler: Closed cell polyethylene or other soft closed cell material recommended by elastic flashing manufacturer as filler under flashing loops to ensure movement with minimum stress on flashing sheet.
- H. Reglets: Metal or plastic units of type and profile indicated, compatible with flashing indicated, non-corrosive.
- I. Flux: Phosphoric acid type, manufacturer's standard. For use with steel or copper: Rosin flux

## **2.04 FABRICATION**

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Fabricate cleats of same material as sheet, minimum four inches wide, interlocking with sheet.
- C. Form pieces in longest possible lengths.
- D. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- E. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- F. Lap joints 1-inch minimum. Rivet and solder joints on parts that are to be permanently and rigidly assembled.
- G. Expansion Provisions: Where lapped or bayonet type expansion provisions in work cannot be used or would not be sufficiently waterproof or weatherproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant concealed within joints.
- H. Sealant Joints: Where movable, non-expansion type joints are indicated or required for proper performance or work, form metal to provide for proper installation of Elastomeric sealant in compliance with SMACNA standards.
- I. Tin edges of copper sheet to be soldered; solder shop formed metal joints, and after soldering, remove flux, wipe and wash solder joints clean; provide weathertight joints.
- J. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- K. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

- L. Fabricate flashings to allow toe to extend 2 inches over roofing gravel. Return and brake edges.

## **2.05 FABRICATED ITEMS**

- A. Coping Cap Flashings:
  - 1. Minimum 24 gauge Kynar 500 pre-finished galvanized steel formed in maximum 10 feet length sheets.
  - 2. Provide expansion slip joints at maximum 10 feet on center.
- B. Flashings and Counterflashings:
  - 1. Minimum 24 gauge hot-dip galvanized steel formed in maximum 10 feet lengths.
  - 2. All flashings and counterflashings exposed to view shall be Kynar 500 pre-finished galvanized steel
- C. Drip Flashing:
  - 1. Drip flashing shall be minimum 24 gauge Kynar 500 pre-finished galvanized steel formed in maximum 10 ft. lengths.
- D. Roof Penetrations and Umbrella Counterflashing: Minimum 24 gauge hot-dip galvanized steel two piece construction, fabricated in accordance with approved shop drawings.
- E. Metal Edge:
  - 1. Minimum 24 gauge Kynar 500 pre-finished galvanized steel formed in maximum 10 ft. lengths.
  - 2. Provide expansion slip joints at maximum 10 ft. on center.
- F. Continuous Cleats: 22ga. continuous strips, hot dipped galvanized sheet metal.
- G. Vent Pipe, Heat Vent Hoods, Sleeves, Pitch Pans, and Accessories: Minimum 24 gauge pre-finished, or hot-dip grip galvanized steel.
- H. Gutters, Downspouts and Scupper Sleeves: Minimum 24 gauge Kynar 500 pre-finished galvanized steel. Lap joints minimum 3 inch. Seal laps with structural sealant and rivet. Coordinate downspouts with steel boots per drawings. Provide expansion joints in gutters per SMACNA guidelines, 50'-0" o.c. max.
  - 1. Downspout Boots shall be fabricated as specified in Section 05 5000 and as detailed on the drawings.
- I. Expansion and Control Joints: 24 gauge hot-dip galvanized steel formed in 10 ft. maximum lengths where possible. Fabricate in accordance with SMACNA reference details, Ref. Plate 5-5a, 5-5b for field installations; Ref. Plates 5-6a & 5-6b for wall conditions.
- J. Vent Stack, Soil Vent, Flashing: 4 pound lead. Fabricate and install in accordance with approved shop drawings.
- K. Vent Pipe Flashing: 24 gauge hot-dip galvanized steel.
- L. Roof Drain Flashing: 2.5 pound lead sheet, minimum 36" x 36" square. Fabricate and install as shown in NRCA Roofing and Waterproofing Manual.
- M. Elastic Expansion Joint Fabrication: Manufacturer's standard units of size and type indicated, complete with pre-fabricated corner and intersection units and splicing materials; with elastic sheet flashing forming primary joint membrane, in supported bellows arrangement to be secured to both sides of expansion joints; with bellow insulated from below with adhesively applied, flexible, closed-cell rubber or plastic not less than 3/8" thick.
  - 1. Type: Encapsulated metal flanged edges, for embedment in other construction or nailing to substrates, 4" minimum flange width.
  - 2. Type: Metal flanged edges, 3" to 4" wide, formed to profiles as indicated to fit curbs, for nailing to substrate.
    - a. Metal Flanges: 0.0179 inch (26 gauge) zinc-coated steel.
    - b. Looped Bellows Width: 5 inches to 6 inches, exclusive of flanges.

- N. Pitch Pans: 24 gauge hot-dip galvanized steel. Fabricate with ¼ inch hem at top edge and with 4 inch flanges. Fabricate to provide installed minimum clear inside perimeter dimension of 2 inches on each side or a minimum size of 6" x 6".

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.

#### **3.02 PREPARATION**

- A. Install starter and edge strips, and cleats before starting installation.
- B. Install surface mounted reglets true to lines and levels, and seal top of reglets with sealant.
- C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

#### **3.03 INSTALLATION**

- A. Install sheet metal with lines, arises, and angles sharp and true, and plane surfaces free from objectionable wave, warp, or buckle. Exposed edges of sheet metal shall be folded back to form ¼ inch hem on concealed side from view. Finished work shall be free from water retention and leakage under all weather conditions. Pre-fabricated corners or transitions are required at changes in direction, elevation, or plane and at intersections. Locate field joints not less than 12 inches, nor more than 3 feet from actual corner. Laps shall be 1 inch, riveted and soldered at following locations: Prefabricated corners; transitions; changes in direction, elevation, and plane; and at intersections.
- B. Anchor units of work securely in place to prevent damage or distortion from wind or buckling. Provide for thermal expansion of metal units; conceal fasteners where possible; and set units true to line and level as indicated. Install work with laps, joints and seams which are permanently watertight and weather proof.
- C. Install fabricated sheet metal items in accordance with manufacturer's installation instructions and recommendations and with SMACNA Architectural Sheet Metal Manual.
- D. Separations: Provide for separation of metal from non-compatible metal or corrosive substrates by coating concealed surfaces with zinc chromate, bituminous coating, or other permanent separation at locations or contact as recommended by manufacturer or fabricator. Do not use materials incompatible with roofing system.
- E. Continuous Cleat: At exposed edges of gravel guards, fascias, coping cap and metal edge gravel guard and where required otherwise, attach galvanized continuous cleat nailed staggered at six (6) inches on center. Nails shall be annular threaded galvanized nails, with a minimum of 1.5 inches in length, and seated on the vertical flange of the cleat. Cleat shall be one gauge heavier than adjacent sheet metal item or a minimum of 22 gauge.
- F. Flanges: Bed flanges of work in thick coat of bituminous roofing cement where required for waterproof performance.
- G. Coping: Minimum 24 gauge pre-finished galvanized steel.
- H. Coping Cap Flashings
1. Install over underlayment and slip sheet.
  2. Lock bottom flanges to edge strips.
  3. Join sheets in accordance with SMACNA details.
  4. Fasten back of coping with fasteners and neoprene washers 8 inches on center through pre-drilled slotted holes.
- I. Flashings and Counterflashings
1. Extend flanges into reglet and securely fasten.

2. Where nailing is required, nail at 6 inches on center.
  3. Overlap 4 inches on base flashing; lap ends at 3 inches.
  4. Or, depending on other construction, install counterflashing in reglets, either by snap in seal arrangement or by wedging in place with lead wedges at 8 inches on center for anchorage and filling reglet with elastomeric sealant as indicated and as required for specific exposure.
  5. All sheet metal counterflashing shall include a galvanized hook strip, placed a minimum of three feet on center or as required by local code or wind uplift requirement.
- J. Metal Edge
1. Install with allowance for movement between sections and seal with six (6) inch minimum cover plates.
  2. Extend flanges 4 inches onto roof surface.
  3. Install sealant between flange and substrate.
  4. Fasten 3 inches on center in two staggered rows.
- K. Roof Penetration Hoods and Umbrella Counterflashings
1. Install watertight hood or umbrella counterflashing at sleeves and penetration locations, such as pipes and conduit penetration roof, and at equipment supports and over pitch pans.
  2. Set umbrella counterflashing in sealant.
  3. Fully solder connections and seams and install in accordance with approved shop drawings.
  4. Tighten draw bands.
  5. Seal top of umbrella counterflashing with sealant.
- L. Reglets
1. Install reglets to receive counterflashing in manner and by methods indicated.
  2. Where shown in concrete, furnish reglets to trades of concrete work for installation as part of work in Division 3 Sections.
  3. Where shown in masonry, furnish reglets to trades of masonry work for installation as part of work in Division 4 Sections.
- M. Elastic Flashing
1. Install elastic sheet flashing in accordance with manufacturer's recommendations and procedures.
  2. Where required, provide for movement at joints by forming loops or bellows in width of flashing.
  3. Locate cover or filler strips at joints to facilitate complete drainage of water from flashing.
  4. Seam adjacent flashing sheets with adhesives; seal and anchor edges in accordance with manufacturer's recommendations.
- N. Expansion Joint Flanges
1. Nail flanges of expansion joint units to curb nailers at maximum spacing of 6 inches.
  2. Fabricate seams at joints between units with minimum 3 inches overlap to form continuous waterproof system.
- O. Pitch Pans
1. Fully solder joints and connections.
  2. Height shall be four (4) inches minimum above roofing surface.
  3. Prime and install with flanges set in plastic cement on roof membrane.
  4. Fasten to deck at every three inches with one fastener minimum each side.
  5. Pitch Pan Filler shall be pour grade urethane or modified urethane over cementitious grout as recommended by roofing manufacturer.
  6. Install umbrella counterflashing at every penetration.
- P. Drip Flashing
1. Install over Rosin Paper.
-

2. Furnish drip flashing to trades of masonry work for installation as part of work in specifications, Division 04 Sections.

Q. Rooftop Unit Receiver Trim

1. Install receiver flashing at rooftop units. Receiver clip shall allow RTU to be set on curb prior to roof membrane installation. Refer to drawings for detail.

**3.04 CLEANING**

- A. Remove flux and residual acid immediately by neutralizing with baking soda and washing with clean water. Leave work clean and free of stains, scrap, and debris.
- B. Clean exposed metal surfaces, removing substances which might cause corrosion of metal or deterioration of finishes.
- C. Prime soldered area of phosphatized metal after cleaning to prevent rusting.

**3.05 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - Quality Requirements, for field inspection requirements.
- B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

**END OF SECTION**





**SECTION 07 7200  
ROOF ACCESSORIES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Manufactured curbs and equipment rails.
- B. Equipment rails.
- C. Roof hatches, manual and automatic operation, including smoke vents.
- D. Pipe Stands.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 3100 - Steel Decking.
- B. Section 07 4113 - Metal Roof Panels.
- C. Section 07 5216 - SBS Modified Bituminous Roofing.
- D. Section 07 5400 - Thermoplastic Membrane Roofing.
- E. Section 07 6113 - Standing Seam Sheet Metal Roofing.
- F. Section 07 6200 - Sheet Metal Flashing and Trim: Roof accessory items fabricated from sheet metal.

**1.03 REFERENCE STANDARDS**

- A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2021.
- B. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2021.
- C. FM (AG) - FM Approval Guide Current Edition.
- D. UL (DIR) - Online Certifications Directory Current Edition.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used.
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
  - 4. Maintenance requirements.
  - 5. For smoke hatches, submit evidence of approval by evaluation agency specified.
- C. Certificate: For smoke hatches, provide certificate of approval from authority having jurisdiction.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Remove protective wrapping immediately after installation.
- C. Store products under cover and elevated above grade.
- D. The contractor shall thoroughly inspect product upon receipt and report damaged material immediately to delivering carrier and note such damage on the carrier's freight bill of lading.

**1.06 WARRANTY**

- A. Comply with requirements of Section 01 7800 – Closeout Submittals.
- B. Submit a written warranty, executed by the Contractor, Installer, and Manufacturer, agreeing to repair or replace roof accessories that fail in materials or workmanship within the specified warranty period.

1. Roof Scuttle Warranty Period: Five (5) years after date of Substantial Completion.
2. Automatic Smoke/Fire Vent Warranty Period: Five (5) years after date of Substantial Completion.
3. Roof Pipe Stands Warranty Period: One (1) year after date of Substantial Completion.

## **PART 2 PRODUCTS**

### **2.01 ROOF CURBS**

- A. Manufacturers:
  1. Thybar Corporation: [www.thybar.com](http://www.thybar.com).
  2. Substitutions: See Section 01 6000 - Product Requirements.
- B. Roof Curbs Mounting Assemblies: Factory fabricated hollow sheet metal construction, internally reinforced, and capable of supporting superimposed live and dead loads and designated equipment load with fully mitered and sealed corner joints welded or mechanically fastened, and integral counterflashing with top and edges formed to shed water.
  1. Roof Curb Mounting Substrate: Curb substrate consists of standing seam metal roof panel system.
  2. Sheet Metal Material:
    - a. Aluminum: 0.080 inch minimum thickness, with 3003 alloy, and H14 temper.
  3. Galvanized Steel: Hot-dip zinc coated steel sheet complying with ASTM A653/A653M, SS Grade 33; G60 coating designation; 18 gage, 0.048 inch thick.
  4. Fabricate curb bottom and mounting flanges for installation directly on metal roof panel system to match slope and configuration of system.
    - a. Extend side flange to next adjacent roof panel seam and comply with seam configurations and seal connection, providing at least 6 inch clearance between curb and metal roof panel flange allowing water to properly flow past curb.
    - b. Where side of curb aligns with metal roof panel flange, attach fasteners on upper slope of flange to curb connection allowing water to flow past below fasteners, and seal connection.
    - c. Maintain at least 12 inch clearance from curb, and lap upper curb flange on underside of down sloping metal roof panel, and seal connection.
    - d. Lap lower curb flange overtop of down sloping metal roof panel and seal connection.
  5. Provide layouts and configurations indicated on drawings.
  6. Curb shall be sized to allow space for flashing. Reference drawings for flashing detail. Roof curb shall allow for units to be set prior to roof material completion. Coordinate curb size with Mechanical drawings.
- C. Curbs Adjacent to Roof Openings: Provide curb on each side of opening, with top of curb horizontal for equipment mounting.
  1. Provide preservative treated wood nailers along top of curb.
  2. Insulate inside curbs with 1-1/2 inch thick fiberglass insulation.
  3. Height Above Roof Deck: 18 inches, minimum.
  4. Model TC-2 for equipment support curbs.
  5. Model TC-3 for roof curbs.
- D. Equipment Rail Curbs: Straight curbs on each side of equipment, with top of curbs horizontal and level with each other for equipment mounting.
  1. Equipment supports shall span a minimum of two structural members.
  2. Model TEMS-3 for equipment rails

### **2.02 ROOF HATCHES, MANUAL AND AUTOMATIC OPERATION**

- A. Roof Hatch Manufacturers:
  1. Babcock-Davis: [www.babcockdavis.com/sle](http://www.babcockdavis.com/sle).
  2. Bilco Company: [www.bilco.com/sle](http://www.bilco.com/sle).
  3. Elmdor Stonemen: [www.elmdorstoneman.com/#sle](http://www.elmdorstoneman.com/#sle).
  4. Milcor, Inc: [www.milcorinc.com](http://www.milcorinc.com).

5. Nystrom, Inc: [www.nystrom.com/#sle](http://www.nystrom.com/#sle).
  6. Substitutions: See Section 01 6000 - Product Requirements.
- B. Roof Hatches and Smoke Vents: Factory-assembled, painted galvanized steel frame and cover, complete with operating and release hardware.
1. Style: Provide flat metal covers unless otherwise indicated.
    - a. Basis of Design: Bilco Scuttle Type S, size width: 3'-0" x length: 2'-6". Length denotes hinge side. The roof scuttle shall be single leaf. The roof scuttle shall be pre-assembled from the manufacturer.
  2. Mounting: Provide frames and curbs suitable for mounting conditions as indicated on drawings.
- C. Smoke and Heat Vents: Where "smoke" or "smoke/heat" operation is indicated, provide following additional features and omit manual operation for access.
1. Basis of Design: Bilco Fire vent Type DSH, size: width (60") x length (120"). Length denotes hinge side. The roof fire vent shall be double leaf. The roof fire vent shall be preassembled from the manufacturer.
  2. Smoke Release Mechanism: Automatic opening on melting of replaceable UL (DIR) listed fusible link at 165 deg F.
  3. UL (DIR) or FM (AG) listed as automatically operated smoke and heat vent.
- D. Frames and Curbs: One-piece curb and frame with integral cap flashing to receive roof flashings; extended bottom flange to suit mounting.
1. Insulation: Manufacturer's standard; 1 inch rigid glass fiber, located on outside face of curb.
  2. Curb Height: 12 inches from finished surface of roof, minimum.
- E. Metal Covers: Flush, insulated, hollow metal construction.
1. Capable of supporting 40 psf live load.
  2. Insulation: Manufacturer's standard 1 inch rigid glass fiber.
  3. Gasket: EPDM, continuous around cover perimeter.
  4. Entire scuttle shall be weather tight with fully welded corner joints on cover and curb.
- F. Safety Railing System: Manufacturer's standard accessory safety rail system mounted directly to curb. Provide where hatch is located within 10' of the roof edge or as required by OSHA standards.
1. Comply with 29 CFR 1910.23, with a safety factor of two.
  2. Posts and Rails: Fiberglass reinforced polymer.
  3. Gate: Same material as railing; automatic closing with latch.
  4. Finish: Manufacturer's standard; molded in integral safety yellow.
  5. Gate Hinges and Post Guides: ASTM B221 (ASTM B221M), 6063 alloy, T5 temper aluminum.
  6. Mounting Brackets: Hot dipped galvanized steel, 1/4 inch thick, minimum.
  7. Fasteners: Stainless steel, Type 316.
- G. Hardware: Steel, zinc coated and chromate sealed, unless otherwise indicated or required by manufacturer.
1. Lifting Mechanisms: Compression spring operator with shock absorbers that automatically opens upon release of latch; capable of lifting covers despite 10 psf load.
  2. Hinges: Heavy duty pintle type.
  3. Hold open arm with vinyl-coated handle for manual release.
  4. Latch: Upon closing, engage latch automatically and reset manual release.
  5. Manual Release: Pull handle on interior.
  6. Smoke Hatches: Manual release operation not to disturb automatic release mechanisms; easy resetting by Owner's maintenance personnel; provide latch designed to prevent relatching unless automatic release mechanism has been properly reset for automatic operation.
  7. Locking: Padlock hasp on interior.

## **2.03 PIPE STANDS**

- A. Acceptable Manufacturers: Subject to compliance with requirements herein, provide products from one of the following manufacturers.
  - 1. Miro Industries, Inc.: [www.miroind.com](http://www.miroind.com)
  - 2. MAPA Products: [www.mapaproducts.com](http://www.mapaproducts.com)
  - 3. Substitutions: See Section 01 6000 - Product Requirements.
- B. Gas Piping
  - 1. Provide a "roller-bearing" pipe support used to support roof-mounted gas piping. Pipes rest on a self-lubricating roller system which is made of a stainless steel rod and a sturdy polycarbonate resin roller. The pipe support base is made of polycarbonate resin, the roller rod is made of glass-filled nylon, and all metal parts are made of stainless steel. Pipe stand will accommodate up to 4" pipe (inside diameter) up to 5" outside diameter pipes. Pipes shall be supported at a minimum distance of 6" off of the roof deck.
  - 2. Product Requirements
    - a. Load Weight: Maximum load weight may not exceed 125 lbs. per pipestand.
    - b. Model Number: 4-RAH – Miro Industries
    - c. Size: Base - 9" x 15.12", with adjustment from 2.75" to 7.0" above roof membrane.
    - d. Spacing: Not to exceed ten (10) foot centers.
- C. Condensate Piping
  - 1. Provide a threaded rod "clamp" pipe support used to support roof-mounted condensate piping. Pipes are stabilized by a rubber cushion provides vibration isolator. System is made of a stainless steel rod and pipe clamp. The pipe support base is made of Molded 33% Fiberglass Reinforced 6/6 nylon. Support pad is .125 ml black Neoprene.
  - 2. Pipe stand will accommodate up to 2" copper pipe. Pipes shall be supported at a minimum distance of 6" off of the roof deck.
  - 3. Product Requirements
    - a. Load Weight: Maximum load weight may not exceed 75 lbs. per pipestand.
    - b. Model Number: MS-1 – MAPA Products
    - c. Threaded rod: 3/8" - Grade 304 SS ATR
    - d. Size: Base – 8" Octagonal, with an adjustment from 6" to 10" above roof membrane.
    - e. Spacing: Not to exceed ten (10) foot centers.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### **3.02 PREPARATION**

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using methods recommended by manufacturer for achieving acceptable results for applicable substrate under project conditions.

### **3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions, in manner that maintains roofing system weather-tight integrity.
- B. Pipe Stands
  - 1. Pipe stand shall be adjusted in height to distribute load evenly.
  - 2. Provide an additional sheet of roofing material under all pipe stands.
  - 3. All loose aggregate shall be removed from the area directly beneath the pipe stand.

**3.04 CLEANING**

- A. Clean installed work to like-new condition.

**3.05 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

**END OF SECTION**



**SECTION 07 8100  
APPLIED FIRE PROTECTION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Fireproofing of interior structural steel not exposed to damage or moisture.
- B. Preparation of fireproofing for application of exposed finish specified elsewhere.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 1400 - Work Restrictions
- B. Section 01 4533 - Code-Required Quality Control
- C. Section 05 1200 - Structural Steel Framing.
- D. Section 05 2100 - Steel Joist Framing.
- E. Section 05 3100 - Steel Decking.
- F. Section 07 8400 - Firestopping.

**1.03 REFERENCE STANDARDS**

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023b.
- B. ASTM E605/E605M - Standard Test Methods for Thickness and Density of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members 2019 (Reapproved 2023).
- C. ASTM E736/E736M - Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members 2019 (Reapproved 2023).
- D. ASTM E759/E759M - Standard Test Method for Effect of Deflection on Sprayed Fire-Resistive Material Applied to Structural Members 1992 (Reapproved 2023).
- E. ASTM E760/E760M - Standard Test Method for Effect of Impact on Bonding of Sprayed Fire-Resistive Material Applied to Structural Members 1992 (Reapproved 2023).
- F. ASTM E859/E859M - Standard Test Method for Air Erosion of Sprayed Fire-Resistive Materials (SFRMs) Applied to Structural Members 2023.
- G. ASTM E937/E937M - Standard Test Method for Corrosion of Steel by Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members 1993 (Reapproved 2023).

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate with placement of ceiling hanger tabs, mechanical component hangers, and electrical components.
- B. Preinstallation Meeting: Convene two before starting work of this section.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittals procedures.
- B. Product Data: Provide data indicating product characteristics, performance criteria, and limitations of use.
- C. Test Reports: Reports from reputable independent testing agencies for proposed products, indicating compliance with specified criteria, conducted under conditions similar to those on project, as follows:
  - 1. Bond strength.
  - 2. Bond impact.
  - 3. Compressive strength.
  - 4. Fire tests using substrate materials similar those on project.
- D. Manufacturer's Installation Instructions: Indicate special procedures.

- E. Manufacturer Reports: Indicate environmental conditions that applied fireproofing materials were installed.

#### **1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience
  - 1. Having minimum five years of documented experience.

#### **1.07 MOCK-UP**

- A. Construct mock-up, 100 square feet in size.
- B. Comply with project requirements for fire ratings, thickness, density of application, and code compliance.
- C. Locate where directed.
- D. Examine installation within one hour of application to determine variances from specified requirements due to shrinkage, temperature, and humidity.
- E. Where shrinkage and cracking are evident, adjust mixture and method of application as necessary; remove materials and re-construct mock-up.
- F. Mock-up may remain as part of the Work.

#### **1.08 FIELD CONDITIONS**

- A. Do not apply fireproofing when temperature of substrate material and surrounding air is below 40 degrees F or when temperature is predicted to be below said temperature for 24 hours after application.
- B. Provide ventilation in areas to receive fireproofing during application and 24 hours afterward, to dry applied material.
- C. Provide temporary enclosure to prevent spray from contaminating air.
- D. Do not allow roof traffic during installation of roof fireproofing and drying period.

#### **1.09 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a two year period after Date of Substantial Completion.
  - 1. Include coverage for fireproofing to remain free from cracking, checking, dusting, flaking, spalling, separation, and blistering.
  - 2. Reinstall or repair failures that occur within warranty period.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Applied Fireproofing:
  - 1. Carbolite Company: [www.carbolite.com](http://www.carbolite.com).
  - 2. GCP Applied Technologies: [www.gcpat.com/fireproofing](http://www.gcpat.com/fireproofing).
  - 3. Isolatek International Corp: [www.isolatek.com](http://www.isolatek.com).
  - 4. Substitutions: See Section 01 6000 - Product Requirements.

#### **2.02 FIREPROOFING ASSEMBLIES**

- A. Provide assemblies as indicated on drawings.

#### **2.03 MATERIALS**

- A. Sprayed Fire-Resistive Material for Interior Applications, Concealed: Manufacturer's standard factory mixed material, which when combined with water is capable of providing the indicated fire resistance, and conforming to the following requirements:



1. Bond Strength: 150 pounds per square foot, minimum, when tested in accordance with ASTM E736/E736M when set and dry.
2. Dry Density: Minimum average density of 15 lb/cu ft, with minimum individual density of any test sample of 14 lb/cu ft, when tested in accordance with ASTM E605/E605M.
3. Compressive Strength: 8.33 pounds per square inch, minimum.
4. Effect of Impact on Bonding: No cracking, spalling or delamination, when tested in accordance with ASTM E760/E760M.
5. Corrosivity: No evidence of corrosion, when tested in accordance with ASTM E937/E937M.
6. Air Erosion Resistance: Weight loss of 0.025 g/sq ft, maximum, when tested in accordance with ASTM E859/E859M after 24 hours.
7. Surface Burning Characteristics: Maximum flame spread index of 0 (zero) and maximum smoke developed index of 0 (zero), when tested in accordance with ASTM E84.
8. Effect of Deflection: No cracking, spalling, or delamination, when tested in accordance with ASTM E759/E759M.

## **2.04 ACCESSORIES**

- A. Primer Adhesive: Of type recommended by applied fireproofing manufacturer.
- B. Overcoat: As recommended by manufacturer of applied fireproofing material.
- C. Metal Lath: Expanded metal lath; minimum 3.4 pounds per square foot, galvanized finish.
- D. Water: Clean, potable.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that surfaces are ready to receive fireproofing.
- B. Verify that clips, hangers, supports, sleeves, and other items required to penetrate fireproofing are in place.
- C. Verify that ducts, piping, equipment, or other items that would interfere with application of fireproofing have not been installed.
- D. Verify that voids and cracks in substrate have been filled.
- E. Verify that projections have been removed where fireproofing will be exposed to view as a finish material.

### **3.02 PREPARATION**

- A. Perform tests as recommended by fireproofing manufacturer in applications where adhesion of fireproofing to substrate is in question.
- B. Remove incompatible materials that could effect bond by scraping, brushing, scrubbing, or sandblasting.
- C. Prepare substrates to receive fireproofing in strict accordance with instructions of fireproofing manufacturer.
- D. Apply fireproofing manufacturer's recommended bonding agent on primed steel.
- E. Protect surfaces not scheduled for fireproofing and equipment from damage by overspray, fall-out, and dusting.
- F. Close off and seal duct work in areas where fireproofing is being applied.

### **3.03 APPLICATION**

- A. Install metal lath over structural members as indicated or as required by UL Assembly Design Numbers.
- B. Apply primer coating, fireproofing, and overcoat in accordance with manufacturer's instructions.
- C. Apply fireproofing in uniform thickness and density as necessary to achieve required ratings.

- D. In exposed locations, trowel surface smooth and form square edges, using tools and procedures recommended by fireproofing manufacturer.
- E. Apply overcoat at the rate recommended by fireproofing manufacturer.

**3.04 FIELD QUALITY CONTROL**

- A. Perform field inspection and testing in accordance with Section 01 4000 - Quality Requirements.
- B. The owner will employ an independent agency to randomly sample and verify the thickness and the density of the fireproofing in accordance with the provisions of ASTM E605 and verify the bond strength of the fireproofing in accordance with ASTM E736.
- C. Inspect installed fireproofing after application and curing for integrity, prior to its concealment.
- D. Ensure that actual thicknesses, densities, and bond strengths meet requirements for specified ratings and requirements of authorities having jurisdiction (AHJ).
- E. Re-inspect installed fireproofing for integrity of fire protection, after installation of subsequent Work.

**3.05 CLEANING**

- A. Remove excess material, overspray, droppings, and debris.
- B. Remove fireproofing from materials and surfaces not required to be fireproofed.
- C. At exposed fireproofing, clean surfaces that have become soiled or stained, using manufacturer's recommended procedures.

**END OF SECTION**

**SECTION 07 8123**  
**INTUMESCENT FIRE PROTECTION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Thin-film intumescent mastic fireproofing.
- B. Protective and/or decorative topcoats.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 1400 - Work Restrictions
- B. Section 01 4533 - Code-Required Quality Control
- C. Section 05 1200 - Structural Steel Framing.
- D. Section 05 2100 - Steel Joist Framing.
- E. Section 09 9000 - Painting and Coating: Field-applied paints matching intumescent fireproofing.

**1.03 REFERENCE STANDARDS**

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency current edition.
- B. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness 2015 (Reapproved 2021).
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023b.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittals procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Performance characteristics and test results.
  - 2. Preparation instructions and recommendations.
  - 3. Storage and handling requirements and recommendations.
  - 4. Installation methods.
- C. Selection Samples: For decorative top coat, color chips representing manufacturer's full range of available colors and sheens.
- D. Verification Samples: For each thickness, color, sheen, and finish required, submit samples not less than 4 inch square on designated substrate illustrating finished appearance.
- E. Certificates: Certify that intumescent fireproofing provided for this project meets or exceeds specified requirements in all respects.
  - 1. Extrapolation of member size and/or material thickness shown in the individual designs are not acceptable.
- F. Test Reports: Published fire resistive designs for structural elements of the types required for the project, indicating hourly ratings of each assembly.
- G. Field Quality Control Submittals: Submit field test report.
- H. Manufacturer's Qualification Statement.
- I. Installer's Qualification Statement.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company that specializes in manufacturing the type of products specified, with minimum of ten years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified of similar size and scope and with at least five years of documented experience.

- C. Mock-up
  - 1. Provide a mock-up for evaluation of surface preparation techniques and application workmanship; approved mock-up will serve as a standard of comparison for subsequent work of this section.
  - 2. Finish at least 100 sq ft of surface in areas as designated by Architect.
  - 3. Evaluate mock-up for compliance with specified requirements, including thickness and finish texture.
  - 4. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
  - 5. Refinish mock-up area as required to produce acceptable work.
  - 6. Approved mock-up may remain as part of the project.

#### **1.06 PRE-INSTALLATIONS CONFERENCE**

- A. Conduct pre-installation conferences at Project site prior to commencing work.
- B. Attendees:
  - 1. Project Superintendent: presides over meeting and is responsible for minutes.
  - 2. Subcontractor (fireproofing)
  - 3. Manufacturer's technical representative
  - 4. Other directly affecting, or affected by work
  - 5. Testing agency
  - 6. Owner representative
- C. Agenda:
  - 1. Access to work and conditions of proper installation
  - 2. Conditions of installation, such as substrates, existing and surrounding conditions, and environmental conditions,
  - 3. Conditions detrimental to installation
  - 4. Preparation procedures, including protection of adjacent work.
  - 5. Verify installer's receipt and understanding of installation instructions.
  - 6. Review submittals, installation procedures, and sequence.
  - 7. Review coordination with other work.
  - 8. Evaluate delivery schedule and construction progress schedule
  - 9. Observe sample installation
  - 10. Required protection procedures.
  - 11. Observe actual installation areas.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials in manufacturer's original, unopened containers with identification labels and testing agency markings intact and legible.
- B. Store products in manufacturer's unopened packaging until ready for installation.
  - 1. Store at temperatures not less than 50 degrees F in dry, protected area.
  - 2. Protect from freezing, and do not store in direct sunlight.
  - 3. Dispose of any materials that have come into contact with contaminants of any kind prior to application.
- C. Dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

#### **1.08 FIELD CONDITIONS**

- A. Protect areas of application from windblown dust and rain.
- B. Maintain ambient field conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under ambient conditions outside manufacturer's absolute limits.
  - 1. Provide temporary enclosures as required to control ambient conditions.

2. Do not apply intumescent fireproofing when ambient temperatures are below 50 degrees F without specific approval from manufacturer.
3. Maintain relative humidity between 40 and 60 percent in areas of application.
4. Maintain ventilation in enclosed spaces during application and for not less than 72 hours afterward.

#### **1.09 SEQUENCING**

- A. Sequence and coordinate application of intumescent coatings with related work specified in other Sections to comply with the following requirements:
  1. Coordinate installation of intumescent coatings with other items of work that may interfere with proper installation of coatings.
  2. Do not begin applying intumescent coatings until clips, hangers, supports, and other welded connections have been installed. Intumescent coatings manufacturer must approve in writing any clips, hangers, supports or connections that may be installed over coating using mechanical or adhesive devices.
  3. Provide temporary enclosures as necessary to prevent deterioration of intumescent coatings due to exposure to unfavorable environmental conditions as required by installation procedures and product performance capabilities as supplied by manufacturer. Exposure to exterior elements for any portion of construction cycle must be supported by a verified burn test to ensure no degradation of fire properties.
  4. Take appropriate steps to avoid abrasion and other damage to the applied intumescent coatings during construction operations.
  5. Do not protect or conceal structural members to which intumescent coatings have been applied until each area has been inspected, tested, and corrections have been made to any deficient areas.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Intumescent Mastic Fireproofing:
  1. Albi Manufacturing Division of StanChem Inc: [www.albi.com](http://www.albi.com).
  2. Carboline Company: [www.carboline.com](http://www.carboline.com).
  3. Hilti, Inc: [www.us.hilti.com/steel-protection](http://www.us.hilti.com/steel-protection).
  4. Isolatek International Corp: [www.isolatek.com/#s](http://www.isolatek.com/#s)
  5. Sherwin-Williams Company: [www.sherwin-williams.com/#sle](http://www.sherwin-williams.com/#sle).
  6. Substitutions: See Section 01 6000 - Product Requirements.

#### **2.02 SYSTEM REQUIREMENTS**

- A. Fireproofing: Provide intumescent thin-film fire resistive coating systems tested by an independent testing agency in accordance with full scale ASTM E119 and acceptable to authorities having jurisdiction (AHJ).
  1. Provide assemblies listed by UL, ULC, ITS/WH, or FM and bearing listing agency label or mark.
- B. Structural Steel Columns: Fire resistance rating as noted on the drawings.
- C. Structural Steel Beams: Fire resistance rating as noted on the drawings.
- D. Structural Steel Beams and Exposed Steel Deck: Fire resistance rating as noted on the drawings.
- E. Exposed Steel Deck: Fire resistance rating as noted on the drawings.

#### **2.03 MATERIALS**

- A. Fire Resistive Coating System: Thin film intumescent mastic fireproofing system for fire protection of structural steel, concrete, concrete masonry units (CMU), and other items as indicated on the drawings.
  1. Surface Burning Characteristics: Tested in accordance with ASTM E84.
    - a. Flame Spread Index (FSI): 25, maximum.

- b. Smoke Developed Index (SDI): 50, maximum.
- 2. For Interior Use:
  - a. Use only water-based products.
  - b. VOC Content: Less than 50 g per L when tested in accordance with 40 CFR 59, Subpart D (EPA Method 24).
  - c. Durometer Hardness, Type D: 39, minimum, in accordance with ASTM D2240.
- 3. For Exterior Use:
  - a. Use only solvent-based products.
  - b. VOC Content: Less than 125 g per L when tested in accordance with 40 CFR 59, Subpart D (EPA Method 24).
  - c. Durometer Hardness, Type D: 39, minimum, in accordance with ASTM D2240.

#### **2.04 AUXILIARY FIREPROOFING MATERIALS**

- A. General: Provide auxiliary fireproofing materials that are compatible with intumescent coating products and substrates and are approved by UL or other accredited testing agencies acceptable to authorities having jurisdiction for use in the fire resistive designs indicated.
- B. Substrate Primers: For use on each different substrate, provide primer that complies with the following requirements:
  - 1. Primer approved in writing by manufacturer of intumescent coatings and applied in full compliance with the primer manufacturer's recommendations.
  - 2. Primer to have been tested by manufacturer in fire conditions to ensure fire-performance of primer-intumescent system, and adhesion of the post-burn intumescent char to the primer. Documentation of such tests to be provided upon request.
  - 3. Primer must be fully cured prior to installation of the intumescent coating.
- C. Topcoats: Suitable for application over applied intumescent coatings; of type recommended in writing by intumescent coatings manufacturer for each fire resistance design. Topcoat to have been tested by manufacturer for compatibility in fire conditions with documentation of such tests to be provided upon request. Color of topcoat shall be as selected by the architect. Colors shall not be limited to manufacturer's standard colors.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine substrates to determine if they are in satisfactory condition to receive intumescent fireproofing; verify that substrates are clean and free of oil, grease, incompatible primers, or other foreign substances capable of impairing bond to fireproofing system.
- B. Do not begin installation until substrates have been properly prepared.
- C. If substrate preparation is responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

#### **3.02 PREPARATION**

- A. Cover other work subject to damage from fall out or overspray of intumescent coatings materials during application. Provide temporary enclosure as required to confine spraying operations, protect the environment, and ensure maintaining adequate ambient conditions for temperature and ventilation.
- B. Thoroughly clean surfaces to receive fireproofing that could impair bond of fireproofing, including oil, grease, rolling compounds, incompatible primers, rust, and mill scale.
- C. Repair substrates to remove surface imperfections that could effect uniformity of texture and thickness of fireproofing system, and remove minor projections and fill voids that could telegraph through finished work.
- D. Cover or otherwise protect other work that might be damaged by fallout or overspray of fireproofing system, and provide temporary enclosures as necessary to confine operations and maintain required ambient field conditions.

### **3.03 APPLICATION**

- A. Coordinate application of intumescent coatings with other construction to allow for proper application and minimize need to repair damage.
- B. Comply with manufacturer's instructions for particular conditions of installation applications.
- C. Apply manufacturer's recommended primer to required coating thickness. Prime substrates with an approved and compatible primer, unless an approved and compatible shop primer has been applied and is in satisfactory condition to receive intumescent coatings. Primer must be fully cured prior to applying intumescent coatings.
- D. Apply fireproofing to full thickness over entire area of each substrate to be protected.
- E. Apply coats at manufacturer's recommended rate to achieve dry film thickness (DFT) as required for fire resistance ratings designated for each condition. Protect intumescent coatings from rain, direct sunlight, high humidity, strong wind (with dirt, dust or sand) during the application, drying, and curing phases, unless test evidence allows otherwise. Do not apply an additional coat of intumescent coating until previous layer has fully cured.
- F. Apply intumescent fireproofing by spraying to maximum extent possible, and as necessary complete coverage by roller application or other method acceptable to manufacturer.
- G. For applications visible upon completion of project, repair substrates to remove surface imperfections that could affect uniformity of texture and thickness in finished surface of fireproofing. Remove minor projections that would telegraph through fire resistive products after application.
- H. Achieve uniform finished appearance complying with approved mock-up.

### **3.04 FIELD QUALITY CONTROL**

- A. Perform field inspection and testing in accordance with Section 01 4000 - Quality Requirements.
  - 1. Arrange for testing of installed intumescent mastic fireproofing by an independent testing laboratory using magnetic pull-off dry film thickness gage in accordance with SSPC-PA 2, and ensure it meets requirements of authorities having jurisdiction (AHJ).
  - 2. Submit field test reports promptly to Contractor and Architect.
- B. Repair or replace intumescent mastic fireproofing at locations where test results indicate fireproofing does not meet specified requirements.

### **3.05 CLEANING**

- A. Immediately after installation of fireproofing in each area, remove overspray and fallout from other surfaces and clean soiled areas.

### **3.06 PROTECTION**

- A. Protect installed intumescent mastic fireproofing from damage due to subsequent construction activities, so fireproofing is without damage or deterioration before Date of Substantial Completion.
- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

**END OF SECTION**





**SECTION 07 8400  
FIRESTOPPING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Firestopping systems.
- B. Firestopping of all joints and penetrations in fire-resistance rated and smoke-resistant assemblies, whether indicated on drawings or not , and other openings indicated.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 1400 - Work Restrictions
- B. Section 01 4533 - Code-Required Quality Control
- C. Section 01 7000 - Execution and Closeout Requirements: Cutting and patching.
- D. Section 09 2982 - Gypsum Board: Gypsum wallboard fireproofing.

**1.03 REFERENCE STANDARDS**

- A. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials 2022.
- B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems 2023a.
- C. ASTM E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus 2023a.
- D. ITS (DIR) - Directory of Listed Products Current Edition.
- E. FM 4991 - Approval Standard of Firestop Contractors 2013.
- F. FM (AG) - FM Approval Guide Current Edition.
- G. SCAQMD 1168 - Adhesive and Sealant Applications 1989, with Amendment (2022).
- H. UL 1479 - Standard for Fire Tests of Penetration Firestops Current Edition, Including All Revisions.
- I. UL (FRD) - Fire Resistance Directory Current Edition.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.
- C. Product Data: Provide data on product characteristics, performance ratings, and limitations.
- D. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Certificate from authority having jurisdiction indicating approval of materials used.
- G. Installer Qualification: Submit qualification statements for installing mechanics.

**1.05 QUALITY ASSURANCE**

- A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with ASTM E119 and ASTM E814.
  - 1. Listing in UL (FRD), FM (AG), or ITS (DIR) will be considered as constituting an acceptable test report.
  - 2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at [www.icc-es.org](http://www.icc-es.org) will be considered as constituting an acceptable test report.
  - 3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.

- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section and:
  - 1. Approved by Factory Mutual Research Corporation under FM 4991

## **1.06 FIELD CONDITIONS**

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.
- B. Provide ventilation in areas where solvent-cured materials are being installed.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Firestopping Manufacturers:
  - 1. 3M Fire Protection Products: [www.3m.com/firestop/#sle](http://www.3m.com/firestop/#sle).
  - 2. A/D Fire Protection Systems Inc: [www.adfire.com/#sle](http://www.adfire.com/#sle).
  - 3. Everkem Diversified Products, Inc: [www.everkemproducts.com/#sle](http://www.everkemproducts.com/#sle).
  - 4. Hilti, Inc: [www.us.hilti.com/#sle](http://www.us.hilti.com/#sle).
  - 5. Nelson FireStop Products: [www.nelsonfirestop.com/#sle](http://www.nelsonfirestop.com/#sle).
  - 6. Specified Technologies Inc: [www.stifirestop.com/#sle](http://www.stifirestop.com/#sle).
  - 7. Tremco Commercial Sealants & Waterproofing: [www.tremcosealants.com/#sle](http://www.tremcosealants.com/#sle).
  - 8. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 MATERIALS**

- A. Firestopping Materials: Any materials meeting requirements.
- B. Volatile Organic Compound (VOC) Content: Provide products having VOC content lower than that required by SCAQMD 1168.
- C. Mold and Mildew Resistance: Provide firestoppping materials with mold and mildew resistance rating of zero(0) in accordance with ASTM G21.
- D. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.
- E. Fire Ratings: Refer to drawings for required systems and ratings.

### **2.03 FIRESTOPPING ASSEMBLY REQUIREMENTS**

- A. Perimeter Fire Containment Firestopping: Use system that has been tested according to ASTM E2307 to have fire resistance F Rating equal to required fire rating of floor assembly.
- B. Head-of-Wall Joint System Firestopping at Joints Between Fire-Rated Wall Assemblies and Non-Rated Horizontal Assemblies: Use system that has been tested according to ASTM E2837 to have fire resistance F Rating equal to required fire rating of floor or wall, whichever is greater.
- C. Floor-to-Floor, Wall-to-Wall, and Wall-to-Floor Joints, Except Perimeter, Where Both Are Fire-Rated: Use system that has been tested according to ASTM E1966 or UL 2079 to have fire resistance F Rating equal to required fire rating of the assembly in which the joint occurs.
- D. Through Penetration Firestopping: Use system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.

### **2.04 FIRESTOPPING SYSTEMS**

- A. Firestopping: Any material meeting requirements.
  - 1. Fire Ratings: Use system that is listed by FM (AG), ITS (DIR), or UL (FRD) and tested in accordance with ASTM E814, ASTM E119, or UL 1479 with F Rating equal to fire rating of penetrated assembly and minimum T Rating Equal to F Rating and in compliance with other specified requirements.

- B. Sealants or caulking materials for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:
  - 1. Hilti FS-ONE Intumescent Firestop Sealant
  - 2. Hilti CP 604 Self-Leveling Firestop Sealant
  - 3. Hilti CP 620 Fire Foam
  - 4. Hilti CP 606 Flexible Firestop Sealant
  - 5. Hilti CP 601s Elastomeric Firestop Sealant
  - 6. 3M Fire Stop Sealant 2000
  - 7. 3M Fire Barrier CP25 WB
  - 8. Tremco Tremstop Fyre-Sil Sealant
- C. Sealants or caulking materials for use with sheet metal ducts, the following products are acceptable:
  - 1. Hilti CP 601s Elastomeric Firestop Sealant
  - 2. Hilti CP 606 Flexible Firestop Sealant
  - 3. Hilti FS-ONE Intumescent Firestop Sealant
- D. Sealants, caulking or spray materials for use with fire-rated construction joints and other gaps, the following products are acceptable:
  - 1. Hilti CFS-SP WB Firestop Joint Spray
  - 2. Hilti CP 601s Elastomeric Firestop Sealant
  - 3. Hilti CP 606 Flexible Firestop Sealant
  - 4. Hilti CP 604 Self-Leveling Firestop Sealant
  - 5. 3M Firestop Sealant 2000
  - 6. Tremco Tremstop Fyre-Sil Sealant
- E. Intumescent sealants or caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:
  - 1. Hilti FS-ONE Intumescent Firestop Sealant
  - 2. 3M Fire Barrier CP25 WB
  - 3. Tremco Tremstop WBM Intumescent Firestop Sealant
- F. Intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles, the following products are acceptable:
  - 1. Hilti FS-ONE Intumescent Firestop Sealant
  - 2. Hilti CP 618 Firestop Putty Stick
  - 3. 3M Fire Barrier CP25 WB
  - 4. Tremco Tremstop WBM Intumescent Firestop Sealant
- G. Intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles, the following products are acceptable:
  - 1. Hilti FS-ONE Intumescent Firestop Sealant
  - 2. Hilti CP 618 Firestop Putty Stick
  - 3. 3M Fire Barrier CP25 WB
  - 4. Tremco Tremstop WBM Intumescent Firestop Sealant
- H. Non curing, re-penetrable intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles, the following products are acceptable:
  - 1. Hilti CP 618 Firestop Putty Stick
- I. Non curing, re-penetrable intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles, the following products are acceptable:
  - 1. Hilti CP 618 Firestop Putty Stick
- J. Wall opening protective materials for use with UL listed metallic and specified nonmetallic outlet boxes, the following products are acceptable:

1. Hilti CP 617 Firestop Putty Pad
- K. Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems), the following products are acceptable:
  1. Hilti CP 642 Firestop Collar
  2. Hilti CP 643 Firestop Collar
  3. Hilti CP 645 Firestop Wrap Strip
  4. 3M Fire Barrier PPD Plastic Pipe Device
- L. Cast-in place firestop devices for use with non-combustible and combustible plastic pipe (closed and open piping systems) penetrating concrete floors, the following products are acceptable:
  1. Hilti CP 680 Cast-In Place Firestop Device
  2. Hilti CP 681 Tub Box Kit for use with tub installations
- M. Materials used for large size/complex penetrations made to accommodate multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:
  1. Hilti FS 635 Trowelable Firestop Compound
  2. Hilti FS 657 FIRE BLOCK
  3. Hilti CP 620 Fire Foam
  4. 3M Firestop Foam 2001
  5. 3M Fire Barrier CS-195 Composite Sheet
- N. Cables passing through fire-rated floors or walls shall pass through fire-rated wiring devices which contain an intumescent insert material that adjusts automatically to cable additions or subtractions.
  1. Hilti FS 657 FIRE BLOCK
  2. Specified Technologies Inc., EZ-PATH Fire Rated Pathway
- O. Sealants or caulking materials used for openings between structurally separate sections of wall and floors, the following products are acceptable:
  1. Hilti CP 672 Firestop Spray
  2. Hilti CP 601s Elastomeric Firestop Sealant
  3. Hilti CP 606 Flexible Firestop Sealant
  4. Hilti CP 604 Self-Leveling Firestop Sealant
  5. 3M Fire Barrier CP 25 WB

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify openings are ready to receive the work of this section.

#### **3.02 PREPARATION**

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.
- B. Remove incompatible materials that could adversely affect bond.
- C. Install backing materials to prevent liquid material from leakage.

#### **3.03 INSTALLATION**

- A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
- B. Do not cover installed firestopping until inspected by authorities having jurisdiction.
- C. Install labeling required by code.

#### **3.04 FIELD QUALITY CONTROL**

- A. A Special Inspection and Testing Agency (SITA) will perform field quality control tests and inspections, as specified in Sections 01 4516 and 01 4533.

- B. Repair or replace penetration firestopping and joints at locations where inspection results indicate firestopping or joints do not meet specified requirements.

**3.05 CLEANING**

- A. Clean adjacent surfaces of firestopping materials.

**3.06 PROTECTION**

- A. Protect adjacent surfaces from damage by material installation.

**END OF SECTION**



**SECTION 07 9200  
JOINT SEALANTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Self-leveling pourable joint sealants.
- B. Joint backings and accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 4000 – Quality Requirements
- B. Section 03 3000 – Cast-In-Place Concrete
- C. Section 04 2000 – Unit Masonry
- D. Section 07 6200 – Sheet Metal Flashing and Trim

**1.03 REFERENCE STANDARDS**

- A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer 2015 (Reapproved 2022).
- B. ASTM C834 - Standard Specification for Latex Sealants 2017 (Reapproved 2023).
- C. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications 2022.
- D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.
- E. ASTM C1193 - Standard Guide for Use of Joint Sealants 2016 (Reapproved 2023).
- F. ASTM C1311 - Standard Specification for Solvent Release Sealants 2022.
- G. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants 2023.
- H. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints 2019 (Reapproved 2020).
- I. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness 2015 (Reapproved 2021).
- J. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension 2016 (Reapproved 2021).

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit manufacturer's technical datasheets for each product to be used; include the following:
  - 1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
  - 2. List of backing materials approved for use with the specific product.
  - 3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
  - 4. Substrates the product should not be used on.
  - 5. Substrates for which use of primer is required.
- C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
- D. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
- E. Samples for Verification: Where custom sealant color is specified, obtain directions from Architect and submit at least two physical samples for verification of color of each required sealant.

- F. Executed warranty.
- G. Submit Material Safety Data Sheets under provisions of Section 01 7800 – Closeout Submittals for the following items:
  - 1. All mastics, glues, and adhesives
  - 2. Sealant (interior use only)

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten (10) years experience.
- B. Installer Qualifications: Company specializing in performing the work of this section and with at least five (5) years of experience.
- C. Field Adhesion Tests of Joints: Test for adhesion using most appropriate method in accordance with ASTM C1521, or another applicable method as recommended by manufacturer.
  - 1. All joint sealants shall be field tested for proper adhesion to the joint substrates prior to installation. Do not proceed with the work until job site tests have been approved by the Architect.
  - 2. Locate and provide test joints for each type of joint sealant, and substrate as directed by the Architect.
  - 3. Acceptable test joints will be used as the standard for all joint sealant work on the project.
    - a. Sealants which fail to adhere to the substrates shall be removed and replaced at no extra cost to the Owner.

#### **1.06 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Installer's Warranty: Correct defective work within a five (5) year period after Date of Substantial Completion.
- C. Manufacturer Warranty:
  - 1. Silicone Exterior Joint Sealants: Twenty (20) years.
  - 2. Polyurethane Exterior Joint Sealants: Minimum five (5) years.
  - 3. All warranties shall include coverage for installed sealants and accessories that fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Nonsag Sealants:
  - 1. Dow Chemical Company: [consumer.dow.com/en-us/industry/ind-building-construction.html/#sle](http://consumer.dow.com/en-us/industry/ind-building-construction.html/#sle).
  - 2. Hilti, Inc: [www.us.hilti.com/#sle](http://www.us.hilti.com/#sle).
  - 3. Master Builders Solutions: [www.master-builders-solutions.com](http://www.master-builders-solutions.com)
  - 4. Momentive Performance Materials, Inc (formerly GE Silicones): [www.momentive.com/#sle](http://www.momentive.com/#sle).
  - 5. Pecora Corporation: [www.pecora.com/#sle](http://www.pecora.com/#sle).
  - 6. Sika Corporation: [www.usa-sika.com/#sle](http://www.usa-sika.com/#sle).
  - 7. Tremco Commercial Sealants & Waterproofing: [www.tremcosealants.com/#sle](http://www.tremcosealants.com/#sle).
  - 8. Substitutions: See Section 01 6000 - Product Requirements.
- B. Self-Leveling Sealants:
  - 1. Dow Chemical Company: [consumer.dow.com/en-us/industry/ind-building-construction.html/#sle](http://consumer.dow.com/en-us/industry/ind-building-construction.html/#sle).
  - 2. Master Builders Solutions: [www.master-builders-solutions.com](http://www.master-builders-solutions.com)
  - 3. Pecora Corporation: [www.pecora.com/#sle](http://www.pecora.com/#sle).
  - 4. Sika Corporation: [www.usa-sika.com/#sle](http://www.usa-sika.com/#sle).



5. Tremco Commercial Sealants & Waterproofing: [www.tremcosealants.com/#sle](http://www.tremcosealants.com/#sle).
6. Substitutions: See Section 01 6000 - Product Requirements.

## 2.02 JOINT SEALANT APPLICATIONS

### A. Scope:

1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to:
  - a. Wall expansion and control joints.
  - b. Joints between door, window, and other frames and adjacent construction.
  - c. Joints between different exposed materials.
  - d. Openings below ledge angles in masonry.
  - e. Other joints indicated below.
2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
  - a. Joints between door, window, and other frames and adjacent construction.
  - b. In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, piping, and other openings; between wall/ceiling and other construction; and other flanking sound paths.
    - 1) Exception: Such gaps and openings in gypsum board and plaster finished stud walls and suspended ceilings.
    - 2) Exception: Through-penetrations in sound-rated assemblies that are also fire-rated.
  - c. Other joints indicated below.
3. Do not seal the following types of joints:
  - a. Intentional weep holes in masonry.
  - b. Joints indicated to be treated with manufactured expansion joint cover, or some other type of sealing device.
  - c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
  - d. Joints where installation of sealant is specified in another section.
  - e. Joints between suspended panel ceilings/grid and walls.

### B. Exterior Joint Sealant Schedule:

1. Joint Type EJS-1: Vertical joints in exterior walls: Silicone, non-sag, non-staining sealant, minimum of Class 50, unless otherwise indicated.
2. Joint Type EJS-2: Lap Joints in Sheet Metal Fabrications: Butyl rubber, non-curing.
3. Joint Type EJS-3: Lap Joints between Manufactured Metal Panels: Butyl rubber, non-curing.
4. Joint Type EJS-4: Control and Expansion Joints in Concrete Paving: Self-leveling polyurethane "traffic-grade" sealant.

### C. Interior Joint Sealant Schedule: Use non-sag polyurethane sealant, unless otherwise indicated. Interior sealants shall be tamper resistant.

1. Joint Type IJS-1: Wall and Ceiling Joints in Non-Wet Areas: Acrylic emulsion latex sealant.
2. Joint Type IJS-2: Wall and Ceiling Joints in Wet Areas: Non-sag polyurethane sealant for continuous liquid immersion.
3. Joint Type IJS-3: Floor Joints in Wet Areas: Non-sag polyurethane " -traffic-grade" sealant suitable for continuous liquid immersion.
4. Joint Type IJS-4: Wall, Ceiling, and Floor Joints Where Tamper-Resistance is Required: Non-sag tamper-resistant polyurethane sealant.
5. Joint Type IJS-5: Joints between Fixtures in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; white.
6. Joint Type IJS-6: In Sound-Rated Assemblies: Acrylic emulsion latex sealant.

- 7. Joint Type IJS-7: Narrow Control Joints in Interior Concrete Slabs: Self-leveling polyurethane sealant.
- 8. Joint Type IJS-8: Other Floor Joints: Self-leveling polyurethane "traffic-grade" sealant.
- D. Interior Wet Areas: Bathrooms, restrooms, kitchens, food service areas, and food processing areas; fixtures in wet areas include plumbing fixtures, food service equipment, countertops, cabinets, and other similar items.
- E. Sound-Rated Assemblies: Walls and ceilings identified as STC-rated, sound-rated, or acoustical.
- F. Areas Where Tamper-Resistance is Required: As indicated on drawings.

### **2.03 SELF-LEVELING JOINT SEALANTS**

- A. Type IJS-7 - Self-Leveling Polyurethane Sealant: ASTM C920, Grade P, Uses M and A; single or multi-component; explicitly approved by manufacturer for traffic exposure; not expected to withstand continuous water immersion .
  - 1. Movement Capability: Plus and minus 25 percent, minimum.
  - 2. Hardness Range: 35 to 55, Shore A, when tested in accordance with ASTM C661.
  - 3. Color: Gray.
  - 4. Service Temperature Range: Minus 40 to 180 degrees F.
- B. Type IJS-8 at horizontal expansion joint locations - Self-Leveling Polyurethane Sealant for Horizontal Expansion Joints: ASTM C920, Grade P, Uses T, M and O; multi-component; explicitly approved by manufacturer for horizontal expansion joints.
  - 1. Movement Capability: Plus and minus 25 percent, minimum.
  - 2. Hardness Range: 30 to 35, Shore A, when tested in accordance with ASTM C661.
  - 3. Color: Limestone.
  - 4. Tensile Strength: 200 to 250 psi in accordance with ASTM D412.
- C. Type EJS-4, IJS-8 - Self-Leveling Polyurethane Sealant for Continuous Water Immersion: Polyurethane; ASTM C920, Grade P, Uses M and A; single or multi-component; explicitly approved by manufacturer for traffic exposure and continuous water immersion.
  - 1. Movement Capability: Plus and minus 25 percent, minimum.
  - 2. Hardness Range: 35 to 55, Shore A, when tested in accordance with ASTM C661.
  - 3. Color: Gray.
  - 4. Service Temperature Range: Minus 40 to 180 degrees F.
- D. Type IJS-6 - High Quality Latex-Based Sound Sealant: ASTM C834, Type OP an opaque sealant, and Grade 0 Degrees C (32 Degrees F) meets requirements for low-temperature flexibility.
  - 1. Color: White.
- E. Type EJS-4 locations as applicable - Semi-Self-Leveling Polyurethane Sealant: Intended for expansion joints in sidewalks, swimming pool decks, plazas, floors and other horizontal surfaces with up to 6 percent slope.
  - 1. Composition: Single or multicomponent.
  - 2. Durometer Hardness, Type A: 35 to 45, minimum, when tested in accordance with ASTM D2240.
  - 3. Color: Match adjacent finished surfaces.

### **2.04 ACCESSORIES**

- A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
  - 1. Horizontal: ASTM C1330; Type C - Closed Cell Polyethylene.
  - 2. Vertical: ASTM C1330; Type B - Bi-Cellular Polyethylene.
  - 3. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.

- B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.
- C. Masking Tape: Self-adhesive, nonabsorbent, nonstaining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.
- D. Joint Cleaner: Noncorrosive and nonstaining type, type recommended by sealant manufacturer; compatible with joint forming materials.
- E. Primers: Type recommended by sealant manufacturer to suit application; nonstaining.
- F. Flexible Polyurethane Foam: Single-component, gun grade, and low-expanding.
  - 1. Color: White.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.

### **3.02 PREPARATION**

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.
- E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in an inconspicuous area to verify that it does not stain or discolor slab.

### **3.03 INSTALLATION**

- A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Provide joint sealant installations complying with ASTM C1193.
- C. Install acoustical sealant application work in accordance with ASTM C919.
- D. Measure joint dimensions and size joint backers to achieve the following, unless otherwise indicated:
  - 1. Width/depth ratio of 2:1.
  - 2. Neck dimension no greater than 1/3 of the joint width.
  - 3. Surface bond area on each side not less than 75 percent of joint width.
- E. Install bond breaker backing tape where backer rod cannot be used.
- F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
- G. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
- H. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.
- I. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

**END OF SECTION**



**SECTION 07 9513**  
**EXPANSION JOINT COVER ASSEMBLIES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Expansion joint cover assemblies for floor, wall, ceiling, and soffit surfaces.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 1000 - Concrete Forming and Accessories: Placement of joint cover assembly frames in formwork.
- B. Section 04 2000 - Unit Masonry: Placement of joint cover assembly frames in masonry.

**1.03 REFERENCE STANDARDS**

- A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2020.
- B. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2013.
- C. ASTM B308/B308M - Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles 2020.
- D. ITS (DIR) - Directory of Listed Products current edition.
- E. UL (DIR) - Online Certifications Directory Current Edition.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Installation Templates: For frames and anchors to be embedded in concrete or masonry, furnish templates to relevant installers; include installation instructions and tolerances.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide joint assembly profiles, profile dimensions, anchorage devices and available colors and finish.
- C. Shop Drawings: Indicate joint and splice locations, miters, layout of the work, effected adjacent construction and anchorage locations.
- D. Samples: Submit two samples six inch long, illustrating profile, dimension, color, and finish selected of each specified product.
- E. Manufacturer's Installation Instructions: Indicate rough-in sizes and required tolerances for item placement.
- F. Submit Material Safety Data Sheets under provisions of Section 01 7800 – Closeout Submittals for the following items:
  - 1. All mastics, glues, and adhesives
  - 2. Thermal insulation (excluding fiberglass, foam, rubber)
  - 3. Fireproofing
  - 4. Sealant (interior use only)
- G. Certificates - Material test reports from qualified independent testing laboratory indicating and interpreting test results relative to compliance of fire-rated expansion joint assemblies with requirements indicated.

**1.06 QUALITY ASSURANCE**

- A. Materials and work shall conform to the latest edition of reference specifications specified herein and to all applicable codes and requirements of local authorities having jurisdiction.
- B. Fire Performance Characteristics - Where indicated, provide expansion joint cover assemblies identical to those of assemblies whose fire resistance has been determined per ANSI/UL 263, NFPA 251, U.B.C. 43-1, or rated period by Underwriters Laboratories, Inc.

1. Fire Rating - Not less than the rating of adjacent construction.
- C. Loading Characteristics - Standard floor covers should be designed to withstand a maximum point load of 500 lbs. without damage or permanent deformation. Heavy-duty covers should withstand a point load of 2,000 lbs.
- D. Single-Source Responsibility - Obtain expansion joint cover assemblies from one source from a single manufacturer.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Expansion Joint Cover Assemblies:
  1. Balco; a CSW Industrials Company: [www.balcousa.com](http://www.balcousa.com)
  2. Construction Specialties, Inc: [www.c-sgroup.com](http://www.c-sgroup.com).
  3. EMSEAL Joint Systems, Ltd: [www.emseal.com/#sle](http://www.emseal.com/#sle).
  4. Inpro: [www.inprocorp.com/#sle](http://www.inprocorp.com/#sle).
  5. MM Systems Corp: [www.mmsystemscorp.com](http://www.mmsystemscorp.com).
  6. Nystrom, Inc: [www.nystrom.com](http://www.nystrom.com).
  7. Watson Bowman Acme Corp.: [www.watsonbowmanacme.com](http://www.watsonbowmanacme.com).
  8. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 EXPANSION JOINT COVER ASSEMBLY APPLICATIONS**

- A. Floor Joints at all types of Floor Finish :
  1. C-S Group; Model GFT-100 X 2 Floor to Floor Transition
  2. C-S Group; Model GFTW-100 X 2 Floor to Wall Transition
  3. C-S Group; Model PC-100 Floor to Floor Plate Cover
- B. Floor Joints at all types of Floor Finish at existing concrete floor slab locations:
  1. C-S Group; Model GFPS-100 Floor to Floor Transition
  2. C-S Group; Model GFPSW-100 Floor to Wall Transition
- C. Wall Joints at all types of Walls, Surface Mounted:
  1. C-S Group; Model ASM-100 Flat
  2. C-S Group; Model ASMC-100 Corner Transition
- D. Ceiling Joints at Suspended Acoustic Ceiling Finish:
  1. C-S group; Model HC-100 Flat
  2. C-S Group; Model HCW-100 Wall to Ceiling Transition
- E. Ceiling Joints at Gypsum Board Ceiling Finish:
  1. C-S Group; Model FWF-100 Flat
  2. C-S Group; Model FWFC-100 Wall to Ceiling Transition
- F. Interior/Exterior Fire-Rated Wall Joints Subject to Thermal Movement:
  1. Manufacturers:
    - a. EMSEAL Joint Systems, Ltd; Emshield WFR2 System: [www.emseal.com/#sle](http://www.emseal.com/#sle).
    - b. Substitutions: See Section 01 6000 - Product Requirements.
- G. Exterior Wall Joints Subject to Thermal Movement:
  1. Manufacturers:
    - a. EMSEAL Joint Systems, Ltd; Colorseal: [www.emseal.com/#sle](http://www.emseal.com/#sle).
    - b. Substitutions: See Section 01 6000 - Product Requirements.
- H. Parking/Bridge Deck Joints:
  1. Manufacturers:
    - a. EMSEAL Joint Systems, Ltd; Emshield DFR2 system: [www.emseal.com/#sle](http://www.emseal.com/#sle).
    - b. Substitutions: See Section 01 6000 - Product Requirements.

### **2.03 EXPANSION JOINT COVER ASSEMBLIES**

- A. Expansion Joint Cover Assemblies - General: Factory-fabricated and assembled; designed to completely fill joint openings, sealed to prevent passage of air, dust, water, smoke; suitable for traffic expected.
  - 1. Joint Dimensions and Configurations: As indicated on drawings.
  - 2. Joint Cover Sizes: Selected to suit joint width and configuration, based on manufacturer's published recommendations and limitations.
  - 3. Lengths: Provide covers in full lengths required; avoid splicing wherever possible.
  - 4. Anchors, Fasteners, and Fittings: Provided by cover manufacturer.
- B. Floor Joint Covers: Coordinate with indicated floor coverings.
  - 1. If floor covering is not indicated, obtain instructions from Architect before proceeding.
  - 2. If style is not indicated, provide extruded aluminum frame both sides, resilient seals, and minimize exposed metal.
- C. Resilient Seal Type Covers: Having flat exposed surface without crevices that could collect dirt; designed to withstand expected movement without extrusion of seal from joint assembly; for floors, provide style that is flush with top of floor covering; for exterior joints, weathertight.
- D. Sliding Cover Plate Type Covers: Provide plate with beveled edges and neat fit that does not collect dirt.
- E. Covers In Gypsum Board Assemblies: Provide style with anchoring wings that can be completely covered by joint compound.
- F. Covers In Fire Rated Assemblies: Provide cover assembly having fire rating equivalent to that of assembly into which it is installed.
  - 1. Acceptable Evaluation Agencies: UL (DIR) and ITS (DIR).

### **2.04 MATERIALS**

- A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper; or ASTM B308/B308M, 6061 alloy, T6 temper.
  - 1. Exposed Finish Outdoors: Natural anodized.
  - 2. Exposed Finish at Floors: Mill finish or natural anodized.
  - 3. Exposed Finish at Walls and Ceilings: Natural anodized.
- B. Resilient Seals:
  - 1. For Ceilings: Any resilient material, flush, pleated, or hollow gasket.
  - 2. Color: Floor: Gray Ceilings: White.
- C. All joints specified for 1" wide. Wider joints, if indicated on the drawings, shall be same model series.
- D. Anchors and Fasteners: As recommended by cover manufacturer.
- E. Ferrous Metal Anchors: Galvanized where embedded in concrete or in contact with cementitious materials.
- F. Threaded Fasteners: Aluminum.
- G. Backing Paint for Aluminum Components in Contact with Cementitious Materials: Asphaltic type.
- H. Provide manufacturers associated fire barrier at fire rated walls and floors.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine the area and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

- B. Verify that joint preparation and dimensions are acceptable and in accordance with manufacturer's requirements.
- C. Verify that frames and anchors installed by others are in correct locations and suitable for installation of remainder of assembly.

**3.02 PREPARATION**

- A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

**3.03 INSTALLATION**

- A. Install components and accessories in accordance with manufacturer's instructions.
- B. Align work plumb and level, flush with adjacent surfaces.
- C. Rigidly anchor to substrate to prevent misalignment.

**3.04 PROTECTION**

- A. Do not permit traffic over unprotected floor joint surfaces.
- B. Provide strippable coating to protect finish surface.

**END OF SECTION**



**SECTION 08 1113**  
**HOLLOW METAL DOORS AND FRAMES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Non-fire-rated hollow metal doors and frames.
- B. Hollow metal frames for wood doors.
- C. Fire-rated hollow metal doors and frames.
- D. Thermally insulated hollow metal doors with frames.
- E. Hollow metal borrowed lites glazing frames.
- F. Accessories, including glazing, louvers, matching panels, and removable stops and astragals.

**1.02 RELATED REQUIREMENTS**

- A. Section 08 7100 - Door Hardware.
- B. Section 08 8000 - Glazing: Glass for doors and borrowed lites.
- C. Section 09 9000 - Painting and Coating: Field painting.

**1.03 REFERENCE STANDARDS**

- A. 2012 TAS - Texas Accessibility Standards 2012.
- B. ADA Standards - 2010 ADA Standards for Accessible Design 2010.
- C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100) 2023.
- D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames 2020.
- E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2023.
- F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2021a.
- G. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2023.
- H. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames 2016.
- I. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.
- J. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames 2002.
- K. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames 2011.
- L. NAAMM HMMA 840 - Guide Specifications For Receipt, Storage and Installation of Hollow Metal Doors and Frames 2017.
- M. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames 2014.
- N. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2022.
- O. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames 2023.
- P. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies Current Edition, Including All Revisions.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.
- D. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.
- E. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.
- F. Submit Material Safety Data Sheets under provisions of Section 01 7800 – Closeout Submittals for the following items:
  - 1. All mastics, glues, and adhesives
  - 2. Thermal insulation (excluding fiberglass, foam, rubber)
  - 3. Sealant (interior use only)
  - 4. Fire doors (insulating material)

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.
- B. Maintain at project site copies of reference standards relating to installation of products specified.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Hollow Metal Doors and Frames:
  - 1. Ceco Door, an Assa Abloy Group company: [www.assaabloydss.com/#sle](http://www.assaabloydss.com/#sle).
  - 2. Curries, an Assa Abloy Group company: [www.assaabloydss.com/#sle](http://www.assaabloydss.com/#sle).
  - 3. Deansteel Manufacturing, Inc.: [www.deansteel.com](http://www.deansteel.com).
  - 4. Fleming Door Products, an Assa Abloy Group company: [www.assaabloydss.com/#sle](http://www.assaabloydss.com/#sle).
  - 5. Mesker, dormakaba Group: [www.meskeropeningsgroup.com/#sle](http://www.meskeropeningsgroup.com/#sle).
  - 6. Pearland Industries, Inc.: [www.pearlandindustries.com](http://www.pearlandindustries.com)
  - 7. Republic Doors, an Allegion brand: [www.republicdoor.com/#sle](http://www.republicdoor.com/#sle).
  - 8. Rocky Mountain Metals, Inc.: [www.rockymountainmetals.com](http://www.rockymountainmetals.com).
  - 9. Steelcraft, an Allegion brand: [www.allegion.com/sle](http://www.allegion.com/sle).
  - 10. Substitutions: See Section 01 6000 - Product Requirements.

#### **2.02 PERFORMANCE REQUIREMENTS**

- A. Requirements for Hollow Metal Doors and Frames:
  - 1. Steel Sheet: Comply with one or more of the following requirements; galvanized steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
  - 2. Accessibility: Comply with ICC A117.1, 2012 TAS and ADA Standards.
  - 3. Typical Door Face Sheets: Flush.
  - 4. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.

5. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
6. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
  - a. Based on NAAMM HMMA Custom Guidelines: Provide at least A25/ZF75 (galvannealed) for interior applications, and at least A60/ZF180 (galvannealed) or G60/Z180 (galvanized) for corrosive locations.
- B. Hollow Metal Panels: Same construction, performance, and finish as doors.
- C. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.
- D. Doors at interior locations shall be manufactured of cold rolled, or annealed steel. Doors must be of continuously welded, seamless construction with all angles, molds, returns and miters neatly welded and all weld beads ground smooth for finishing.
- E. Doors at exterior locations shall be manufactured of A60 galvannealed or G60 hot dipped galvanized steel. Doors must be of continuously welded, seamless construction with all angles, molds, returns, and miters neatly welded and all weld beads ground smooth for finishing. All exterior doors shall seal tightly and not allow insect pests easy access to the buildings.
- F. Face sheets of 16 gauge steel reinforced and sound-deadened by 22 gauge formed steel vertical stiffeners spaced not less than 6" o.c. and attached to face sheets by spot welds not less than 5" o.c. Vertical stiffeners at exterior door locations shall be galvannealed or hot dip galvanized. Voids between vertical stiffeners shall be filled with fiberglass batting.
- G. Top and bottom edges closed with continuous recessed steel channels, of not less than 16 gauge, spot welded to both faces. Top edge of exterior doors sealed flush with welded in place closing channel to exclude water.
- H. Overlapping steel astragals for pairs of labeled doors as required by manufacturer to meet codes.
- I. Doors and frames are to be prepared to receive mortise type hardware and at hinge, lock, latch, and all other hardware locations, reinforcing plates shall be spot welded to the inner surface of the jambs. Hinge reinforcements shall not be less than 7 gauge steel. All top hinge reinforcements to incorporate manufacturer's optional high frequency hinge reinforcement or full jamb depth hinge reinforcement. All other hardware reinforcements shall be not less than 12 gauge steel. Where door closers or brackets are to be installed, reinforcing plates shall be not less than 12 gauge steel. Twenty-four gauge galvanized steel plaster guards are to be spot welded over the hardware reinforcing plates. Provide 12 gauge reinforcement, for full height of door leaf, welded inside throat of frame to door rabbet wherever continuous geared hinges are scheduled. Provide 1/2" polystyrene, Celotex, or similar material, adhesive attached to the continuous hinge reinforcement inside the throat of the frame wherever continuous geared hinges are scheduled. Necessary holes for field installation of mortise type hardware shall be drilled and tapped from templates, which are to be furnished to the frame manufacturer by the hardware contractor. Provide suitable reinforcements for surface applied hardware, but no drilling or tapping is to be done at the factory for application of surface applied hardware. Prepare frames for silencers.
- J. All glazing trim shall either be an integral part of the door face on the secure side with a removable bead flush with the opposite door face or metal glass light trim with a projection not to exceed 3/32" from either door face,

### 2.03 FULL AND TWO-LIGHT DOORS

- A. Doors at interior locations shall be manufactured of cold rolled, or annealed steel. Doors must be of welded, seamless tubular stile and rail construction with all angles, tube intersections, molds, returns and miters neatly welded and all weld beads ground smooth for finishing. Visible seams on door faces are not acceptable.
- B. Doors at exterior locations shall be manufactured of A60 galvanized or G60 hot dipped galvanized steel. Doors must be of welded, seamless tubular stile and rail construction with all angles, tube intersections, molds, returns and miters neatly welded and all weld beads ground smooth for finishing. Visible seams on door faces are not acceptable.
- C. Face sheets of 16 gauge steel. Voids in tubular members shall be filled with fiberglass batting.
- D. Vertical stiles, top rail, and intermediate rail (if detailed) shall be of 6" nominal construction. Tubular construction of top rail shall provide a flush top surface to exclude water and moisture. Bottom rail shall be of 12" nominal construction.

### 2.04 HOLLOW METAL DOORS

- A. Exterior Doors: Thermally insulated.
  - 1. Core Material: Vertical steel stiffeners with fiberglass batts.
  - 2. Door Thermal Resistance: R-Value of 6 minimum.
  - 3. Door Thickness: 1-3/4 inch, nominal.
  - 4. Top Closures: Flush with top of faces and edges.
  - 5. Weatherstripping: Refer to Section 08 7100.
- B. Interior Doors, Non-Fire Rated:
  - 1. Door Core Material: Vertical steel stiffeners.
  - 2. Door Thickness: 1-3/4 inch, nominal.
- C. Fire-Rated Doors:
  - 1. Fire Rating: As indicated on drawings, tested in accordance with UL 10C ("positive pressure").
    - a. Temperature-Rise Rating (TRR) Across Door Thickness: In accordance with local building code and authorities having jurisdiction.
    - b. Provide units listed and labeled by UL (Underwriters Laboratories) - UL (BMD).
    - c. Attach fire rating label to each fire rated unit.
  - 2. Core Material: Vertical steel stiffeners.
  - 3. Door Thickness: 1-3/4 inch, nominal.

### 2.05 HOLLOW METAL FRAMES

- A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
- B. Exterior Door Frames: Full profile/continuously welded type.
  - 1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvanized) in accordance with ASTM A653/A653M, with A40/ZF120 coating.
  - 2. Frame Metal Thickness: 14 gage, 0.067 inch, minimum.
  - 3. All angles, molds, returns and miters neatly welded and all weld beads ground smooth for finishing.
  - 4. Weatherstripping: Separate, see Section 08 7100.
- C. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
  - 1. Frame Metal Thickness: 14 gage, 0.067 inch or 16 gage, 0.053 inch, minimum.
  - 2. Three-sided frames for single doors up to and including 4'-0" in width shall be manufactured of 16 gauge steel. Frames for pairs of doors 6'-0" and over, all sidelight frames, and all borrowed light frames shall be manufactured of 14 gauge steel. All angles, molds, returns and miters neatly welded and all weld beads ground smooth for finishing.
- D. Door Frames, Fire-Rated: Full profile/continuously welded type.

1. Fire Rating: Same as door, labeled.
  2. Frame Metal Thickness: 14 gage, 0.067 inch or 16 gage, 0.053 inch, minimum.
  3. Three-sided frames for single doors up to and including 4'-0" in width shall be manufactured of 16 gauge steel. Frames for pairs of doors 6'-0" and over, all sidelight frames, and all borrowed light frames shall be manufactured of 14 gauge steel. All angles, molds, returns and miters neatly welded and all weld beads ground smooth for finishing.
- E. Mullions for Pairs of Doors: Fixed, except where removable is indicated, with profile similar to jambs.
1. All two-piece mullions shall be factory welded to form a single-piece, inseparable section before assembly into a frame unit.
- F. Transom Bars: Fixed, of profile same as jamb and head.

## **2.06 FINISHES**

- A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

## **2.07 ACCESSORIES**

- A. Louvers: Roll formed steel with concealed frame; finish same as door components ; factory-installed.
1. Style: Standard straight slat blade.
  2. Fasteners: Exposed tamper proof fasteners.
- B. Glazing: As specified in Section 08 8000.
- C. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered corners; prepared for countersink style tamper proof screws.
- D. Astragals for Double Doors: Specified in Section 08 7100.
- E. Mechanical Fasteners for Concealed Metal-to-Metal Connections: Self-drilling, self-tapping, steel with electroplated zinc finish.
- F. Grout for Frames: Portland cement grout with maximum 4 inch slump for hand troweling; thinner pumpable grout is prohibited.
- G. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions. Omit silencers on exterior doors.
- H. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.
- I. For each jamb in masonry construction, provide 3 or more 16 gauge adjustable jamb anchors of the T-anchor type or of the wire masonry anchor type spaced not more than 30" apart.
- J. For each jamb in steel stud construction, provide 3 or more 18 gauge drywall type jamb anchors.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Verify that finished walls are in plane to ensure proper door alignment.
- D. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.
- E. Verify exterior substrates and weather barriers have been completed to ensure proper air/water tight transition is maintained.

### **3.02 PREPARATION**

- A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

### **3.03 INSTALLATION**

- A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
- B. Install fire rated units in accordance with NFPA 80.
- C. Where practicable, place frames prior to construction of enclosing walls and ceilings.
- D. Set frames accurately into position, plumbed, aligned, and braced securely until permanent anchors are set.
- E. Coordinate frame anchor placement with wall construction.
- F. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
- G. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
- H. At in-place construction, set frames and secure to adjacent construction with machine screws and suitable anchorage devices. Provide "Z" fillers at each screw location.
- I. Fit and hang doors to maintain specified clearances. Metal hinge shims are acceptable to maintain clearances.
- J. Install door hardware as specified in Section 08 7100.
- K. Comply with glazing installation requirements of Section 08 8000.
- L. Coordinate installation of electrical connections to electrical hardware items.
- M. Immediately after erection, sand smooth all rusted and damaged areas of prime coat, and apply touch-up of compatible air-drying primer.
- N. Touch up damaged factory finishes.

### **3.04 TOLERANCES**

- A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.
- B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

### **3.05 ADJUSTING**

- A. Adjust for smooth and balanced door movement.
- B. Adjust sound control doors so that seals are fully engaged when door is closed.
- C. Test sound control doors for force to close, latch, and unlatch; adjust as necessary in compliance with requirements.

**END OF SECTION**

**SECTION 08 1116**  
**ALUMINUM DOORS AND FRAMES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Glazed interior sliding or swinging aluminum doors and frames.
- B. Aluminum frames.
- C. Flush infill panels.

**1.02 RELATED REQUIREMENTS**

- A. Section 08 7100 - Door Hardware: Hardware for aluminum doors.
- B. Section 08 8000 - Glazing: Glazing materials for aluminum doors and frames.

**1.03 REFERENCE STANDARDS**

- A. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document) 2015.
- B. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2020.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- D. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.
- E. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric) 2014.
- F. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2021.
- G. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2021.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's descriptive literature for each type of door; include information on fabrication methods, finishing, accessories, storage, installation, and maintenance instructions.
- C. Shop Drawings: Include elevations of each opening type, details at each wall type, and schedule of openings.
  - 1. Verify dimensions by field measurements before fabrication and indicate on shop drawings.
- D. Selection Samples: Complete set of color and finish options, using actual materials, for Architect's selection.
- E. Verification Samples: Actual pieces of products in each finish specified, not less than 6 inches square or 6 inches long for linear components. For finishes subject to color variation, include not less than two samples illustrating extreme range to be anticipated.
- F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than five years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of type specified and with at least five years of documented experience.

## **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver aluminum components in manufacturer's standard protective packaging, palletted, crated, or banded together.
- B. Inspect delivered components for damage and replace. Repaired components will not be accepted.
- C. Store components in clean, dry, indoor area, under cover in manufacturer's packaging until installation.
- D. Protect materials and finish from damage during handling and installation.

## **1.07 FIELD CONDITIONS**

- A. Do not begin installation of interior aluminum components until space has been enclosed and ambient thermal conditions are being maintained at levels consistent with final project requirements.

## **1.08 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
- C. Provide ten year manufacturer warranty for defects in workmanship and materials.

# **PART 2 PRODUCTS**

## **2.01 MANUFACTURERS**

- A. Glazed Interior Sliding or Swinging Aluminum Doors and Frames:
  - 1. Cline Aluminum Doors, Inc: [www.clinedoors.com/#sle](http://www.clinedoors.com/#sle).
  - 2. Dual Lock Partition Systems, Inc.; Avalon International: [www.avalonint.com](http://www.avalonint.com).
  - 3. Frameworks Manufacturing: [www.frameworks.com](http://www.frameworks.com).
  - 4. RACO Interior Products, Inc.: [www.racointeriors.com](http://www.racointeriors.com).
  - 5. Versatrac Frames: [www.versatracframes.com](http://www.versatracframes.com).
  - 6. Substitutions: See Section 01 6000 - Product Requirements.

## **2.02 DOORS AND FRAMES**

- A. Basis of Design: Solutions II Swinging and Sliding doors and Frames as manufactured by Raco Interior Products.
- B. Glazed Sliding Aluminum Doors: Extruded aluminum tube frame, full glazed, without middle rail; factory glazed.
  - 1. Frame Depth: 2" x as required to fit wall thicknesses indicated.
  - 2. Stile Width: As indicated on drawings.
  - 3. Finish: Colored anodized.
  - 4. Texture: Smooth.
  - 5. Glazing: As specified in Section 08 8000.
- C. Aluminum Frames for Doors, Sidelights, or Transoms: Extruded aluminum, non-thermally broken hollow or C-shaped sections; no steel components.
  - 1. Frame Depth: 2" x as required to fit wall thicknesses indicated.
  - 2. Finish: Colored anodized.
  - 3. Sidelight/Transom Glazing: As specified in Section 08 8000.
- D. Dimensions and Shapes: As indicated on drawings; dimensions indicated are nominal.
  - 1. Provide vision lites as indicated on drawings.
  - 2. Provide the following clearances:
    - a. Hinge and Lock Stiles: 1/8 inch.
    - b. Between Meeting Stiles: 1/4 inch.
    - c. At Top Rail and Bottom Rail: 1/8 inch.



## **2.03 COMPONENTS**

- A. Tubular Doors: Extruded aluminum tubing, 1/8 inch minimum thickness, with heavy-duty plated steel through bolts in rails, glazing stops, and glazing gaskets.
- B. Frames: Extruded aluminum shapes, not less than 0.062 inch thick, reinforced at hinge and strike locations.
  - 1. Corner Brackets: Extruded aluminum, fastened with stainless steel screws.
  - 2. Trim: Extruded aluminum, not less than 0.062 inch thick, removable snap-in type without exposed fasteners.
- C. Flush Infill Panels for Sidelights/Transoms: Panel face sheet finish and thickness same as doors without any visible seams.
- D. Vision Lites: Extruded aluminum framed, gasket glazed.
  - 1. Glazing: As specified in Section 08 8000.

## **2.04 MATERIALS**

- A. Aluminum Sheet: ASTM B209 (ASTM B209M), alloy 5005, temper H14, stretcher leveled.
- B. Extruded Aluminum: ASTM B221 (ASTM B221M), alloy 6063, temper T5, or alloy 6463, temper T5.

## **2.05 FINISHES**

- A. Class I Color Anodized Finish: Electrolytically deposited colored anodic coating; AAMA 611 AA-M12C22A44, minimum dry film thickness (DFT) of 0.7 mils, 0.0007 inch.

## **2.06 ACCESSORIES**

- A. Fasteners: Aluminum, non-magnetic stainless steel, or other material warranted by manufacturer as non-corrosive and compatible with aluminum components.
- B. Brackets and Reinforcements: Manufacturer's high-strength aluminum units where feasible, otherwise, non-magnetic stainless steel or steel hot-dip galvanized in compliance with ASTM A123/A123M.
- C. Bituminous Coating: Cold-applied asphaltic mastic, compounded for 30-mil thickness per coat.

# **PART 3 EXECUTION**

## **3.01 EXAMINATION**

- A. Verify that wall surfaces and openings are ready to receive frames and are within tolerances specified in manufacturer's instructions.
- B. Verify that frames installed by other trades for installation of doors of this section are in strict accordance with recommendations and approved shop drawings and within tolerances specified in manufacturer's instructions.

## **3.02 PREPARATION**

- A. Perform cutting, fitting, forming, drilling, and grinding of frames as required for project conditions.
- B. Replace components with damage to exposed finishes.
- C. Separate dissimilar metals to prevent electrolytic action between metals.

## **3.03 INSTALLATION**

- A. Install doors and frames in accordance with manufacturer's instructions and approved shop drawings.
- B. Set frames plumb, square, level, and aligned to receive doors. Anchor frames to adjacent construction in strict accordance with manufacturer's recommendations and within specified tolerances.

- C. Where aluminum surfaces contact metals other than stainless steel, zinc, or small areas of white bronze, protect from direct contact by painting dissimilar metal with heavy coating of bituminous paint.
- D. Hang doors and adjust hardware to achieve specified clearances and proper door operation.
- E. Install door hardware as specified in Section 08 7100.
- F. Comply with glazing installation requirements of Section 08 8000.

**3.04 CLEANING**

- A. Upon completion of installation, thoroughly clean door and frame surfaces in accordance with AAMA 609 & 610.
- B. Do not use abrasive, caustic, or acid cleaning agents.

**3.05 PROTECTION**

- A. Protect products of this section from damage caused by subsequent construction until Date of Substantial Completion.
- B. Replace damaged or defective components that cannot be repaired to a condition indistinguishable from undamaged components.

**END OF SECTION**

**SECTION 08 1416  
FLUSH WOOD DOORS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Flush wood doors; flush and flush glazed configuration; fire-rated, non-rated, and acoustical.
- B. High pressure decorative laminate facing

**1.02 RELATED REQUIREMENTS**

- A. Section 01 6210 - Schedule of Materials and Colors
- B. Section 08 1113 - Hollow Metal Doors and Frames.
- C. Section 08 8000 - Glazing.

**1.03 REFERENCE STANDARDS**

- A. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).
- B. ASTM E413 - Classification for Rating Sound Insulation 2022.
- C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition 2014, with Errata (2016).
- D. ICC (IBC) - International Building Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- E. ITS (DIR) - Directory of Listed Products Current Edition.
- F. NEMA LD 3 - High-Pressure Decorative Laminates 2005.
- G. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2022.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
- D. Samples: Submit two samples of door veneer, 6 by 6 inches in size illustrating wood grain, stain color, and sheen.
- E. Test Reports: Show compliance with specified requirements for the following:
  - 1. Sound-retardant doors and frames; sealed panel tests are not acceptable.
- F. Samples: Submit three samples of door veneer, 6 by 6 inch in size illustrating plastic laminate pattern and color.
- G. Manufacturer's Installation Instructions: Indicate special installation instructions.
- H. Specimen warranty.
- I. Warranty, executed in Owner's name.
- J. Closeout Submittals
  - 1. Submit under provisions of Section 01 7800 – Closeout Submittals.
  - 2. Submit Material Safety Data Sheets under provisions of Section 01 7800 – Closeout Submittals for the following items:
    - a. All mastics, glues, and adhesives
    - b. Sealant (interior use only)
    - c. Fire doors (insulating material)

### **1.05 QUALITY ASSURANCE**

- A. Maintain one copy of the specified door quality standard on site for review during installation and finishing.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than five years of documented experience.
  - 1. Company with at least one project within past five years with value of woodwork within at least 20 percent of cost of woodwork for this project.
- C. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.
- D. Certifications
  - 1. Fire Ratings Compliance: Fire-rated wood doors to comply with NFPA-80, Positive Pressure Testing UBC 7-2-97 and/or UL10C, and requirements according to building code standards having local jurisdiction.
  - 2. Label Certification: All doors requiring fire-rating shall carry either UL or ITS (Warnock Hersey) metal label stating:
    - a. Name and Logo of Listing Agency
    - b. Name of Door Manufacturer
    - c. Compliance with UBC 7-2-97 and/or UL10C
    - d. Temperature rise rating
    - e. Compliance with "S" label and/or UL 1784 requirements at all 20-minute rated doors and elsewhere as required by the building code and/or the AHJ
    - f. Hourly rating

### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Package, deliver and store doors in accordance with specified quality standard.
- B. Store doors flat and off the floor on a level surface in a dry, well-ventilated building. Do not store on edge. Protect doors from dirt, water and abuse.
- C. Accept doors on site in manufacturer's packaging, and inspect for damage.
- D. Protect doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas or areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.
- E. Do not subject interior doors to extremes in either heat or humidity. HVAC systems should be operational and balanced, providing a temperature range of 50 to 90 degrees Fahrenheit and 30% to 50% relative humidity.

### **1.07 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, telegraphing core construction, and repair or replacement of the door as originally furnished.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. High Pressure Decorative Laminate (HPDL) Faced Doors:
  - 1. AJW Architectural Products: [www.ajw.com/#sle](http://www.ajw.com/#sle).
  - 2. Oregon Door: [www.oregondoor.com/#sle](http://www.oregondoor.com/#sle).
  - 3. Masonite Architectural: [www.architectural.masonite.com/#sle](http://www.architectural.masonite.com/#sle).
  - 4. Poncraft Door Co: [www.poncraft.com/#sle](http://www.poncraft.com/#sle).
  - 5. VT Industries, Inc: [www.vtindustries.com/#sle](http://www.vtindustries.com/#sle).
  - 6. Substitutions: See Section 01 6000 - Product Requirements.

## **2.02 DOORS AND PANELS**

- A. Doors: See drawings for locations and additional requirements.
  - 1. Quality Standard: Premium Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS), unless noted otherwise.
  - 2. High Pressure Decorative Laminate (HPDL) Faced Doors: 5-ply unless otherwise indicated.
- B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
  - 1. Provide solid core doors at each location.
  - 2. Fire Rated Doors: Tested to ratings as indicated on drawings in accordance with ICC (IBC) - Positive Pressure; Underwriters Laboratories Inc. (UL) labeled.
  - 3. Sound Retardant Doors: Minimum STC of 45, calculated in accordance with ASTM E413, tested in accordance with ASTM E90.
  - 4. High pressure decorative laminate (HPDL) finish as indicated on drawings.

## **2.03 DOOR AND PANEL CORES**

- A. Non-Rated Solid Core and 20 Minute Rated Doors: Type structural composite lumber core (SCLC), plies and faces as indicated.
- B. Fire-Rated Doors: Mineral core type, or fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.
- C. Sound-Rated Doors: Equivalent to type, with particleboard core (PC) construction as required to achieve STC rating specified; plies and faces as indicated above.

## **2.04 DOOR FACINGS**

- A. High Pressure Decorative Laminate (HPDL) Facing for Fire Doors: NEMA LD 3, SGF; color as selected; See Section 01 6210, Schedule of Materials and Colors.
- B. High Pressure Decorative Laminate (HPDL) Facing for Non-Fire-Rated Doors: NEMA LD 3, HGS; color as selected; See Section 01 6210, Schedule of Materials and Colors.
- C. Facing Adhesive: Type I - waterproof.

## **2.05 DOOR CONSTRUCTION**

- A. Fabricate doors in accordance with door quality standard specified.
- B. Cores Constructed with stiles and rails:
  - 1. Provide solid blocks at Lock edge, top of door for closer, and exit devices for hardware reinforcement.
  - 2. Provide solid blocking for other throughbolted hardware.
  - 3. Mineral core veneer doors should have a minimum of 1/2" stile on hinge edge of door. Veneer shall be 5 ply.
- C. Where supplementary protective edge trim is required, install trim after veneer facing has been applied full-width.
- D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
- E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
- F. Cut and configure exterior door edge to receive recessed weatherstripping devices.
- G. Provide edge clearances in accordance with the quality standard specified.

## **2.06 ACCESSORIES**

- A. Hollow Metal Door Frames: See Section 08 1113.
- B. Aluminum Frames: As specified in Section 08 1116 - Aluminum Doors and Frames.

- C. Metal Louvers:
  - 1. Material and Finish: Roll formed steel; pre-painted finish to color as selected.
- D. Glazing: See Section 08 8000.
- E. Glazing Stops: Rolled steel channel shape, mitered corners; prepared for countersink style tamper proof screws.
- F. Astragals for Fire-Rated Double Doors: Steel, T shaped, overlapping and recessed at face edge, specifically for double doors.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

### **3.02 INSTALLATION**

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
  - 1. Install fire-rated doors in accordance with NFPA 80 and ITS (DIR) requirements.
- B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
- C. Use machine tools to cut or drill for hardware.
- D. Coordinate installation of doors with installation of frames and hardware.
- E. Coordinate installation of glazing.
- F. Install door louvers plumb and level.

### **3.03 TOLERANCES**

- A. Comply with specified quality standard for fit and clearance tolerances.
- B. Comply with specified quality standard for telegraphing, warp, and squareness.

### **3.04 ADJUSTING**

- A. Adjust doors for smooth and balanced door movement.
- B. Adjust closers for full closure.

**END OF SECTION**

**SECTION 08 3100  
ACCESS DOORS AND PANELS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Wall and ceiling access door and frame units.
- B. Floor access door and frame units, interior.

**1.02 RELATED REQUIREMENTS**

- A. Section 09 9000 - Painting and Coating: Field paint finish.

**1.03 REFERENCE STANDARDS**

- A. ITS (DIR) - Directory of Listed Products Current Edition.
- B. UL (FRD) - Fire Resistance Directory Current Edition.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.
- C. Shop Drawings: Indicate exact position of each access door and/or panel unit.
- D. Manufacturer's Installation Instructions: Indicate installation requirements, rough-in dimensions, and operation features.
- E. Project Record Documents: Record actual locations of each access unit.
- F. Closeout Submittals
  - 1. Submit under provisions of Section 01 7800 – Closeout Submittals.
  - 2. Submit Material Safety Data Sheets under provisions of Section 01 7800 – Closeout Submittals for the following items:
    - a. All mastics, glues and adhesives
    - b. Sealant (interior use only)
    - c. Fire doors (insulating material)

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years experience.

**PART 2 PRODUCTS**

**2.01 ACCESS DOORS AND PANELS ASSEMBLIES**

- A. Wall-Mounted Units:
  - 1. Material: Steel.
  - 2. Size: 24 by 24 inch, unless otherwise indicated.
    - a. 10 x 10 inches at single valve access and at all roof drain locations on first floor.
  - 3. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
  - 4. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.
  - 5. Gypsum Board Mounting Criteria: Provide drywall bead frame with door surface flush with wall surface.
  - 6. Plaster Mounting Criteria: Provide drywall bead frame with door surface flush with wall surface.
  - 7. Masonry Mounting Criteria: Provide surface-mounted frame with door surface flush with frame surface.

- B. Wall-Mounted Units in Wet Areas:
  - 1. Material: Stainless steel.
  - 2. Size: 24 by 24 inch, unless otherwise indicated.
  - 3. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
  - 4. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.
  - 5. Gypsum Board Mounting Criteria: Provide drywall bead frame with door surface flush with wall surface.
  - 6. Plaster Mounting Criteria: Provide drywall bead frame with door surface flush with wall surface.
  - 7. Masonry Mounting Criteria: Provide surface-mounted frame with door surface flush with frame surface.
- C. Fire-Rated Wall-Mounted Units:
  - 1. Wall Fire-Rating: As indicated on drawings.
  - 2. Material: Steel.
  - 3. Size: 24 by 24 inch, unless otherwise indicated.
  - 4. Door/Panel: Insulated double-surface panel, with tool-operated spring or cam lock and no handle.
- D. Ceiling-Mounted Units:
  - 1. Material: Steel.
  - 2. Size in Other Ceilings: 24 by 24 inch, unless otherwise indicated.
  - 3. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
- E. Fire-Rated Ceiling-Mounted Units:
  - 1. Ceiling Fire-Rating: As indicated on drawings.
  - 2. Material: Steel.
  - 3. Size: 24 by 24 inch, unless otherwise indicated.
  - 4. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
- F. Interior Floor-Mounted Access Units:
  - 1. Location: As indicated on drawings.

## **2.02 FLOOR ACCESS UNITS**

- A. Manufacturers:
  - 1. ACUDOR Products Inc: [www.acudor.com](http://www.acudor.com).
  - 2. Babcock-Davis: [www.babcockdavis.com/sle](http://www.babcockdavis.com/sle).
  - 3. Bilco Company: [www.bilco.com/sle](http://www.bilco.com/sle).
  - 4. Cendrex, Inc: [www.cendrex.com/sle](http://www.cendrex.com/sle).
  - 5. Nystrom, Inc: [www.nystrom.com/sle](http://www.nystrom.com/sle).
  - 6. Substitutions: See Section 01 6000 - Product Requirements.
- B. Interior Floor Access Units: Steel, minimum 1/4 inch thick.
  - 1. Cover: 1/8 inch deep recess with edge molding.
  - 2. Lift Handle: Removable.
  - 3. Manufacturers: Basis of Design
    - a. Non-Fire Rated Units: Bilco, Model K-4
    - b. Fire Rated Units: Bilco, Model FR-4

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that rough openings are correctly sized and located.
- B. Begin installation only after substrates have been properly prepared, and if the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.



### **3.02 PREPARATION**

- A. Clean surfaces thoroughly prior to proceeding with this work.
- B. Prepare surfaces using methods recommended by manufacturer for applicable substrates in accordance with project conditions.

### **3.03 INSTALLATION**

- A. Install units in accordance with manufacturer's instructions.
- B. Install frames plumb and level in openings, and secure units rigidly in place.
- C. Position units to provide convenient access to concealed equipment when necessary.

**END OF SECTION**



**SECTION 08 3313  
COILING COUNTER DOORS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Non-fire-rated steel coiling counter doors and operating hardware.
- B. Non-fire-rated aluminum coiling counter doors and operating hardware (Kitchen tray returns).

**1.02 RELATED REQUIREMENTS**

- A. Section 07 9200 - Joint Sealants: Sealing joints between frames and adjacent construction.
- B. Division 26 - Electrical

**1.03 REFERENCE STANDARDS**

- A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2021.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturer's standard literature showing materials and details of construction and finish. Include data on electrical operation.
- C. Shop Drawings: Indicate rough and actual opening dimensions, anchorage methods, hardware locations, and installation details.
- D. Samples: Submit two slats, 4 inch long, illustrating shape, color and finish texture.
- E. Manufacturer's Instructions: Indicate installation sequence and installation, adjustment, and alignment procedures.
- F. Operation and Maintenance Data: Indicate modes of operation, lubrication requirements and frequency, and periodic adjustments required.

**1.05 QUALITY ASSURANCE**

**1.06 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Submit a written warranty, executed by the Contractor, Installer, and Manufacturer, agreeing to repair or replace doors that fail in materials or workmanship within the specified warranty period.
  - 1. Warranty Period: One (1) year after date of Substantial Completion.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Coiling Counter Doors:
  - 1. C.H.I. Overhead Doors: [www.chiohd.com/#sle](http://www.chiohd.com/#sle).
  - 2. Clopay Building Products: [www.clopaydoor.com/#sle](http://www.clopaydoor.com/#sle).
  - 3. Cornell Iron Works, Inc: [www.cornelliron.com/#sle](http://www.cornelliron.com/#sle).
  - 4. Raynor Garage Doors: [www.raynor.com/#sle](http://www.raynor.com/#sle).
  - 5. The Cookson Company: [www.cooksondoor.com/#sle](http://www.cooksondoor.com/#sle).
  - 6. Wayne-Dalton, a Division of Overhead Door Corporation: [www.wayne-dalton.com/#sle](http://www.wayne-dalton.com/#sle).
  - 7. Substitutions: See Section 01 6000 - Product Requirements.

**2.02 COILING COUNTER DOORS**

- A. Coiling Counter Doors, Non-Fire-Rated: Galvanized steel slat curtain.
  - 1. Locations: Provide at typical locations where indicated on the drawings.
  - 2. Mounting: Interior face mounted.
  - 3. Nominal Slat Size: 1-1/2 inches wide.

4. Slat Profile: Flat.
  5. Finish, Galvanized Steel: Factory powder coated.
  6. Color: As scheduled in Section 01 6210-Schedule of Materials and Colors.
  7. Guides: Aluminum extrusion or formed steel track; same finish unless otherwise indicated.
  8. For exterior facing units, provide weather seal package including bottom bar astragal and guide and head brush seals.
  9. Hood Enclosure: Manufacturer's standard; Powder coated to match curtain.
    - a. Provide mechanism cover for all exposed moving operator components.
  10. Manual hand crank lift operation.
  11. Locking Devices: Slide bolt on inside.
- B. Coiling Counter Doors, Non-Fire-Rated: Aluminum slat curtain.
1. Locations: Provide at Kitchen tray return counters.
  2. Mounting: Interior face mounted.
  3. Nominal Slat Size: 1-1/2 inches wide.
  4. Slat Profile: Flat.
  5. Finish, Aluminum: Clear Anodized.
  6. Guides: Extruded aluminum track; same finish unless otherwise indicated.
  7. Hood Enclosure: Manufacturer's standard; aluminum.
    - a. Provide mechanism cover for all exposed moving operator components.
    - b. Finish, Aluminum: Clear Anodized.
  8. Manual hand crank lift operation.
  9. Locking Devices: Slide bolt on inside.

## **2.03 MATERIALS**

- A. Curtain Construction: Interlocking, single thickness slats.
1. Slat Ends: Alternate slats fitted with end locks to act as wearing surface in guides and to prevent lateral movement.
  2. Curtain Bottom: Fitted with tube or steel angel to provide reinforcement and positive contact in closed position; vinyl astragal along bottom edge.
  3. Steel Slats: ASTM A653/A653M galvanized steel sheet, with minimum G90/Z275 coating; minimum thickness 22 gage, 0.03 inch.
  4. Aluminum Slats: ASTM B221 (ASTM B221M), aluminum alloy Type 6063; minimum thickness 0.04 inch.
- B. Guide Construction: Continuous, of profile to retain door in place, with mounting brackets of same metal.
1. Guides for Galvanized Curtains: Extruded aluminum channel or bent steel shapes.
  2. Aluminum Guides: Extruded aluminum channel, with wool pile runners along inside.
  3. Finish: To match curtain.
- C. Hood Enclosure: Internally reinforced to maintain rigidity and shape.
1. Provide mechanism cover for all exposed moving operator components.
- D. Lock Hardware:
1. Slide Bolt: Provide on single-jamb side, extending into slot in guides, with padlock on one side.
- E. Roller Shaft Counterbalance: Steel pipe and torsion steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension; requiring 25 lb nominal force to operate.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that opening sizes, tolerances and conditions are acceptable.

### **3.02 INSTALLATION**

- A. Install units in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.

### **3.03 TOLERANCES**

- A. Maintain dimensional tolerances and alignment with adjacent work.
- B. Maximum Variation From Plumb: 1/16 inch.
- C. Maximum Variation From Level: 1/16 inch.
- D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft straight edge.

### **3.04 ADJUSTING**

- A. Adjust operating assemblies for smooth and noiseless operation.

### **3.05 CLEANING**

- A. Clean installed components.
- B. Remove labels and visible markings.

**END OF SECTION**



**SECTION 08 3323  
OVERHEAD COILING DOORS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Exterior insulated coiling doors.
- B. Interior non-fire-rated coiling doors.
- C. Fire-rated coiling doors.
- D. Electric operators and control stations.
- E. Wiring from electric circuit disconnect to operators and control stations.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 9200 - Joint Sealants: Sealing joints between frames and adjacent construction.
- B. Division 26 - Electrical

**1.03 REFERENCE STANDARDS**

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2023.
- C. ICC (IECC) - International Energy Conservation Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. ITS (DIR) - Directory of Listed Products Current Edition.
- E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum) 2020.
- F. NEMA MG 1 - Motors and Generators 2021.
- G. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2022.
- I. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives 2022.
- J. UL (DIR) - Online Certifications Directory Current Edition.
- K. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems Current Edition, Including All Revisions.
- L. UL 1784 - Standard for Air Leakage Tests of Door Assemblies Current Edition, Including All Revisions.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide general construction, electrical equipment, and component connections and details.
- C. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.
- D. Samples: Submit two slats, 3 by 6 inches in size illustrating shape, color and finish texture.
- E. Manufacturer's Installation Instructions: Indicate installation sequence and procedures, adjustment and alignment procedures.
- F. Manufacturer's qualification statement.
- G. Installer's qualification statement.
- H. Maintenance Data: Indicate lubrication requirements and frequency and periodic adjustments required.

### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years documented experience and approved by manufacturer.
- C. Products Requiring Electrical Connection: Listed and classified by ITS (DIR), UL (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for purpose specified.

### **1.06 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Submit a written warranty, executed by the Contractor, Installer, and Manufacturer, agreeing to repair or replace doors that fail in materials or workmanship within the specified warranty period.
  - 1. Warranty Period: One (1) year after date of Substantial Completion.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Overhead Coiling Doors:
  - 1. C.H.I. Overhead Doors: [www.chiohd.com/#sle](http://www.chiohd.com/#sle).
  - 2. Clopay Building Products: [www.clopaydoor.com/#sle](http://www.clopaydoor.com/#sle).
  - 3. Cornell Iron Works, Inc: [www.cornelliron.com/#sle](http://www.cornelliron.com/#sle).
  - 4. Raynor Garage Doors: [www.raynor.com/#sle](http://www.raynor.com/#sle).
  - 5. The Cookson Company: [www.cooksondoor.com/#sle](http://www.cooksondoor.com/#sle).
  - 6. Wayne-Dalton, a Division of Overhead Door Corporation: [www.wayne-dalton.com/#sle](http://www.wayne-dalton.com/#sle).
  - 7. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 COILING DOORS**

- A. Exterior Opening Coiling Doors: Steel slat curtain.
  - 1. Capable of withstanding positive and negative design wind loads of 20 psf, without undue deflection or damage to components.
  - 2. Sandwich slat construction with insulated core of foamed-in-place polyurethane insulation; minimum R-value of 8.0.
  - 3. Air Infiltration – Maximum air leakage of 1.00 cfm/ft<sup>2</sup> in accordance with the ICC (IECC) International Energy Conservation Code.
  - 4. Nominal Slat Size: 3 inches wide by required length.
  - 5. Finish: Factory powder coated, color as selected. See Section 01 6210-Schedule of Materials and Colors.
  - 6. Guide, Angles: Powder coated to match curtain.
  - 7. Hood Enclosure: Manufacturer's standard; Powder coated to match curtain.
    - a. Provide mechanism cover for all exposed moving operator components.
  - 8. Electric operation.
  - 9. Mounting: Surface mounted.
- B. Interior Non-Fire-Rated Coiling Doors: Steel slat curtain.
  - 1. Single thickness slats.
  - 2. Nominal Slat Size: 2-1/2 inches wide by required length.
  - 3. Finish: Factory powder coated, color as selected. See Section 01 6210-Schedule of Materials and Colors.
  - 4. Guides, Angles: Powder coated to match curtain.
  - 5. Hood Enclosure: Manufacturer's standard; Powder coated to match curtain.
    - a. Provide mechanism cover for all exposed moving operator components.
  - 6. Electric operation.
  - 7. Mounting: Surface mounted.



- C. Fire-Rated Coiling Doors: Steel slat curtain; comply with NFPA 80.
  - 1. Provide fire rating as indicated on the drawings.
    - a. Provide smoke and draft control door assemblies tested in accordance with UL 1784.
  - 2. Provide products listed and labeled by ITS (DIR) or UL (DIR) as suitable for purpose specified and indicated on drawings.
  - 3. Single thickness slats.
  - 4. Nominal Slat Size: 2-1/2 inches wide by required length.
  - 5. Finish: Factory powder coated, color as selected. See Section 01 6210-Schedule of Materials and Colors.
  - 6. Guides, Angles: Powder coated to match curtain.
  - 7. Hood Enclosure: Manufacturer's standard; Powder coated to match curtain.
    - a. Provide mechanism cover for all exposed moving operator components.
  - 8. Fire Alarm Release Mechanism: Electric-motor operated from fire alarm system.
    - a. Provide a failsafe motor operated door assembly requiring no ancillary or externally mounted release devices, cables, chains, pulleys, reset handles or mechanisms
    - b. Provide an internal electrical failsafe release device that requires no additional wiring, external cables or mounting locations.
    - c. Maintain automatic closure speed at not more than 9" per second.
    - d. Ensure that manual resetting of spring tension, release devices, linkages or mechanical dropouts will not be required.
    - e. Provide 10 second time delay for activation upon loss of power.
  - 9. Electric operation.
  - 10. Mounting: Surface mounted.

### **2.03 MATERIALS AND COMPONENTS**

- A. Metal Curtain Construction: Interlocking slats.
  - 1. Slat Ends: Alternate slats fitted with end locks to act as wearing surface in guides and to prevent lateral movement.
  - 2. Curtain Bottom for Slat Curtains: Fitted with angles or aluminum extrusions to provide reinforcement and positive contact in closed position.
  - 3. Weatherstripping for Exterior Doors: Moisture and rot proof, resilient type, located at jamb edges, bottom of curtain, and lintel brush seal where curtain enters hood enclosure of exterior doors.
  - 4. Smoke Seals: Provide brush or gasket type weatherstripping seals to prevent passage of smoke and hot gases in compliance with UL 1784 testing requirements.
  - 5. Steel Slats: Minimum thickness, 22 gauge, 0.03 inch; ASTM A653/A653M galvanized steel sheet. Provide 20 gauge slats where opening size dictates.
    - a. Galvanizing: Minimum G60 coating.
- B. Guides - Angle: ASTM A36/A36M metal angles, size as required for door configuration.
- C. Hood Enclosure and Trim: Internally reinforced to maintain rigidity and shape.
  - 1. Minimum thickness; 24 gauge, 0.024 inch.
  - 2. Powder coated to match curtain.
  - 3. Provide mechanism cover for all exposed moving operator components.
- D. Lock Hardware:
  - 1. For motor operated units, additional lock or latching mechanisms are not required.
- E. Roller Shaft Counterbalance: Steel pipe and helical steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension; requiring 25 lb nominal force to operate.

### **2.04 ELECTRIC OPERATION**

- A. Operator, Controls, Actuators, and Safeties: Comply with UL 325; provide products listed by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction.
  - 1. Provide tamperproof operation cycle counter.

- B. Electric Operators:
  - 1. Mounting: Front of Coil.
  - 2. Motor Enclosure:
    - a. Interior Coil: NEMA MG 1, Type 1; totally enclosed fan cooled (TEFC).
  - 3. Motor Rating: Minimum 1/3 HP; industrial duty, or as required by the manufacturer.
  - 4. Motor Voltage: 120 volts, single phase, 60 Hz. minimum. Verify with electrical drawings.
  - 5. Controller Enclosure: NEMA 250, Type 1.
  - 6. Opening Speed: 8-9 inches per second.
  - 7. Brake: Manufacturer's standard type, activated by motor controller.
  - 8. Manual override in case of power failure.
  - 9. See Division 26 - Electrical for electrical connections.
- C. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated; enclose terminal lugs in terminal box sized to comply with NFPA 70.
- D. Control Station: Provide standard "Open/Close" key-operated, 'Open-Close-Stop' momentary-contact control device with small format Best type 7-pin cylinder, NEMA 1B for each operator complying with UL 325.
  - 1. 24 volt circuit.
  - 2. Surface mounted, at interior door jamb at CMU walls.
  - 3. Recess mounted, at interior door jamb at gypsum walls.
  - 4. Entrapment Protection Devices: Provide sensing devices and safety mechanisms complying with UL 325.
    - a. Primary Device: Provide monitored sensing edge with wireless edge connection to motor control circuit for momentary contact open/close control.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that opening sizes, tolerances and conditions are acceptable.

### **3.02 INSTALLATION**

- A. Install units in accordance with manufacturer's instructions.
- B. Install fire-rated doors in accordance with NFPA 80.
- C. Install smoke door assemblies in accordance with NFPA 105.
- D. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- E. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- F. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- G. Coordinate installation of electrical service with Division 26 Electrical.
- H. Complete wiring from disconnect to unit components.
- I. Complete wiring from fire alarm system.
- J. Install enclosure and perimeter trim.

### **3.03 TOLERANCES**

- A. Maintain dimensional tolerances and alignment with adjacent work.
- B. Maximum Variation From Plumb: 1/16 inch.
- C. Maximum Variation From Level: 1/16 inch.
- D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 feet straight edge.

### **3.04 ADJUSTING**

- A. Adjust operating assemblies for smooth and noiseless operation.

**3.05 CLEANING**

- A. Clean installed components.
- B. Remove labels and visible markings.

**END OF SECTION**



**SECTION 08 3326  
OVERHEAD COILING GRILLES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Overhead coiling metal grilles and operating hardware; electrically operated.
- B. Wiring from electric circuit disconnect to operator and to control station.

**1.02 RELATED REQUIREMENTS**

- A. Section 08 7100 - Door Hardware: Cylinder cores and keys.
- B. Division 26 - Electrical

**1.03 REFERENCE STANDARDS**

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- B. ITS (DIR) - Directory of Listed Products Current Edition.
- C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum) 2020.
- D. NEMA MG 1 - Motors and Generators 2021.
- E. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- F. UL (DIR) - Online Certifications Directory Current Edition.
- G. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems Current Edition, Including All Revisions.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide general construction component connections and details, and electrical equipment.
- C. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.
- D. Samples: Submit two grille members, 6 by 6 inch in size illustrating shape, color and finish texture.
- E. Manufacturer's Installation Instructions: Indicate installation sequences and procedures, adjustment and alignment procedures.
- F. Manufacturer's Qualification Statement.
- G. Installer's Qualification Statement.
- H. Maintenance Data: Indicate lubrication requirements and frequency and periodic adjustments required.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years documented experience and approved by manufacturer.
- C. Products Requiring Electrical Connection: Listed and classified by ITS (DIR), UL (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for purpose specified.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Overhead Coiling Grilles:
  - 1. C.H.I. Overhead Doors: [www.chiohd.com/#sle](http://www.chiohd.com/#sle).
  - 2. Clopay Building Products: [www.clopaydoor.com/#sle](http://www.clopaydoor.com/#sle).
  - 3. Cornell Iron Works, Inc: [www.cornelliron.com/#sle](http://www.cornelliron.com/#sle).
  - 4. The Cookson Company: [www.cooksondoor.com/#sle](http://www.cooksondoor.com/#sle).
  - 5. Raynor Garage Doors: [www.raynor.com/#sle](http://www.raynor.com/#sle).
  - 6. Wayne-Dalton, a Division of Overhead Door Corporation: [www.wayne-dalton.com/#sle](http://www.wayne-dalton.com/#sle).
  - 7. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 GRILLES AND COMPONENTS**

- A. Grille: Aluminum; horizontal bar curtain, coiling on overhead counterbalanced shaft.
  - 1. Finish: Anodized, Clear.
  - 2. Electric operation.
  - 3. Mounting: Surface mounted.
- B. Curtain: Round horizontal bars connected with vertical links to form a brick pattern.
  - 1. Horizontal bars: 5/16 inch diameter.
  - 2. Bar spacing: 2 inch on center.
  - 3. Tube spacers: 1/2 inch diameter.
  - 4. Spacer spacing: 9 inch on center.
  - 5. Vertical links: Minimum 5/8 by 1/8 inch flat bar.
  - 6. Link spacing: 9 inch on center.
  - 7. Bar Ends: End links to be held in place by self-locking retaining rings.
  - 8. Bottom Bar: Extruded aluminum tubular section with sensing edge seal/cushion.
  - 9. Finish: Anodized, Clear.
- C. Guides: Extruded aluminum section, of profile to retain grille in place with snap-on trim, polypropylene pile runners on both sides of curtain for quiet operation and wall mounting angles of same metal.
  - 1. Finish: Anodized, Clear.
- D. Hood Enclosure and Trim (for exposed coil housing conditions): Sheet metal; completely covering operating mechanisms; internally reinforced to maintain rigidity and shape.
  - 1. Material: Aluminum.
  - 2. Sheet Metal Thickness: 0.040 inch.
  - 3. Finish: Anodized, Clear.
- E. Lock Hardware:
  - 1. Center mounted on bottom bar, keyed locking with Best 7 pin cylinders with removable key core, operable from both sides of grille with lock bars into both jambs, with motor interlock cutout switches.
- F. Roller Shaft Counterbalance: Steel pipe and helical steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension; requiring 25 lb nominal force to operate.

### **2.03 MATERIALS**

- A. Aluminum: ASTM B221 (ASTM B221M).
- B. Galvanized Steel Bars: Galvanized to minimum coating thickness grade in accordance with ASTM A123/A123M.

### **2.04 ELECTRIC OPERATION**

- A. Operator, Controls, Actuators, and Safeties: Comply with UL 325; provide products listed by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction.

1. Provide tamperproof operation cycle counter.
- B. Electric Operators:
  1. Mounting: Front of Coil.
  2. Motor Enclosure:
    - a. Interior Coiling Grilles: NEMA MG 1, Type 1; totally enclosed fan cooled (TEFC).
  3. Motor Rating: 1/3 hp; industrial duty, or as required by the manufacturer.
  4. Motor Voltage: 120 volts, single phase, 60 Hz. Verify with electrical drawings.
  5. Controller Enclosure: NEMA 250 Type 1.
  6. Opening Speed: 8-9 inches per second.
  7. Brake: Manufacturer's standard type, activated by motor controller.
  8. Integral motor mounted interlock sensing to prevent damage to grille and operator when mechanical locking devices are engaged.
  9. Manual override in case of power failure.
  10. See Division 26 - Electrical for electrical connections.
- C. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated; enclose terminal lugs in terminal box sized to comply with NFPA 70.
- D. Control Station: Provide standard "Open/Close" key-operated "Open-Close-Stop" momentary-contact control device with small format Best type 7-pin cylinder, NEMA 1B for each operator complying with UL 325.
  1. 24 volt circuit.
  2. Surface mounted, at interior door jamb at CMU walls.
  3. Recess mounted, at interior door jamb at gypsum walls.
  4. Entrapment Protection Devices: Provide sensing devices and safety mechanisms complying with UL 325.
    - a. Primary Device: Provide monitored sensing edge with wireless edge connection to motor control circuit for momentary contact open/close control.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that opening sizes, tolerances and conditions are acceptable.

### **3.02 INSTALLATION**

- A. Install grille unit assembly in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- E. Coordinate installation of electrical service with Division 26 Electrical.
- F. Complete wiring from disconnect to unit components.
- G. Install enclosure and perimeter trim.

### **3.03 TOLERANCES**

- A. Maintain dimensional tolerances and alignment with adjacent work.
- B. Maximum Variation From Plumb: 1/16 inch.
- C. Maximum Variation From Level: 1/16 inch.
- D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft straight edge.

### **3.04 ADJUSTING**

- A. Adjust grille, hardware and operating assemblies for smooth and noiseless operation.

### **3.05 CLEANING**

- A. Clean grille and components.
- B. Remove labels and visible markings.

**END OF SECTION**



**SECTION 08 3473**  
**SOUND CONTROL DOOR ASSEMBLIES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Sound control door assemblies.
  - 1. Metal doors and frames.
  - 2. Fire-rated doors and frames.
  - 3. Interior doors and frames, non-fire-rated.
- B. Accessories, including glazing and matching panels.

**1.02 RELATED REQUIREMENTS**

- A. Section 08 7100 - Door Hardware.
- B. Section 08 8000 - Glazing: Glass for doors and borrowed lites.

**1.03 ABBREVIATIONS AND ACRONYMS**

- A. ANSI: American National Standards Institute.
- B. ASCE: American Society of Civil Engineers.
- C. BHMA: Builders Hardware Manufacturers Association.
- D. HMMA: Hollow Metal Manufacturers Association.
- E. NAAMM: National Association of Architectural Metal Manufacturers.
- F. NFPA: National Fire Protection Association.
- G. SDI: Steel Door Institute.
- H. UL: Underwriters Laboratories.

**1.04 REFERENCE STANDARDS**

- A. ADA Standards - 2010 ADA Standards for Accessible Design 2010.
- B. ANSI/SDI A250.3 - Test Procedure and Acceptance Criteria for Factory Applied Finish Coatings for Steel Doors and Frames 2019.
- C. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors 2022.
- D. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames 2020.
- E. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100) 2023.
- F. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames 2020.
- G. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2023.
- H. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2021a.
- I. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2023.
- J. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).
- K. ASTM E413 - Classification for Rating Sound Insulation 2022.
- L. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames 2016.

- M. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.
- N. ITS (DIR) - Directory of Listed Products Current Edition.
- O. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames 2002.
- P. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames 2011.
- Q. NAAMM HMMA 840 - Guide Specifications For Receipt, Storage and Installation of Hollow Metal Doors and Frames 2017.
- R. NAAMM HMMA 865 - Guide Specifications for Sound Control Hollow Metal Door and Frame Assemblies 2013.
- S. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2022.
- T. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies 2022.
- U. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames 2023.
- V. SDI 128 - Guidelines for Acoustical Performance of Standard Steel Doors and Frames 2019.
- W. UL (DIR) - Online Certifications Directory Current Edition.
- X. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies Current Edition, Including All Revisions.
- Y. WDMA I.S. 1A - Interior Architectural Wood Flush Doors 2021, with Errata (2022).

#### **1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.
- D. Samples: Submit two samples of metal, showing factory finishes, colors, and surface texture.
- E. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.
- F. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.
- G. Manufacturer's Qualification Statement.
- H. Installer's Qualification Statement.

#### **1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.
- C. Maintain at project site copies of reference standards relating to installation of products specified.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Protect metal doors in compliance with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) and specified requirements.
  - 1. Temporary Frame Spreaders: Provide welded frame jamb spreaders to bottom of metal frame prior to shipping.
- B. Protect wood doors in compliance with WDMA I.S. 1A and specified requirements.

- C. Remove doors and frames from resilient packaging upon delivery on site and inspect for damage, provide cover over doors for protection until installed, and store in vertical position properly braced with blocking to permit air circulation between components.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Metal Sound Control Door Assemblies:
  - 1. Ceco Door, an Assa Abloy Group company: [www.assaabloydss.com/#sle](http://www.assaabloydss.com/#sle).
  - 2. Curries, an Assa Abloy Group company: [www.assaabloydss.com/#sle](http://www.assaabloydss.com/#sle).
  - 3. Industrial Acoustics Co, Inc (IAC): [www.iac-acoustics.com](http://www.iac-acoustics.com)
  - 4. Krieger Specialty Products: [www.kriegerproducts.com](http://www.kriegerproducts.com)
  - 5. Overly Door Company: [www.overly.com/#sle](http://www.overly.com/#sle).
  - 6. Wenger Corporation: [www.wengercorp.com](http://www.wengercorp.com).
  - 7. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 REGULATORY REQUIREMENTS**

- A. Accessibility: Comply with ICC A117.1 and ADA Standards.
- B. Opening Force of Sound Control Doors, Non-Fire Rated: 5 lbs, maximum, in compliance with ADA Standards.
- C. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
- D. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with specified requirements for each type; for instance, a sound control door is also indicated as being an exterior door must comply with requirements specified for sound control doors and exterior doors; where two requirements conflict, comply with most stringent.

### **2.03 COMPONENTS**

- A. Panels: Same construction, performance, and finish as doors.
- B. Metal Door Top Closures: Flush end closure channel, with top and door faces aligned.
- C. Door Edge Profile: Manufacturer's standard for application indicated.
- D. Glazed Lights: Factory installed, with removable stops on secure side; sizes and configurations as indicated on drawings.
  - 1. Style: Manufacturer's standard.

### **2.04 SOUND CONTROL DOORS**

- A. Metal Sound Control Interior Doors: Provide fire-rated door construction as indicated.
  - 1. Metal Doors: Refer to drawings for locations and additional requirements.
    - a. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      - 1) Level 1 - Standard-duty.
      - 2) Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
      - 3) Model 1 - Full Flush.
      - 4) Comply with guidelines of SDI 128 for acoustic performance of metal doors and frames.
      - 5) Door Face Metal Thickness: 20 gauge, 0.032 inch, minimum.
    - b. Steel Sheet: Comply with one or more of the following requirements; galvanized steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.

- 1) Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
  - (a) Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) where necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.
2. Sound Transmission Class (STC) Rating of Sound Control Door Assembly: STC of 50, minimum, tested in accordance with ASTM E413, and tested in accordance with ASTM E90.
3. Door Thickness: As required to comply with sound control requirements as indicated.
4. Door Face Sheets: Flush.
5. Door Finish: Factory primed and field finished.
6. Sound Seals: As required by manufacturer to meet indicated sound control ratings.
7. Interior Doors, Non-Fire Rated:
  - a. Door Core Material: As required by manufacturer to meet indicated sound control ratings.
8. Fire-Rated Doors:
  - a. Fire Rating: As indicated on drawings, complying with NFPA 80 and tested in accordance with UL 10C and NFPA 252 as positive pressure fire tests.
  - b. Provide units listed and labeled by UL (DIR) or ITS (DIR).
    - 1) Attach fire rating label to each fire rated unit.
  - c. Door Core Material: As required by manufacturer to meet indicated fire and sound control ratings.

## **2.05 SOUND CONTROL DOOR FRAMES**

- A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
- B. Metal Sound Control Interior Door Frames: Face welded type.
  1. Frame Finish: Factory primed and field finished.
  2. Interior Door Frames, Non-Fire Rated:
    - a. Frame Metal Thickness: 14 gauge, 0.067 inch, minimum.
  3. Fire-Rated Door Frames:
    - a. Fire Rating: Same as door, and labeled.
    - b. Frame Metal Thickness: 14 gauge, 0.067 inch, minimum.
- C. Mullions for Pairs of Doors: Removable type, with profile similar to jambs.
- D. Transom Bars: Fixed, of profile same as jamb and head.
- E. Provide mortar guard boxes for hardware cut-outs in frames installed in masonry or being grouted.
- F. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inch high to fill opening without cutting masonry units.
- G. Frames Wider than 48 inches: Reinforce with steel channel fitted tightly into frame head, flush with top.

## **2.06 DOOR HARDWARE**

- A. Astragals for Double Doors: Overlapping or meeting stile for field installation in compliance with sound control requirements.
  1. Fire-Rated Doors: Steel, and shape as required for fire rating.
- B. Hinges: Cam lift type by door manufacturer, coordinate with Section 08 7100.
- C. Threshold: Provide sound control/acoustic seal for sill of door in closed position by door manufacturer.

- D. Sound Control Seals: Provide sound control/acoustic seals for jambs and head of door in closed position by door manufacturer.

## **2.07 FINISHES**

- A. Primer, Metal Doors and Frames: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard, in compliance with local VOC requirements.
- B. Metal Door and Frame Finish: Complying with ANSI/SDI A250.3, manufacturer's standard coating.
  - 1. Color: As scheduled.
- C. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

## **2.08 ACCESSORIES**

- A. Glazing: Laminated heat strengthened annealed glass, 1/2 inch (12.7 mm) overall thickness, factory installed, and tested to comply with specified sound control and fire ratings as indicated.
- B. Mechanical Fasteners for Concealed Metal-to-Metal Connections: Self-drilling, self-tapping, steel with electroplated zinc finish.
- C. Grout for Frames: Portland cement grout with maximum of 4 inch slump for hand troweling; thinner pumpable grout of higher slump is not permitted.
  - 1. Grouting of frames in drywall/gypsum board construction is not permitted.
  - 2. Frame to be packed with 10 pound density mineral wool.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Verify that finished walls are in plane to ensure proper door alignment.

### **3.02 PREPARATION**

- A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

### **3.03 INSTALLATION**

- A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
- B. Install fire rated units in accordance with NFPA 80.
- C. Coordinate frame anchor placement with wall construction.
- D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
- E. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 865.
- F. Factory installed glazing, comply with installation requirements; see Section 08 8000.
- G. Coordinate installation of electrical connections to electrical hardware items.
- H. Touch up damaged factory finishes.

### **3.04 TOLERANCES**

- A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 865.
- B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

### **3.05 ADJUSTING**

- A. Adjust for smooth and balanced sound control door movement.

- B. Adjust sound control doors so that seals are fully engaged when door is closed.
- C. Adjust sound control doors for force to close, latch, and unlatch; adjust as necessary in compliance with requirements.

**END OF SECTION**

**SECTION 08 4313**  
**ALUMINUM-FRAMED STOREFRONTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Aluminum-framed storefront, with vision glass.
- B. Aluminum doors and frames.

**1.02 RELATED REQUIREMENTS**

- A. Section 08 7100 - Door Hardware: Hardware items other than specified in this section.
- B. Section 08 8000 - Glazing: Glass and glazing accessories.

**1.03 REFERENCE STANDARDS**

- A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site 2015.
- B. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems 2015.
- C. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2014 (2015 Errata).
- D. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures Most Recent Edition Cited by Referring Code or Reference Standard.
- E. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2014.
- F. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- G. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.
- H. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric) 2014.
- I. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2014.
- J. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2013.
- K. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen 2004 (Reapproved 2012).
- L. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference 2014.
- M. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference 2000 (Reapproved 2016).
- N. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference 2015.
- O. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic) 2019.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate with installation of other components that comprise the exterior enclosure.
- B. Preinstallation Meeting: Conduct a preinstallation meeting two weeks before starting work of this section; require attendance by all affected installers.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, internal drainage details.
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.
  - 1. Include design engineer's stamp or seal on shop drawings for attachments and anchors.
- D. Shop drawing sheets that include engineering information designed by the Contractor's Delegated Design Engineer shall be signed and sealed in accordance with the Texas Engineering Practice Act. Sheets that do not provide information designed by the Contractor's Engineer do not require being signed and sealed. Calculation packages require a signed and sealed cover sheet only. Any submittals requiring to be signed and sealed that are received without the signature and seal will be rejected without review.
- E. Samples: Accompanying the Shop Drawings, submit:
  - 1. Sample of each exposed member.
  - 2. Samples of finish, showing complete range of color from darkest to lightest proposed for use on this Work.
  - 3. Samples, when approved by the Architect, will be used to verify that the installed finish is within the approved range.
- F. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations stamped and signed by a Structural Engineer licensed in the State of Texas.
- G. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.
- H. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.
- I. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

#### **1.06 QUALITY ASSURANCE**

- A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in Texas.
- B. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least five years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of type specified and with at least five years of documented experience.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

#### **1.08 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a two year period after Date of Substantial Completion.
- C. Provide two year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
- D. Provide two year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.



## **PART 2 PRODUCTS**

### **2.01 BASIS OF DESIGN -- FRAMING FOR INSULATING GLAZING (EXTERIOR)**

- A. Center-Set Style, Thermally-Broken:
  - 1. Basis of Design: Kawneer Company Inc; Trifab VG 451T Storefront System.
  - 2. Basis of Design: Kawneer Company Inc; Trifab 601T Storefront System.
  - 3. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.
  - 4. Vertical Mullion Dimensions: 2 inches wide by 6 inches deep.
- B. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed below:
  - 1. Arcadia, Inc.: [www.arcadiainc.com](http://www.arcadiainc.com)
  - 2. Atlas Architectural Metals, Inc.: [www.atlasarchmetals.com](http://www.atlasarchmetals.com).
  - 3. Columbia Commercial Building Products: [ccbpwin.com](http://ccbpwin.com).
  - 4. C.R. Laurence Company, Inc; U.S. Aluminum: [www.crl-arch.com/sle](http://www.crl-arch.com/sle).
  - 5. EFCO, a Pella Company: [www.efcocorp.com/sle](http://www.efcocorp.com/sle).
  - 6. Kawneer Company, Inc.: [www.kawneer.com](http://www.kawneer.com).
  - 7. Manko Window Systems, Inc.: [www.mankowindows.com](http://www.mankowindows.com).
  - 8. Oldcastle BuildingEnvelope: [www.oldcastlebe.com](http://www.oldcastlebe.com).
  - 9. Trulite Glass & Aluminum Solutions, LLC: [www.trulite.com](http://www.trulite.com).
  - 10. Tubelite, Inc.: [www.tubeliteinc.com](http://www.tubeliteinc.com)
  - 11. YKK AP America Inc: [www.ykkap.com](http://www.ykkap.com).
- C. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 BASIS OF DESIGN -- FRAMING FOR MONOLITHIC GLAZING (INTERIOR)**

- A. Center-Set Style:
  - 1. Basis of Design: Kawneer Company Inc; Trifab VG 451 Storefront System.
  - 2. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.
- B. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed below:
  - 1. Arcadia, Inc.: [www.arcadiainc.com](http://www.arcadiainc.com)
  - 2. Atlas Architectural Metals, Inc.: [www.atlasarchmetals.com](http://www.atlasarchmetals.com).
  - 3. Columbia Commercial Building Products: [ccbpwin.com](http://ccbpwin.com).
  - 4. C.R. Laurence Company, Inc; U.S. Aluminum: [www.crl-arch.com/sle](http://www.crl-arch.com/sle).
  - 5. EFCO, a Pella Company: [www.efcocorp.com/sle](http://www.efcocorp.com/sle).
  - 6. Kawneer Company, Inc.: [www.kawneer.com](http://www.kawneer.com).
  - 7. Manko Window Systems, Inc.: [www.mankowindows.com](http://www.mankowindows.com).
  - 8. Oldcastle BuildingEnvelope: [www.oldcastlebe.com](http://www.oldcastlebe.com).
  - 9. Trulite Glass and Aluminum Solutions, LLC: [www.trulite.com](http://www.trulite.com).
  - 10. Tubelite, Inc.: [www.tubeliteinc.com](http://www.tubeliteinc.com)
  - 11. YKK AP America Inc: [www.ykkap.com](http://www.ykkap.com).
- C. Substitutions: See Section 01 6000 - Product Requirements.

### **2.03 BASIS OF DESIGN -- SWINGING DOORS**

- A. Wide Stile, Insulating Glazing, Not Thermally-Broken:
  - 1. Basis of Design: Kawneer Company Inc; 500 Heavy Wall Entrance Door.
  - 2. Thickness: 2 inches.
- B. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed below:
  - 1. Arcadia, Inc.: [www.arcadiainc.com](http://www.arcadiainc.com)
  - 2. Atlas Architectural Metals, Inc.: [www.atlasarchmetals.com](http://www.atlasarchmetals.com).
  - 3. Columbia Commercial Building Products: [ccbpwin.com](http://ccbpwin.com).
  - 4. C.R. Laurence Company, Inc; U.S. Aluminum: [www.crl-arch.com/sle](http://www.crl-arch.com/sle).

5. EFCO, a Pella Company: [www.efcocorp.com/sle](http://www.efcocorp.com/sle).
6. Kawneer Company, Inc.: [www.kawneer.com](http://www.kawneer.com).
7. Manko Window Systems, Inc.: [www.mankowindows.com](http://www.mankowindows.com).
8. Oldcastle BuildingEnvelope: [www.oldcastlebe.com](http://www.oldcastlebe.com).
9. Trulite Glass & Aluminum Solutions, LLC: [www.trulite.com](http://www.trulite.com).
10. Tubelite, Inc.: [www.tubeliteinc.com](http://www.tubeliteinc.com)
11. YKK AP America Inc: [www.ykkap.com](http://www.ykkap.com).

C. Substitutions: See Section 01 6000 - Product Requirements.

## **2.04 STOREFRONT**

- A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
1. Finish: Class I color anodized.
    - a. Factory finish all surfaces that will be exposed in completed assemblies.
  2. Finish Color: Refer to Section 01 6210-Schedule of Materials and Colors
  3. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
  4. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
  5. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
  6. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
  7. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
  8. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
  9. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glazing and inner sheet of infill panel and heel bead of glazing compound.
  10. Preparation for Window Treatments: Provide reinforced interior horizontal head rail.
- B. Performance Requirements:
1. General Requirements
    - a. Drawings are diagrammatic and do not purport to identify nor solve problems of thermal or structural movement, glazing, anchorage or moisture disposal.
    - b. Requirements shown by details are intended to establish basic dimension of units, sight lines and profiles of members.
    - c. Provide concealed fastening.
    - d. Provide entrance and storefront systems, including necessary modifications, to meet specified requirements and maintaining visual design concepts.
    - e. Attachment considerations are to take into account site peculiarities and expansion and contraction movements so there is no possibility of loosening, weakening or fracturing connection between units and building structure or between units themselves.
    - f. Anchors, fasteners and braces shall be structurally stressed not more than 50% of allowable stress when maximum loads are applied.
    - g. Provide for expansion and contraction without detriment to appearance or performance.
    - h. Assemblies shall be free from rattles, wind whistles and noise due to thermal and structural movement and wind pressure.

- i. Not Permitted: Vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system.
  - j. Coordinate all door hardware with Section 08 7100 – Door Hardware.
- 2. Frame calculations shall be designed by a registered engineer in the State of Texas. Manufacturer is responsible for system reinforcing.
- 3. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
  - a. Design Wind Loads: Comply with requirements of ASCE 7.
  - b. Member Deflection: Limit member deflection to 1/175 in any direction, with full recovery of glazing materials.
- 4. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 8 psf.
- 5. Air Leakage Laboratory Test: Maximum of 0.06 cu ft/min sq ft of wall area, when tested in accordance with ASTM E283 at 6.27 psf pressure differential across assembly.
- 6. Thermal Requirements:
  - a. Framing systems shall accommodate expansion and contraction movement due to surface temperature differentials of 180° F without causing buckling, stress on glass, failure of joint seals, excessive stress on structural elements, reduction of performance, or other detrimental effects.
  - b. Ensure doors function normally within limits of specified temperature range.
  - c. Thermal Break with a 1/4" separation consisting of a two part chemically curing, high density polyurethane which is mechanically and adhesively joined to aluminum storefront sections.

## **2.05 COMPONENTS**

- A. Aluminum Framing Members: Tubular aluminum sections, drainage holes and internal weep drainage system.
  - 1. Framing members for interior applications need not be thermally broken.
  - 2. Glazing Stops: Flush.
  - 3. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.
  - 4. High Performance Sub Sill.
- B. Aluminum Subframing and Subsills: Extruded aluminum, thermally broken to match framing members where required, integrate with framing member drainage system.
  - 1. Finish: Same as storefront.
  - 2. Subframing: At perimeter of units, where indicated.
  - 3. Flat Fillers: At head and jambs of exterior units where no subframing is indicated.
  - 4. Sub-sills: At high-performance sills at exterior units.
- C. Glazing: As specified in Section 08 8000.
- D. Swing Doors: Glazed aluminum.
  - 1. Thickness: 2 inches. with .188 inch wall thickness
  - 2. Top Rail: 5 inches wide. Provide manufacturer's closure plate as required to accept door closure.
  - 3. Vertical Stiles: 5 inches wide.
  - 4. Mid Rail: 8 1/4 inches wide.
  - 5. Bottom Rail: 10 inches wide.
  - 6. Glazing Stops: Square.
  - 7. Finish: Same as storefront.

## **2.06 MATERIALS**

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).

- B. Sheet Aluminum: ASTM B209 (ASTM B209M).
- C. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.
- D. Internal Reinforcing:
  - 1. ASTM A36 for carbon steel; or ASTM B308 for structural aluminum.
  - 2. Shapes and sizes to suit installation.
  - 3. Shop coat steel components after fabrication with alkyl type zinc chromate primer complying with FS TT-P-645.
- E. Anchorage Devices:
  - 1. Manufacturer's standard formed or fabricated steel or aluminum assemblies of shapes, plates, bars or tubes.
- F. Fasteners:
  - 1. Aluminum, non-magnetic stainless steel or other materials warranted by manufacturer to be non-corrosive and compatible with components being fastened.
  - 2. Do not use exposed fasteners, except where unavoidable for application of hardware.
  - 3. For exposed locations, provide countersunk Phillips head screws with finish matching items fastened.
  - 4. For concealed locations, provide manufacturer's standard fasteners.
  - 5. Provide nuts or washers of design having means to prevent disengagement; deforming of fastener threads is unacceptable.
- G. Exposed Flashings: Aluminum sheet, 20 gage, 0.032 inch minimum thickness; finish to match framing members.
- H. Glazing Reducer:
  - 1. 451-VG-029 Snap-in 1/4" infill adapter or equal by the frame manufacturer for storefront located at interior locations.
- I. Glazing Gaskets:
  - 1. Compression type design, replaceable, molded or extruded, of neoprene, or ethylene propylene diene monomer (EPDM).
  - 2. Conform to ASTM C509 or C864.
  - 3. Profile and hardness as required to maintain uniform pressure for watertight seal.
  - 4. Provide in manufacturer's standard black color.
- J. Weatherstripping:
  - 1. Wool pile conforming to AAMA 701.2; or extruded EPDM elastomeric conforming to ASTM C509 or C864.
  - 2. Provide EPDM or vinyl-blade gasket weatherstripping in bottom door rail, adjustable for contact with threshold.
- K. "Anti-Walk" Edge Blocking: "W" shaped EPDM blocks for use in keeping glazing material stationary under vibration or seismic loading.
- L. Baffles (at weep holes): Type as recommended by system manufacturer and shown in published installation instructions.
- M. Glazing Accessories: As specified in Section 08 8000.
- N. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

## **2.07 FINISHES**

- A. Class I Color Anodized Finish: AAMA 611 AA-M12C22A44 Electrolytically deposited colored anodic coating not less than 0.7 mils thick.
- B. Touch-Up Materials: As recommended by coating manufacturer for field application.

## **2.08 FABRICATION**

- A. Coordination of Fabrication:

1. Check actual frame or door openings required in construction work by accurate field measurements before fabrication.
  2. Fabricate units to withstand loads which will be applied when system is in place.
- B. General:
1. Conceal fasteners wherever possible.
  2. Reinforce work as necessary for performance requirements and for support to structure.
  3. Comply with Section 08 8000 for glazing requirements.
- C. Aluminum Framing:
1. Provide members of size, shape and profile indicated, designed to provide for glazing from interior.
  2. Fabricate frame assemblies with joints straight and tight fitting.
  3. Maintain accurate relation of planes and angles, with hairline fit of contacting members.
  4. Seal horizontals and direct moisture accumulation to exterior.
  5. Provide flashings and other materials used internally or externally that are corrosive resistant, non-staining, non-bleeding and compatible with adjoining materials.
  6. Provide manufacturer's extrusions and accessories to accommodate expansion and contraction due to temperature changes without being detrimental to appearance or performance.
  7. Make provisions in framing for minimum edge clearance, nominal edge cover and nominal pocket width for thickness and type of glazing or infill used in accordance with recommendations of manufacturer.
  8. Provide tight fitting, injection molded, plastic water deflectors at all intermediate horizontals.
  9. Provide thermally broken aluminum backer plate at perimeter of all windows and individual sealed aluminum caps at the top of all vertical window frame mullions.
  10. Provide fully soldered/sealed end dams at ends of subsill system.
- D. Entrance Doors:
1. Fabricate with mechanical joints using internal reinforcing plates and shear blocks attached with fasteners and by welding.
  2. Provide extruded aluminum glazing stops of square design, permanently anchored on security side and removable on opposite side.
- E. Welding:
1. Comply with recommendations of the American Welding Society.
  2. Use recommended electrodes and methods to avoid distortion and discoloration.
  3. Grind exposed welds smooth and flush with adjacent surfaces; restore mechanical finish.
- F. Flashings: Form from sheet aluminum with same finish as extruded sections. Apply finish after fabrication. Material thickness as required to suit condition without deflection or "oil-canning".

## **2.09 HARDWARE**

- A. Receive hardware supplied in accordance with Section 08 7100 – Door Hardware and install in accordance with requirements of this Section.
- B. Cut, reinforce, drill and tap frames and doors as required to receive hardware.
- C. Comply with hardware manufacturer's templates and instructions.
- D. Use concealed fasteners wherever possible.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

### **3.02 INSTALLATION**

- A. Install wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Verify exterior substrates and weather barriers have been completed to ensure proper air/water tight transition is maintained.
- D. Provide alignment attachments and shims to permanently fasten system to building structure.
- E. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- F. Provide thermal isolation where components penetrate or disrupt building insulation.
- G. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- H. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
- I. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- J. Install operating sash.
- K. Set thresholds in bed of sealant and secure.
- L. Install hardware using templates provided.
- M. Install glass and infill panels in accordance with Section 08 8000, using glazing method required to achieve performance criteria.
- N. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

### **3.03 TOLERANCES**

- A. Maximum Variation from Plumb: 0.06 inch per 3 feet non-cumulative or 0.06 inch per 10 feet, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

### **3.04 FIELD QUALITY CONTROL**

- A. See Section 01 4000 - Quality Requirements, for general testing and inspection requirements.
- B. Air/Water Leakage Testing: Provide chamber test per ASTM E1105 at 10% of glazing area per building, to be performed at mockup, 35% and 50% completion.
  - 1. Testing to be performed at 0.67 times the ASTM E331 rated pressure provided by the manufacturer for the system, not less than 5.6 psf.
- C. Water-Spray Test: Provide water spray quality test of installed storefront components in accordance with AAMA 501.2 during construction process and before installation of interior finishes.
  - 1. Perform a minimum of two tests in each designated area as indicated on drawings.
  - 2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.

### **3.05 ADJUSTING**

- A. Test door operating functions. Adjust closing and latching speeds and other hardware in accordance with manufacturer's instructions to ensure smooth operation.
- B. Adjust operating hardware for smooth operation.

### **3.06 CLEANING**

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths, and take care to remove dirt from corners and to wipe surfaces clean.

**3.07 PROTECTION**

- A. Protect installed products from damage until Date of Substantial Completion.

**END OF SECTION**





**SECTION 08 4413**  
**GLAZED ALUMINUM CURTAIN WALLS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Aluminum-framed curtain wall, with vision glazing and glass infill panels.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 8400 - Firestopping: Firestop at system junction with structure.
- B. Section 08 8000 - Glazing.

**1.03 REFERENCE STANDARDS**

- A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site 2015.
- B. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems 2015.
- C. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2014 (2015 Errata).
- D. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections 2009.
- E. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures Most Recent Edition Cited by Referring Code or Reference Standard.
- F. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2014.
- G. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- H. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2014.
- I. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2013.
- J. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants 2018.
- K. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen 2004 (Reapproved 2012).
- L. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference 2014.
- M. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference 2000 (Reapproved 2016).
- N. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference 2015.
- O. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic) 2019.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate with installation of other components that comprise the exterior enclosure.
- B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, internal drainage details, glazing, and infill.

- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.
- D. Samples: Accompanying the Shop Drawings, submit:
  - 1. Sample of each exposed member.
  - 2. Samples of finish, showing complete range of color from darkest to lightest proposed for use on this Work.
  - 3. Samples, when approved by the Architect, will be used to verify that the installed finish is within the approved range.
- E. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
- F. Design Data: Provide framing member structural and physical characteristics and engineering calculations, and identify dimensional limitations; include load calculations at points of attachment to building structure.
- G. Shop drawing sheets that include engineering information designed by the Contractor's Delegated Design Engineer shall be signed and sealed in accordance with the Texas Engineering Practice Act. Sheets that do not provide information designed by the Contractor's Engineer do not require being signed and sealed. Calculation packages require a signed and sealed cover sheet only. Any submittals requiring to be signed and sealed that are received without the signature and seal will be rejected without review.
- H. Test Reports: Submit results of full-size mock-up testing. Reports of tests previously performed on the same design are acceptable.
- I. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.
- J. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

#### **1.06 QUALITY ASSURANCE**

- A. Designer Qualifications: Design curtain wall and its structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at Texas.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than five years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of type specified and with at least five years of documented experience.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

#### **1.08 FIELD CONDITIONS**

- A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

#### **1.09 WARRANTY**

- A. See Section 01 7700 - Closeout Procedures, for additional warranty requirements.
- B. Correct defective Work within a two year period after Date of Substantial Completion.
- C. Provide two year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
- D. Provide two year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

## **PART 2 PRODUCTS**

### **2.01 BASIS OF DESIGN**

- A. Pressure Cap Four Sides; Not Unitized, Field Assembled:
  - 1. Basis of Design: Kawneer Company Inc; 1600 Curtain Wall System.
- B. Other Manufacturers: Provide either product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed below.
  - 1. Arcadia, Inc.: [www.arcadiainc.com](http://www.arcadiainc.com)
  - 2. Atlas Architectural Metals, Inc.: [www.atlasarchmetals.com](http://www.atlasarchmetals.com).
  - 3. Columbia Commercial Building Products: [ccbpwin.com](http://ccbpwin.com)
  - 4. C.R. Laurence Company, Inc; U.S. Aluminum: [www.crl-arch.com](http://www.crl-arch.com).
  - 5. EFCO, a Pella Company: [www.efcocorp.com/sle](http://www.efcocorp.com/sle).
  - 6. Kawneer Company, Inc.: [www.kawneer.com](http://www.kawneer.com)
  - 7. Manko Window Systems, Inc.: [www.mankowindows.com](http://www.mankowindows.com)
  - 8. Oldcastle BuildingEnvelope: [www.oldcastlebe.com](http://www.oldcastlebe.com).
  - 9. Trulite Glass & Aluminum Solutions, LLC: [www.trulite.com](http://www.trulite.com).
  - 10. Tubelite, Inc.: [www.tubeliteinc.com](http://www.tubeliteinc.com)
  - 11. YKK AP America Inc: [www.ykkap.com](http://www.ykkap.com).
- C. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 BASIS OF DESIGN - SWINGING DOORS**

- A. Wide Stile, Insulating Glazing, Not Thermally-Broken:
  - 1. Basis of Design: Kawneer Company Inc; 500 Heavy Wall Entrance Door.
  - 2. Thickness: 2 inches.
- B. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed below:
  - 1. Arcadia, Inc.: [www.arcadiainc.com](http://www.arcadiainc.com)
  - 2. Atlas Architectural Metals, Inc.: [www.atlasarchmetals.com](http://www.atlasarchmetals.com).
  - 3. Columbia Commercial Building Products: [ccbpwin.com](http://ccbpwin.com)
  - 4. C.R. Laurence Co., Inc; U.S. Aluminum: [www.crl-arch.com](http://www.crl-arch.com).
  - 5. EFCO, a Pella Company: [www.efcocorp.com](http://www.efcocorp.com).
  - 6. Kawneer Company, Inc.: [www.kawneer.com](http://www.kawneer.com)
  - 7. Manko Window Systems, Inc.: [www.mankowindows.com](http://www.mankowindows.com)
  - 8. Oldcastle BuildingEnvelope: [www.oldcastlebe.com](http://www.oldcastlebe.com).
  - 9. Trulite Glass & Aluminum Solutions, LLC: [www.trulite.com](http://www.trulite.com).
  - 10. Tubelite, Inc.: [www.tubeliteinc.com](http://www.tubeliteinc.com)
  - 11. YKK AP America Inc.: [www.ykkap.com](http://www.ykkap.com).
- C. Substitutions: See Section 01 6000 - Product Requirements.

### **2.03 CURTAIN WALL**

- A. Aluminum-Framed Curtain Wall: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
  - 1. Fabrication Method: Either shop/factory or field fabricated system.
  - 2. Glazing Method: Either shop/factory or field glazed system.
  - 3. Mullion Dimensions: 2-1/2 inches by depth as required by engineered drawings for structural performance.
  - 4. Finish: Class I color anodized.
    - a. Factory finish surfaces that will be exposed in completed assemblies.
    - b. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
  - 5. Provide flush joints and corners, weathersealed, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for imposed loads.

6. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
7. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
8. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
9. Preparation for Window Treatments: Provide reinforced interior horizontal head rail.
- B. Structural Performance Requirements: Design and size components to withstand the following load requirements without damage or permanent set.
  1. Design Wind Loads: Comply with the requirements of ASCE 7.
    - a. Measure performance by testing in accordance with ASTM E330/E330M, using test loads equal to 1.5 times the design wind loads and 10 second duration of maximum pressure.
    - b. Member Deflection: For spans less than 13 feet 6 inches, limit member deflection to flexure limit of glass in any direction, and maximum of 1/175 of span or 3/4 inch, whichever is less and with full recovery of glazing materials.
    - c. Member Deflection: For spans over 13 feet 6 inches and less than 40 feet, limit member deflection to flexure limit of glass in any direction, and maximum of 1/240 of span plus 1/4 inch, with full recovery of glazing materials.
  2. Movement: Accommodate the following movement without damage to components or deterioration of seals:
    - a. Expansion and contraction caused by 180 degrees F surface temperature.
    - b. Expansion and contraction caused by cycling temperature range of 170 degrees F over a 12 hour period.
    - c. Movement of curtain wall relative to perimeter framing.
    - d. Deflection of structural support framing, under permanent and dynamic loads.
- C. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on indoor face when tested as follows:
- D. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on indoor face when tested as follows:
  1. Test Pressure Differential: 12 psf.
  2. Test Method: ASTM E331.
- E. Air Leakage: Maximum of 0.06 cu ft/min sq ft of wall area, when tested in accordance with ASTM E283 at 6.24 psf pressure differential across assembly.
- F. Thermal Performance Requirements:
  1. Condensation Resistance Factor of Framing: 71, minimum, measured in accordance with AAMA 1503.
  2. Overall U-value Including Glazing: 0.46 Btu/(hr sq ft deg F), maximum.

## **2.04 COMPONENTS**

- A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
  1. Framing members for interior applications need not be thermally broken.
- B. Glazing: As specified in Section 08 8000.

## **2.05 MATERIALS**

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.
- C. Fasteners: Stainless steel; type as required or recommended by curtain wall manufacturer.

- D. Exposed Flashings: Aluminum sheet, 20 gage, 0.032 inch minimum thickness; finish to match framing members.
- E. Firestopping: As specified in Section 07 8400.
- F. Weatherseal Sealant: Silicone, with adhesion in compliance with ASTM C794; compatible with glazing accessories.
- G. Sill Flashing Sealant: Elastomeric, silicone or polyurethane, and compatible with flashing material.
- H. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
- I. Glazing Accessories: As specified in Section 08 8000.
- J. Shop and Touch-Up Primer for Steel Components: Zinc oxide, alkyd, linseed oil primer appropriate for use over hand cleaned steel.
- K. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

## **2.06 FINISHES**

- A. Class I Color Anodized Finish: AAMA 611 AA-M12C22A44 Electrolytically deposited colored anodic coating not less than 0.7 mils thick.

## **2.07 FABRICATION**

- A. Coordination of Fabrication:
  - 1. Check actual frame or door openings required in construction work by accurate field measurements before fabrication.
  - 2. Fabricate units to withstand loads which will be applied when system is in place.
- B. General:
  - 1. Conceal fasteners wherever possible.
  - 2. Reinforce work as necessary for performance requirements and for support to structure.
  - 3. Comply with Section 08 8000 for glazing requirements.
- C. Aluminum Framing:
  - 1. Provide members of size, shape and profile indicated, designed to provide for glazing from interior.
  - 2. Fabricate frame assemblies with joints straight and tight fitting.
  - 3. Maintain accurate relation of planes and angles, with hairline fit of contacting members.
  - 4. Seal horizontals and direct moisture accumulation to exterior.
  - 5. Provide flashings and other materials used internally or externally that are corrosive resistant, non-staining, non-bleeding and compatible with adjoining materials.
  - 6. Provide manufacturer's extrusions and accessories to accommodate expansion and contraction due to temperature changes without being detrimental to appearance or performance.
  - 7. Make provisions in framing for minimum edge clearance, nominal edge cover and nominal pocket width for thickness and type of glazing or infill used in accordance with recommendations of manufacturer.
  - 8. Provide tight fitting, injection molded, plastic water deflectors at all intermediate horizontals.
  - 9. Provide thermally broken aluminum backer plate at perimeter of all windows and individual aluminum caps at the top of all vertical window frame mullions.
  - 10. Provide fully soldered end dams at ends of subsill system.
- D. Entrance Doors:
  - 1. Fabricate with mechanical joints using internal reinforcing plates and shear blocks attached with fasteners and by welding.
  - 2. Provide extruded aluminum glazing stops of square design, permanently anchored on security side and removable on opposite side.

- E. Welding:
  - 1. Comply with recommendations of the American Welding Society.
  - 2. Use recommended electrodes and methods to avoid distortion and discoloration.
  - 3. Grind exposed welds smooth and flush with adjacent surfaces; restore mechanical finish.
- F. Flashings: Form from sheet aluminum with same finish as extruded sections. Apply finish after fabrication. Material thickness as required to suit condition without deflection or "oil-canning".

## **2.08 HARDWARE**

- A. Receive hardware supplied in accordance with Section 08 7100 – Door Hardware and install in accordance with requirements of this Section.
- B. Cut, reinforce, drill and tap frames and doors as required to receive hardware.
- C. Comply with hardware manufacturer's templates and instructions.
- D. Use concealed fasteners wherever possible.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify dimensions, tolerances, and method of attachment with other related work.
- B. Verify that curtain wall openings and adjoining air and vapor seal materials are ready to receive work of this section.
- C. Verify that anchorage devices have been properly installed and located.

### **3.02 INSTALLATION**

- A. Install curtain wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- G. Install firestopping at each floor slab edge.
- H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- I. Pressure Plate Framing: Install glazing and infill panels in accordance with Section 08 8000, using glazing method required to achieve performance criteria.
- J. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

### **3.03 TOLERANCES**

- A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 0.5 inches per 100 ft, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.
- C. Sealant Space Between Curtain Wall Mullions and Adjacent Construction: Maximum of 3/4 inch and minimum of 1/4 inch.

### **3.04 FIELD QUALITY CONTROL**

- A. Provide services of curtain wall manufacturer's field representative to observe for proper installation of system and submit report.
- B. See Section 01 4000 - Quality Requirements, for general testing and inspection requirements.

- C. Air/Water Leakage Testing: Provide chamber test per ASTM E1105 at 10% of glazing area per building, to be performed at mockup, 35% and 50% completion.
  - 1. Testing to be performed at 0.67 times the ASTM E331 rated pressure provided by the manufacturer for the system, not less than 5.6 psf.
- D. Water-Spray Test: Provide water spray quality test of installed curtain wall components in accordance with AAMA 501.2 during construction process and before installation of interior finishes.
  - 1. Perform a minimum of two tests in each designated area as indicated on drawings.
  - 2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.

### **3.05 ADJUSTING**

- A. Adjust operating sash for smooth operation.

### **3.06 CLEANING**

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths, take care to remove dirt from corners, and wipe surfaces clean.

### **3.07 PROTECTION**

- A. Protect installed products from damage until Date of Substantial Completion.

### **END OF SECTION**





**SECTION 08 7100  
DOOR HARDWARE**

**PART 1 - GENERAL  
1.01 SUMMARY**

A. Section includes:

1. Mechanical and electrified door hardware
2. Electronic access control system components

B. Section excludes:

1. Windows
2. Cabinets (casework), including locks in cabinets
3. Signage
4. Toilet accessories
5. Overhead doors

C. Related Sections:

1. Division 01 Section "Alternates" for alternates affecting this section.
2. Division 06 Section "Rough Carpentry"
3. Division 06 Section "Finish Carpentry"
4. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
5. Division 08 Sections:
  - a. "Metal Doors and Frames"
  - b. "Flush Wood Doors"
  - c. "Stile and Rail Wood Doors"
  - d. "Interior Aluminum Doors and Frames"
  - e. "Aluminum-Framed Entrances and Storefronts"
  - f. "Stainless Steel Doors and Frames"
  - g. "Special Function Doors"
  - h. "Entrances"
6. Division 26 "Electrical" sections for connections to electrical power system and for low-voltage wiring.
7. Division 28 "Electronic Safety and Security" sections for coordination with other components of electronic access control system and fire alarm system.

**1.02 REFERENCES**

A. UL LLC

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies
3. UL 1784 - Air Leakage Tests of Door Assemblies
4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Keying Systems and Nomenclature
4. Installation Guide for Doors and Hardware

C. NFPA – National Fire Protection Association

1. NFPA 70 – National Electric Code
2. NFPA 80 – 2016 Edition – Standard for Fire Doors and Other Opening Protectives
3. NFPA 101 – Life Safety Code
4. NFPA 105 – Smoke and Draft Control Door Assemblies
5. NFPA 252 – Fire Tests of Door Assemblies

D. ANSI - American National Standards Institute

1. ANSI A117.1 – 2017 Edition – Accessible and Usable Buildings and Facilities
2. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
3. ANSI/BHMA A156.28 - Recommended Practices for Keying Systems
4. ANSI/WDMA I.S. 1A - Interior Architectural Wood Flush Doors
5. ANSI/SDI A250.8 - Standard Steel Doors and Frames

### 1.03 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
2. Prior to forwarding submittal:
  - a. Review drawings and Sections from related trades to verify compatibility with specified hardware.
  - b. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.

B. Action Submittals:

1. Product Data: Submit technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
  - a. Wiring Diagrams: For power, signal, and control wiring and including:
    - 1) Details of interface of electrified door hardware and building safety and security systems.
    - 2) Schematic diagram of systems that interface with electrified door hardware.
    - 3) Point-to-point wiring.
    - 4) Risers.
3. Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated and tagged with full description for coordination with schedule.

- a. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.
- 4. Door Hardware Schedule:
  - a. Submit concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work critical in Project construction schedule.
  - b. Submit under direct supervision of a Door Hardware Institute (DHI) certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule published by DHI.
  - c. Indicate complete designations of each item required for each opening, include:
    - 1) Door Index: door number, heading number, and Architect's hardware set number.
    - 2) Quantity, type, style, function, size, and finish of each hardware item.
    - 3) Name and manufacturer of each item.
    - 4) Fastenings and other pertinent information.
    - 5) Location of each hardware set cross-referenced to indications on Drawings.
    - 6) Explanation of all abbreviations, symbols, and codes contained in schedule.
    - 7) Mounting locations for hardware.
    - 8) Door and frame sizes and materials.
    - 9) Degree of door swing and handing.
    - 10) Operational Description of openings with electrified hardware covering egress, ingress (access), and fire/smoke alarm connections.
- 5. Key Schedule:
  - a. After Keying Conference, provide keying schedule that includes levels of keying, explanations of key system's function, key symbols used, and door numbers controlled.
  - b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
  - c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
  - d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
  - e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
  - f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.
- C. Informational Submittals:
  - 1. Provide Qualification Data for Supplier, Installer and Architectural Hardware Consultant.
  - 2. Provide Product Data:
    - a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
    - b. Include warranties for specified door hardware.
- D. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
  - a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
  - b. Catalog pages for each product.
  - c. Final approved hardware schedule edited to reflect conditions as installed.
  - d. Final keying schedule
  - e. Copy of warranties including appropriate reference numbers for manufacturers to identify project.
  - f. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.

E. Inspection and Testing:

1. Submit written reports to the Owner and Authority Having Jurisdiction (AHJ) of the results of functional testing and inspection for:
  - a. Fire door assemblies, in compliance with NFPA 80.
  - b. Required egress door assemblies, in compliance with NFPA 101.

## **1.04 QUALITY ASSURANCE**

A. Qualifications and Responsibilities:

1. Supplier: Recognized architectural hardware supplier with a minimum of 5 years documented experience supplying both mechanical and electromechanical door hardware similar in quantity, type, and quality to that indicated for this Project. Supplier to be recognized as a factory direct distributor by the manufacturer of the primary materials with a warehousing facility in the Project's vicinity. Supplier to have on staff, a certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.
3. Architectural Hardware Consultant: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
  - a. For door hardware: DHI certified AHC or DHC.
  - b. Can provide installation and technical data to Architect and other related subcontractors.
  - c. Can inspect and verify components are in working order upon completion of installation.
  - d. Capable of producing wiring diagram and coordinating installation of electrified hardware with Architect and electrical engineers.
4. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

B. Certifications:

1. Fire-Rated Door Openings:
  - a. Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction.

- b. Provide only items of door hardware that are listed products tested by UL LLC, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.
- 2. Smoke and Draft Control Door Assemblies:
  - a. Provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105
  - b. Comply with the maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.
- 3. Electrified Door Hardware
  - a. Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.
- 4. Accessibility Requirements:
  - a. Comply with governing accessibility regulations cited in "REFERENCES" article 087100, 1.02.D3 herein for door hardware on doors in an accessible route. This project must comply with all Federal Americans with Disability Act regulations and all Local Accessibility Regulations.

C. Pre-Installation Meetings

- 1. Keying Conference
  - a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
    - 1) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
    - 2) Preliminary key system schematic diagram.
    - 3) Requirements for key control system.
    - 4) Requirements for access control.
    - 5) Address for delivery of keys.
- 2. Pre-installation Conference
  - a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - b. Inspect and discuss preparatory work performed by other trades.
  - c. Inspect and discuss electrical roughing-in for electrified door hardware.
  - d. Review sequence of operation for each type of electrified door hardware.
  - e. Review required testing, inspecting, and certifying procedures.
  - f. Review questions or concerns related to proper installation and adjustment of door hardware.
- 3. Electrified Hardware Coordination Conference:
  - a. Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping.

- B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.
- C. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
- D. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.
- E. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.
- F. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

#### **1.06 COORDINATION**

- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.
- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
- D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

#### **1.07 WARRANTY**

- A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within published warranty period.
  - 1. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
  - 2. Warranty Period: Beginning from date of Substantial Completion, for durations indicated in manufacturer's published listings.
    - a. Mechanical Warranty
      - 1) Extra Heavy Duty Cylindrical Locks: 10 years
      - 2) Exit Devices: 3 years
      - 3) Closers: 30 years
    - b. Electrical Warranty: 1 year

#### **1.08 MAINTENANCE**

- A. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.
- B. Turn over unused materials to Owner for maintenance purposes.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Approval of alternate manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturers" in the individual article for the product category are only to be considered by official substitution request in accordance with section 01 25 00.
- B. Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.
- C. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.
- D. The below listed manufactures are considered acceptable provided written authorization from Tomball ISD has been secured and is presented with submittal for validation.

ITEM:	MANUFACTURER:	ACCEPTABLE SUB:
Hinges	(IVE) Ives	Hager, McKinney
Key System	(SCH) Schlage	No Substitution
Locks	(SCH) Schlage	No Substitution
Exit Devices	(VON) Von Duprin	No Substitution
Closers	(LCN) LCN	No Substitution
Auto Flush Bolts	(IVE) Ives	DCI, Rockwood
Coordinators	(IVE) Ives	Hager, Rockwood
Silencers	(IVE) Ives	Hager, Rockwood
Push & Pull Plates	(IVE) Ives	Hager, Rockwood
Vandal Resistant Trim	(IVE) Ives	Owner's Standard
Kickplates	(IVE) Ives	Hager, Rockwood
Stops & Holders	(IVE) Ives	Hager, Rockwood
Overhead Stops	(GLY) Glynn-Johnson	ABH
Thresholds	(ZER) Zero Int.	NGP, Pemko
Seals & Bottoms	(ZER) Zero Int.	NGP, Pemko
Key Cabinets	(LUN) Lund	TelKee

### **2.02 MATERIALS**

- A. Fabrication
  - 1. Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. provide screws according to manufacturer's recognized installation standards for application intended.
  - 2. Finish exposed screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.

3. Provide concealed fasteners wherever possible for hardware units exposed when door is closed. Coordinate with "Metal Doors and Frames", "Flush Wood Doors", "Stile and Rail Wood Doors" to ensure proper reinforcements. Advise the Architect where visible fasteners, such as thru bolts, are required.
- B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.
  1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.
- C. Cable and Connectors:
  1. Where scheduled in the hardware sets, provide each item of electrified hardware and wire harnesses with number and gage of wires enough to accommodate electric function of specified hardware.
  2. Provide Molex connectors that plug directly into connectors from harnesses, electric locking and power transfer devices.
  3. Provide through-door wire harness for each electrified locking device installed in a door and wire harness for each electrified hinge, electrified continuous hinge, electrified pivot, and electric power transfer for connection to power supplies.

## **2.03 HINGES**

- A. Requirements:
  1. Provide hinges conforming to ANSI/BHMA A156.1.
  2. Provide five knuckle, ball bearing hinges.
  3. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
    - a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
    - b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high
  4. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
    - a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
    - b. Interior: Heavy weight, steel, 5 inches (127 mm) high
  5. 2 inches or thicker doors:
    - a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
    - b. Interior: Heavy weight, steel, 5 inches (127 mm) high
  6. Adjust hinge width for door, frame, and wall conditions to allow proper degree of opening.
  7. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
  8. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
    - a. Steel Hinges: Steel pins
    - b. Non-Ferrous Hinges: Stainless steel pins
    - c. Out-Swinging Exterior Doors: Non-removable pins
    - d. Out-Swinging Interior Lockable Doors: Non-removable pins
    - e. Interior Non-lockable Doors: Non-rising pins
  9. Provide hinges with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component. Provide mortar guard for each electrified hinge specified.



## **2.04 ELECTRIC POWER TRANSFER**

### **A. Manufacturers:**

1. Scheduled Manufacturer and Product:
  - a. Von Duprin EPT-10

### **B. Requirements:**

1. Provide power transfer with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
2. Locate electric power transfer per manufacturer's template and UL requirements, unless interference with operation of door or other hardware items.

## **2.05 FLUSH BOLTS**

### **A. Manufacturers:**

1. Scheduled Manufacturer:
  - a. Ives

### **B. Requirements:**

1. Provide automatic, constant latching, and manual flush bolts with forged bronze or stainless-steel face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch (305 mm) steel or brass rods at doors up to 90 inches (2286 mm) in height. For doors over 90 inches (2286 mm) in height increase top rods by 6 inches (152 mm) for each additional 6 inches (152 mm) of door height. Provide dust-proof strikes at each bottom flush bolt.

## **2.06 COORDINATORS**

### **A. Manufacturers:**

1. Scheduled Manufacturer:
  - a. Ives

### **B. Requirements:**

1. Where pairs of doors are equipped with automatic flush bolts, an astragal, or other hardware that requires synchronized closing of the doors, provide bar-type coordinating device, surface applied to underside of stop at frame head.
2. Provide filler bar of correct length for unit to span entire width of opening, and appropriate brackets for parallel arm door closers, surface vertical rod exit device strikes, or other stop mounted hardware. Factory-prepared coordinators for vertical rod devices as specified.

## **2.07 CYLINDRICAL LOCKS**

### **A. Manufacturers and Products:**

1. Scheduled Manufacturer and Product:
    - a. Schlage ND series
  2. Acceptable Manufacturers and Products:
    - a. No Substitute
- B. Requirements:
1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 1, and UL Listed for 3-hour fire doors.
  2. Cylinders: Refer to "KEYING" article, herein.
  3. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2-inch latch throw. Provide proper latch throw for UL listing at pairs.
  4. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
  5. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
  6. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
  7. Provide electrified options as scheduled in the hardware sets.
  8. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.
    - a. Vandlgard: Provide levers with vandal resistant technology for use at heavy traffic or abusive applications.
    - b. Lever Design: Schlage Sparta (SPA)
  9. Specific room functions:
    - a. Teacher, Staff and Adult single restrooms - ND40
    - b. Classroom and Teacher Lounge doors – ND70
    - c. Single user student restrooms off classrooms (eg. Kindergarten and Pre-K), Adult uni-sex restroom ahead of security vestibule at entrance only, clinic student restrooms, staff restroom inside kitchen area, staff restroom inside custodial restroom – ND40
    - d. Communicating Classroom Doors – ND82
    - e. Electronic locks (AD300) on owner specified doors (by Division 28 13 00)

## **2.08 EXIT DEVICES**

- A. Manufacturers and Products:
1. Scheduled Manufacturer and Product:
    - a. Von Duprin 99/ series
  2. Acceptable Manufacturers and Products:
    - a. No Substitute
- B. Requirements:
1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
  2. Cylinders: Refer to "KEYING" article, herein.
  3. Provide grooved touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
  4. Touchpad must extend a minimum of one half of door width. No plastic inserts are allowed in touchpads.

5. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
6. Provide exit devices with weather resistant components that can withstand harsh conditions of various climates and corrosive cleaners used in outdoor pool environments.
7. Provide flush end caps for exit devices.
8. Provide exit devices with manufacturer's approved strikes.
9. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
10. Mount mechanism case flush on face of doors or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
11. Provide cylinder or hex-key dogging as specified at non fire-rated openings.
12. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
13. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.
14. Provide electrified options as scheduled.
15. Top latch mounting: double- or single-tab mount for steel doors, face mount for aluminum doors eliminating requirement of tabs, and double tab mount for wood doors.
16. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.
17. No Vertical Rod Devices. Supply rim devices with key removable mullion.

## **2.09 Keying Requirements**

- A. Key System: Schlage Primus XP utility-patented keyway on exterior doors only, conventional cylinders. Utility patent protection to extend at least until 2039. Key blanks available only from factory-direct sources, not available from after-market key blank manufacturers. For estimate use factory GMK charge. Initiate and conduct meetings(s) with Owner and I-R Security & Safety Consultants representatives to determine system key-way(s) and structure. Furnish Owner's written approval of the system.
1. Existing factory registered master key system.
  2. Stamp all keys, cylinder plugs and core face with keyset symbol "VKC"
  3. Supply 2 cut keys per cylinder
  4. Supply 2 cut master keys for each master and grand master used in project.
  5. Supply 100 key blanks.
  6. Supply 500 electronic key fobs the design of which is specified by owner
  7. Non-I.C. construction keying: furnish Split-key. At substantial completion, remove inserts in Owner's presence; demonstrate consequent non-operability of construction key. Give all removed inserts and all construction keys to Owner.
  8. Furnish 10 construction keys.
  9. Furnish 2 construction insert extractor tool 35-057.
  10. Furnish 2 construction control keys.
  11. Furnish (2) key cabinets and (2) tag filing systems, size of boxes to be determined by owner
  12. Furnish 2 Grand Master Primus XP control keys
  13. Furnish 20 P&S locking keys for light switches
  14. All keys must be turned over to the District Locksmith with a transmittal sheet

- B. At Substantial Completion, Contractor to remove inserts in Owner's presence and demonstrate consequent non-operability of construction key. Contractor to give all removed inserts and all construction keys to Owner. Owner's District locksmith will install permanent cylinders.
- C. Bitting List: furnish secured shipment direct from point of origination to Owner's Director of Maintenance upon completion. Locksmith will set up key box; Contractor to hang key box in location(s) determined by Owner.
- D. Initiate and conduct keying meeting(s) with Owner and I-R Security & Safety Consultants representatives to determine system keyway(s) and structure. Furnish Owner's written approval of the system
- E. Key Cylinders: furnish conventional 6-pin solid brass construction by same manufacturer. New Construction shall all be FSIC removable core format for all interior locksets.
- F. Furnish Schlage Primus XP interchangeable core cylinders for all exterior exit devices. Interior exit devices and mullions shall be non-Primus cores.
- G. Cylinders/Cylinder cores: furnish keyed at factory of lock manufacturer where permanent records are maintained. Locks and cylinders same manufacturer and secure shipment direct to owner.
- H. Permanent keys: furnish secured shipment direct from point of origination to Owner.

## **2.10 DOOR CLOSERS**

### **A. Manufacturers and Products:**

- 1. Scheduled Manufacturer and Product:
  - a. LCN 4040XP series
- 2. Acceptable Manufacturers and Products:
  - a. No Substitute

### **B. Requirements:**

- 1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
- 2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
- 3. Cylinder Body: 1-1/2-inch (38 mm) diameter piston with 5/8-inch (16 mm) diameter double heat-treated pinion journal. QR code with a direct link to maintenance instructions.
- 4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
- 5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards. Provide snap-on cover clip, with plastic covers, that secures cover to spring tube.
- 6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck. Provide graphically labelled instructions on the closer body adjacent to each adjustment valve. Provide positive stop on reg valve that prevents reg screw from being backed out.

7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
8. Pressure Relief Valve (PRV) Technology: Not permitted.
9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.
11. Heavy Duty arms (EDA) at exterior doors scheduled with parallel arm units.
12. All closers to be through bolted.
13. All teacher lounges to receive closer.
14. All exterior closers to be supplied with Cush Arms

## **2.11 DOOR TRIM**

### **A. Manufacturers:**

1. Scheduled Manufacturer:
  - a. Ives

### **B. Requirements:**

1. Provide push plates, push bars, pull plates, pulls, and hands-free reversible door pulls with diameter and length as scheduled.

## **2.12 PROTECTION PLATES**

### **A. Manufacturers:**

1. Scheduled Manufacturer:
  - a. Ives

### **B. Requirements:**

1. Provide protection plates with a minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes plates 2 inches (51 mm) less width of door on single doors, pairs of doors with a mullion, and doors with edge guards. Size plates 1 inch (25 mm) less width of door on pairs without a mullion or edge guards.
3. At fire rated doors, provide protection plates over 16 inches high with UL label.

## **2.13 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS**

### **A. Manufacturers:**

1. Scheduled Manufacturers:
  - a. Glynn-Johnson

### **B. Requirements:**

1. Provide overhead stop at any door where conditions do not allow for a wall stop or floor stop presents tripping hazard.
2. Provide friction type at doors without closer and positive type at doors with closer.

## **2.14 DOOR STOPS AND HOLDERS**

### **A. Manufacturers:**

1. Scheduled Manufacturer:
  - a. Ives

### **B. Provide door stops at each door leaf:**

1. Provide wall stops wherever possible. Provide concave type where lockset has a push button or thumbturn.
2. Where a wall stop cannot be used, provide universal floor stops.
3. Where wall or floor stop cannot be used, provide overhead stop.
4. Provide roller bumper where doors open into each other and overhead stop cannot be used.

## **2.15 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING**

### **A. Manufacturers:**

1. Scheduled Manufacturer:
  - a. Zero International

### **B. Requirements:**

1. Provide thresholds, weather-stripping, and gasketing systems as specified and per architectural details. Match finish of other items.
2. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
4. Size thresholds 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width unless otherwise specified in the hardware sets or detailed in the drawings.

## **2.16 SILENCERS**

### **A. Manufacturers:**

1. Scheduled Manufacturer:
  - a. Ives

### **B. Requirements:**

1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.

3. Omit where gasketing is specified.

## **2.17 FINISHES**

### **A. FINISH: BHMA 626/652 (US26D); EXCEPT:**

1. Hinges at Exterior Doors: BHMA 630 (US32D)
2. Aluminum Geared Continuous Hinges: BHMA 628 (US28)
3. Push Plates, Pulls, and Push Bars: BHMA 630 (US32D)
4. Protection Plates: BHMA 630 (US32D)
5. Overhead Stops and Holders: BHMA 630 (US32D)
6. Door Closers: Powder Coat to Match
7. Wall Stops: BHMA 630 (US32D)
8. Latch Protectors: BHMA 630 (US32D)
9. Weatherstripping: Clear Anodized Aluminum
10. Thresholds: Mill Finish Aluminum

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION**

- A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
  1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
  2. Custom Steel Doors and Frames: HMMA 831.
  3. Interior Architectural Wood Flush Doors: ANSI/WDMA I.S. 1A
  4. Installation Guide for Doors and Hardware: DHI TDH-007-20
- B. Install door hardware in accordance with NFPA 80, NFPA 101 and provide post-install inspection, testing as specified in section 1.03.E unless otherwise required to comply with governing regulations.
- C. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.
- D. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.

- E. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
- F. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- G. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.
- H. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated.
- I. Lock Cylinders:
  - 1. Install construction cores to secure building and areas during construction period.
  - 2. Replace construction cores with permanent cores as indicated in keying section.
  - 3. Furnish permanent cores to Owner for installation.
- J. Wiring: Coordinate with Division 26, ELECTRICAL and Division 28 ELECTRONIC SAFETY AND SECURITY sections for:
  - 1. Conduit, junction boxes and wire pulls.
  - 2. Connections to and from power supplies to electrified hardware.
  - 3. Connections to fire/smoke alarm system and smoke evacuation system.
  - 4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
  - 5. Connections to panel interface modules, controllers, and gateways.
  - 6. Testing and labeling wires with Architect's opening number.
- K. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
- L. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.
- M. Closer/Holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.
- N. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.
- O. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- P. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.
- Q. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- R. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.



- S. Door Bottoms and Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.

### **3.03 ADJUSTING**

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
  - 1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

### **3.04 CLEANING AND PROTECTION**

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items per manufacturer's instructions to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

### **3.05 DOOR HARDWARE SCHEDULE**

- A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.
- B. Discrepancies, conflicting hardware, and missing items are to be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application.
- C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.

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Hardware Sets:

86693 OPT0248699 Version 3

Hardware Group No. 001

PROVIDE EACH RU DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	FSIC MORTISE CYLINDER	20-061 ICX W/CONST. CORE	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	HARDWARE	REMAINDER OF HARDWARE BY DOOR MFG	FBO	UNK

COORDINATE LOCKING REQUIREMENTS WITH DOOR MANUFACTURER.

Hardware Group No. 101

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ENTRANCE LOCK	ND53TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER

Hardware Group No. 103

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ENTRANCE LOCK	ND53TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER

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Hardware Group No. 200S

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	AUTO FLUSH BOLT	FB31P/FB41P AS REQ	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM LOCK	ND80TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	COORDINATOR	COR X FL X MB X HW PREPS X LENGTH AS REQ	628	IVE
2	EA	OH STOP	90S	630	GLY
2	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
2	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER
2	EA	MEETING STILE	8193AA (2 PCS - 1 SET) HEIGHT AS REQ (OMIT @ NON-RATED DOORS)	AA	ZER

Hardware Group No. 201

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	ND80TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER

Hardware Group No. 201C

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	ND80TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER

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Hardware Group No. 201CW

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	ND80TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER

Hardware Group No. 201VW

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	ND80TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER
1	EA	VIEWER	698	626	IVE

Hardware Group No. 201W

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	ND80TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER

Hardware Group No. 203

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	ND80TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER

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Hardware Group No. 203S

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	ND80TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	OH STOP	90S	630	GLY
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER

Hardware Group No. 203W

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5	652	IVE
1	EA	STOREROOM LOCK	ND80TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER

Hardware Group No. 206

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	AUTO FLUSH BOLT	FB31P/FB41P AS REQ	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM LOCK	ND80TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	COORDINATOR	COR X FL X MB X HW PREPS X LENGTH AS REQ	628	IVE
2	EA	OH STOP	90S	630	GLY
2	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
2	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER
2	EA	MEETING STILE	8193AA (2 PCS - 1 SET) HEIGHT AS REQ (OMIT @ NON-RATED DOORS)	AA	ZER

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Hardware Group No. 212

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	CONST LATCHING BOLT	FB51P/FB61P AS REQ	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM LOCK	ND80TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
2	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER
2	EA	MEETING STILE	8193AA (2 PCS - 1 SET) HEIGHT AS REQ (OMIT @ NON-RATED DOORS)	AA	ZER

Hardware Group No. 212S

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	CONST LATCHING BOLT	FB51P/FB61P AS REQ	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM LOCK	ND80TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
2	EA	OH STOP	90S	630	GLY
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER
2	EA	MEETING STILE	8193AA (2 PCS - 1 SET) HEIGHT AS REQ (OMIT @ NON-RATED DOORS)	AA	ZER

Hardware Group No. 301G

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK	ND40S SPA K510-066	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J	BK	ZER

Hardware Group No. 303GW

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5 NRP	652	IVE
1	EA	PRIVACY LOCK	ND40S SPA K510-066	626	SCH
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J	BK	ZER

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Hardware Group No. 305

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	CLASSROOM LOCK	ND70TD SPA K510-066	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH SRI TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA (OMIT @ COVERED OPENINGS)	AA	ZER
1	EA	GASKETING SET	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-226	A	ZER

Hardware Group No. 401

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	ND10S SPA K510-066	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER

Hardware Group No. 403

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	ND10S SPA K510-066	626	SCH
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER

Hardware Group No. 412

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	CONST LATCHING BOLT	FB51P/FB61P AS REQ	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	PASSAGE SET	ND10S SPA K510-066	626	SCH
2	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER
2	EA	MEETING STILE	8193AA (2 PCS - 1 SET) HEIGHT AS REQ (OMIT @ NON-RATED DOORS)	AA	ZER

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Hardware Group No. 501

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	ND70TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER

Hardware Group No. 501A

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PIVOT SET	7215 SET	626	IVE
1	EA	INTERMEDIATE PIVOT	7215 INT	626	IVE
1	EA	CLASSROOM LOCK	ND70TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	SET	SEAL	PERIMETER SEAL BY FRAME MANUFACTURER		

NOTE: CONFIRM STILE IS WIDE ENOUGH TO ACCOMODATE LOCKSET.

Hardware Group No. 501W

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	ND70TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER

Hardware Group No. 503

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	ND70TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER



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Hardware Group No. 503W

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	ND70TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER

Hardware Group No. 505

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	CLASSROOM LOCK	ND70TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH SRI TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA (OMIT @ COVERED OPENINGS)	AA	ZER
1	EA	GASKETING SET	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-226	A	ZER

Hardware Group No. 507A

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PIVOT SET	7215 SET	626	IVE
1	EA	INTERMEDIATE PIVOT	7215 INT	626	IVE
1	EA	CLASSROOM LOCK	ND70TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	SET	SEAL	PERIMETER SEAL BY FRAME MANUFACTURER		

NOTE: CONFIRM STILE IS WIDE ENOUGH TO ACCOMODATE LOCKSET.

Hardware Group No. 510S

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	CONST LATCHING BOLT	FB51P/FB61P AS REQ	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	CLASSROOM LOCK	ND70TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	OH STOP	90S	630	GLY
2	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
2	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER
2	EA	MEETING STILE	8193AA (2 PCS - 1 SET) HEIGHT AS REQ (OMIT @ NON-RATED DOORS)	AA	ZER

Hardware Group No. 700ACM

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	PIVOT SET	7215 SET	626	IVE
2	EA	INTERMEDIATE PIVOT	7215 INT	626	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
2	EA	PANIC HARDWARE	99-L-17	626	VON
1	EA	MULLION STORAGE KIT	MT54	689	VON
2	EA	FSIC RIM CYLINDER	20-057 ICX W/CONST. CORE	626	SCH
1	EA	FSIC MORTISE CYLINDER	20-061 ICX W/CONST. CORE	626	SCH
3	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
2	EA	OH STOP	100S	630	GLY
2	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	SET	SEAL	PERIMETER SEAL BY FRAME MANUFACTURER		
1	SET	ASTRAGAL	MEETING STILE SEAL BY DOOR MFR		

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Hardware Group No. 700CM

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
2	EA	PANIC HARDWARE	99-L-17	626	VON
1	EA	MULLION STORAGE KIT	MT54	689	VON
2	EA	FSIC RIM CYLINDER	20-057 ICX W/CONST. CORE	626	SCH
1	EA	FSIC MORTISE CYLINDER	20-061 ICX W/CONST. CORE	626	SCH
3	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
2	EA	OH STOP	90S	630	GLY
2	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER
1	EA	MULLION SEAL	8780NBK PSA	BK	ZER

Hardware Group No. 700CMR

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE RATED REMOVABLE MULLION	KR9954 STAB	689	VON
2	EA	FIRE EXIT HARDWARE	99-L-F-17	626	VON
1	EA	MULLION STORAGE KIT	MT54	689	VON
2	EA	FSIC RIM CYLINDER	20-057 ICX W/CONST. CORE	626	SCH
1	EA	FSIC MORTISE CYLINDER	20-061 ICX W/CONST. CORE	626	SCH
3	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
2	EA	OH STOP	90S	630	GLY
2	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER
1	EA	MULLION SEAL	8780NBK PSA	BK	ZER

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Hardware Group No. 700M

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
2	EA	PANIC HARDWARE	99-L-17	626	VON
1	EA	MULLION STORAGE KIT	MT54	689	VON
2	EA	FSIC RIM CYLINDER	20-057 ICX W/CONST. CORE	626	SCH
1	EA	FSIC MORTISE CYLINDER	20-061 ICX W/CONST. CORE	626	SCH
3	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
2	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
2	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER
1	EA	MULLION SEAL	8780NBK PSA	BK	ZER

Hardware Group No. 701

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	99-L-17	626	VON
1	EA	FSIC RIM CYLINDER	20-057 ICX W/CONST. CORE	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER

Hardware Group No. 701A

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PIVOT SET	7215 SET	626	IVE
1	EA	INTERMEDIATE PIVOT	7215 INT	626	IVE
1	EA	PANIC HARDWARE	99-L-17	626	VON
1	EA	FSIC RIM CYLINDER	20-057 ICX W/CONST. CORE	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	SET	SEAL	PERIMETER SEAL BY FRAME MANUFACTURER		

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Hardware Group No. 701C

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	99-L-17	626	VON
1	EA	FSIC RIM CYLINDER	20-057 ICX W/CONST. CORE	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER

Hardware Group No. 701R

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	99-L-F-17	626	VON
1	EA	FSIC RIM CYLINDER	20-057 ICX W/CONST. CORE	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J	BK	ZER

Hardware Group No. 704AM

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	PIVOT SET	7215 SET	626	IVE
2	EA	INTERMEDIATE PIVOT	7215 INT	626	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
2	EA	PANIC HARDWARE	LD-99-EO	626	VON
1	EA	MULLION STORAGE KIT	MT54	689	VON
1	EA	FSIC MORTISE CYLINDER	20-061 ICX W/CONST. CORE	626	SCH
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	DOOR PULL	VR910 DT (INACTIVE LEAF)	630	IVE
1	EA	DOOR PULL	VR910 NL	630	IVE
2	EA	SURFACE CLOSER	4040XP SCUSH SRI TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	MULLION SEAL	139N PSA		ZER
1	EA	RAIN DRIP	142AA (OMIT @ COVERED OPENINGS)	AA	ZER
1	SET	SEAL	PERIMETER SEAL BY FRAME MANUFACTURER		
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-226	A	ZER
2	EA	DOOR CONTACT	679-05 AS REQ (BY DIVISION 28 13 00)	WHT	SCE

OPERATIONAL DESCRIPTION: DURING BUSINESS HOURS: DOORS UNLOCKED/LOCKED BY ACCESS CONTROL SYSTEM. AFTER BUSINESS HOURS: DOORS LOCKED. ALWAYS FREE EGRESS. FAIL SECURE.

Hardware Group No. 711C

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PANIC HARDWARE	LD-99-L-NL-17	626	VON
1	EA	FSIC RIM CYLINDER	20-057 ICX W/CONST. CORE	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER

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Hardware Group No. 720AC

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	PIVOT SET	7215 SET	626	IVE
2	EA	INTERMEDIATE PIVOT	7215 INT	626	IVE
2	EA	PANIC HARDWARE	9947-EO-LBR	626	VON
2	EA	OH STOP	100S	630	GLY
2	EA	SURFACE CLOSER	4040XPT DE X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	SET	SEAL	PERIMETER SEAL BY FRAME MANUFACTURER		

Hardware Group No. 721R

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	FIRE EXIT HARDWARE	99-EO-F	626	VON
1	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J	BK	ZER
1	EA	DOOR CONTACT	679-05 AS REQ (BY DIVISION 28 13 00)	WHT	SCE

NOTE: DOOR CONTACT TO MONITOR DOOR. LOCAL ALARM TO SOUND IF DOOR IS OPENED.

Hardware Group No. 738R

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	FIRE RATED REMOVABLE MULLION	KR9954 STAB	689	VON
2	EA	FIRE EXIT HARDWARE	99-L-BE-F-17	626	VON
1	EA	MULLION STORAGE KIT	MT54	689	VON
1	EA	FSIC MORTISE CYLINDER	20-061 ICX W/CONST. CORE	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	FIRE/LIFE CLOSER	4040SE WMS X MTG BRKT,SPCR & PLATE AS REQ	689	LCN
1	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
2	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	FIRE/LIFE WALL MAG	SEM7800 SERIES AS REQ	689	LCN
1	EA	MULLION SEAL	139N PSA		ZER
1	EA	GASKETING	488S PSA H & J	BK	ZER

-PROVIDE 120VAC AND FIRE ALARM CONNECTIONS FOR HOLD OPENS.

-WIRE HOLD OPENS TO THE FIRE ALARM SYSTEM.

-HOLD OPENS ARE TO RELEASE UPON ACTIVATION OF THE FIRE ALARMS SYSTEM.

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Hardware Group No. 738RX

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	FIRE RATED REMOVABLE MULLION	KR9954 STAB	689	VON
2	EA	FIRE EXIT HARDWARE	99-L-BE-F-17	626	VON
1	EA	MULLION STORAGE KIT	MT54	689	VON
1	EA	FSIC MORTISE CYLINDER	20-061 ICX W/CONST. CORE	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
2	EA	SURFACE CLOSER	4040XP EDA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
2	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
2	EA	FIRE/LIFE WALL MAG	SEM7800 SERIES AS REQ	689	LCN
1	EA	MULLION SEAL	139N PSA		ZER
1	EA	GASKETING	488S PSA H & J	BK	ZER

-PROVIDE 120VAC AND FIRE ALARM CONNECTIONS FOR HOLD OPENS.

-WIRE HOLD OPENS TO THE FIRE ALARM SYSTEM.

-HOLD OPENS ARE TO RELEASE UPON ACTIVATION OF THE FIRE ALARMS SYSTEM.

Hardware Group No. 739R

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	FIRE EXIT HARDWARE	99-L-BE-F-17	626	VON
1	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	FIRE/LIFE WALL MAG	SEM7800 SERIES AS REQ	689	LCN
1	EA	GASKETING	488S PSA H & J	BK	ZER

-PROVIDE 120VAC AND FIRE ALARM CONNECTIONS FOR HOLD OPEN.

-WIRE HOLD OPEN TO THE FIRE ALARM SYSTEM.

-HOLD OPEN TO RELEASE UPON ACTIVATION OF THE FIRE ALARMS SYSTEM.

Hardware Group No. 739RW

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5 NRP	630	IVE
1	EA	FIRE EXIT HARDWARE	99-L-BE-F-17	626	VON
1	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	FIRE/LIFE WALL MAG	SEM7800 SERIES AS REQ	689	LCN
1	EA	GASKETING	488S PSA H & J	BK	ZER

-PROVIDE 120VAC AND FIRE ALARM CONNECTIONS FOR HOLD OPEN.

-WIRE HOLD OPEN TO THE FIRE ALARM SYSTEM.

-HOLD OPEN TO RELEASE UPON ACTIVATION OF THE FIRE ALARMS SYSTEM.



Hardware Group No. 770

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	CONST LATCHING BOLT	FB51P/FB61P AS REQ	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	PANIC HARDWARE	9975-L-17	626	VON
1	EA	FSIC RIM CYLINDER	20-057 ICX W/CONST. CORE	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
2	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER
2	EA	MEETING STILE	8193AA (2 PCS - 1 SET) HEIGHT AS REQ (OMIT @ NON-RATED DOORS)	AA	ZER

Hardware Group No. 800V

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
2	EA	DUMMY PUSH BAR	330-996-17	626	VON
2	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
2	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER
2	EA	MEETING STILE	8193AA (2 PCS - 1 SET) HEIGHT AS REQ (OMIT @ NON-RATED DOORS)	AA	ZER

Hardware Group No. 801

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	PULL PLATE	8303 10" 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J	BK	ZER

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Hardware Group No. B700ACM

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	PIVOT SET	7215 SET	643E/71 6	IVE
2	EA	INTERMEDIATE PIVOT	7215 INT	643E/71 6	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB	695	VON
2	EA	PANIC HARDWARE	99-L-17	643E	VON
1	EA	MULLION STORAGE KIT	MT54	695	VON
2	EA	RIM CYLINDER	20-057 ICX W/CONST. CORE	643e	SCH
1	EA	MORTISE CYLINDER	20-061 ICX W/ CONST CORE	643e	SCH
3	EA	FSIC PERMANENT CORE	23-030 VKC	613	SCH
2	EA	OH STOP	100S	643E/71 6	GLY
2	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	695	LCN
1	SET	SEAL	PERIMETER SEAL BY FRAME MANUFACTURER		
1	SET	ASTRAGAL	MEETING STILE SEAL BY DOOR MFR		

Hardware Group No. B700AM

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	PIVOT SET	7215 SET	643E/71 6	IVE
2	EA	INTERMEDIATE PIVOT	7215 INT	643E/71 6	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB	695	VON
2	EA	PANIC HARDWARE	LD-99-EO	643E	VON
1	EA	MULLION STORAGE KIT	MT54	695	VON
2	EA	FSIC RIM CYLINDER	20-057 ICX W/CONST. CORE	626	SCH
1	EA	MORTISE CYLINDER	20-061 ICX W/ CONST CORE	643e	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	613	SCH
2	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	DOOR PULL	VR910 DT	630	IVE
1	EA	DOOR PULL	VR910 NL	630	IVE
2	EA	SURFACE CLOSER	4040XP SCUSH TBSRT X MTG BRKT, SPCR & PLATE AS REQ	695	LCN
1	SET	SEAL	PERIMETER SEAL BY FRAME MANUFACTURER		
1	SET	ASTRAGAL	MEETING STILE SEAL BY DOOR MFR		

Hardware Group No. B704AM

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	PIVOT SET	7215 SET	643E/71 6	IVE
2	EA	INTERMEDIATE PIVOT	7215 INT	643E/71 6	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB	695	VON
2	EA	PANIC HARDWARE	LD-99-EO	643E	VON
1	EA	MULLION STORAGE KIT	MT54	695	VON
1	EA	FSIC RIM CYLINDER	20-057 ICX W/CONST. CORE	626	SCH
1	EA	MORTISE CYLINDER	20-061 ICX W/ CONST CORE	643e	SCH
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	613	SCH
1	EA	DOOR PULL	VR910 DT (INACTIVE LEAF)	630	IVE
1	EA	DOOR PULL	VR910 NL	630	IVE
2	EA	SURFACE CLOSER	4040XP SCUSH SRI TBSRT X MTG BRKT, SPCR & PLATE AS REQ	695	LCN
1	EA	MULLION SEAL	139N PSA		ZER
1	EA	RAIN DRIP	142D	D	ZER
1	SET	SEAL	PERIMETER SEAL BY FRAME MANUFACTURER		
2	EA	DOOR SWEEP	39D	D	ZER
1	EA	THRESHOLD	65D-226	D	ZER
2	EA	DOOR CONTACT	679-05 AS REQ (BY DIVISION 28 13 00)	WHT	SCE

OPERATIONAL DESCRIPTION: DURING BUSINESS HOURS: DOORS UNLOCKED/LOCKED BY ACCESS CONTROL SYSTEM. AFTER BUSINESS HOURS: DOORS LOCKED. ALWAYS FREE EGRESS. FAIL SECURE.

Hardware Group No. BD800A

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	PIVOT SET	7215 SET	643E/71 6	IVE
2	EA	INTERMEDIATE PIVOT	7215 INT	643E/71 6	IVE
2	EA	DUMMY PUSH BAR	330	643E	VON
1	EA	DOOR PULL	VR910 DT	630	IVE
1	EA	DOOR PULL	VR910 NL	630	IVE
2	EA	SURFACE CLOSER	4040XP SCUSH SRI TBSRT X MTG BRKT, SPCR & PLATE AS REQ	695	LCN
1	SET	SEAL	PERIMETER SEAL BY FRAME MANUFACTURER		
1	SET	ASTRAGAL	MEETING STILE SEAL BY DOOR MFR		
2	EA	DOOR CONTACT	679-05 AS REQ (BY DIVISION 28 13 00)	WHT	SCE

Hardware Group No. C001

PROVIDE EACH RU DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	FSIC MORTISE CYLINDER	20-061 ICX W/CONST. CORE	626	SCH
2	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
2	EA	KEY SWITCH	653-0505 L2 12/24 VDC	630	SCE
1	EA	HARDWARE	REMAINDER OF HARDWARE BY DOOR MFG	FBO	UNK

COORDINATE LOCKING REQUIREMENTS WITH DOOR MANUFACTURER.

Hardware Group No. C201

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC CLASSROOM LOCK	AD-300-CY-70-MTK-SPA-JD-K510- 066 (BY DIVISION 28 13 00)	626	SCE
1	EA	FSIC CONST. CORE	23-030 ICX (FOR AD300 TRIM)	622	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER
1	EA	POWER SUPPLY	PS902 BBK 900-2RS (BY DIVISION 28 13 00)	LGR	SCE

OPERATIONAL DESCRIPTION: ENTRANCE BY CREDENTIAL READER OR MANUAL KEY OVER-RIDE.  
ALWAYS FREE EGRESS. FAIL SECURE.

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Hardware Group No. C201C

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC CLASSROOM LOCK	AD-300-CY-70-MTK-SPA-JD-K510-066 (BY DIVISION 28 13 00)	626	SCE
1	EA	FSIC CONST. CORE	23-030 ICX (FOR AD300 TRIM)	622	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS)	BK	ZER
1	EA	POWER SUPPLY	PS902 BBK 900-2RS (BY DIVISION 28 13 00)	LGR	SCE

OPERATIONAL DESCRIPTION: ENTRANCE BY CREDENTIAL READER OR MANUAL KEY OVER-RIDE.  
ALWAYS FREE EGRESS. FAIL SECURE.

Hardware Group No. C205

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC CLASSROOM LOCK	AD-300-CY-70-MTK-SPA-JD-K510-066 (BY DIVISION 28 13 00)	626	SCE
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
1	EA	FSIC CONST. CORE	23-030 ICX (FOR AD300 TRIM)	622	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH SRI TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA (OMIT @ COVERED OPENINGS)	AA	ZER
1	EA	GASKETING SET	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-226	A	ZER
1	EA	POWER SUPPLY	PS902 BBK 900-2RS (BY DIVISION 28 13 00)	LGR	SCE

OPERATIONAL DESCRIPTION: ENTRANCE BY CREDENTIAL READER OR MANUAL KEY OVER-RIDE.  
ALWAYS FREE EGRESS. FAIL SECURE.

Hardware Group No. C205IW

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5	630	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC CLASSROOM LOCK	AD-300-CY-70-MTK-SPA-JD-K510-066 (BY DIVISION 28 13 00)	626	SCE
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
1	EA	FSIC CONST. CORE	23-030 ICX (FOR AD300 TRIM)	622	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
1	EA	RAIN DRIP	142AA (OMIT @ COVERED OPENINGS)	AA	ZER
1	EA	GASKETING SET	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-226	A	ZER
1	EA	POWER SUPPLY	PS902 BBK 900-2RS (BY DIVISION 28 13 00)	LGR	SCE

OPERATIONAL DESCRIPTION: ENTRANCE BY CREDENTIAL READER OR MANUAL KEY OVER-RIDE. ALWAYS FREE EGRESS. FAIL SECURE.

Hardware Group No. C205W

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5 NRP	630	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC CLASSROOM LOCK	AD-300-CY-70-MTK-SPA-JD-K510-066 (BY DIVISION 28 13 00)	626	SCE
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
1	EA	FSIC CONST. CORE	23-030 ICX (FOR AD300 TRIM)	622	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH SRI TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA (OMIT @ COVERED OPENINGS)	AA	ZER
1	EA	GASKETING SET	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-226	A	ZER
1	EA	POWER SUPPLY	PS902 BBK 900-2RS (BY DIVISION 28 13 00)	LGR	SCE

OPERATIONAL DESCRIPTION: ENTRANCE BY CREDENTIAL READER OR MANUAL KEY OVER-RIDE. ALWAYS FREE EGRESS. FAIL SECURE.

Hardware Group No. C214

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
2	EA	MANUAL FLUSH BOLT	FB458-12"	626	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	ELEC CLASSROOM LOCK	AD-300-CY-70-MTK-SPA-JD-K510-066 (BY DIVISION 28 13 00)	626	SCE
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
1	EA	OH STOP	90S	630	GLY
1	EA	SURFACE CLOSER	4040XP SCUSH SRI TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
2	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA (OMIT @ COVERED OPENINGS)	AA	ZER
2	SET	GASKETING SET	328AA-S H & J	AA	ZER
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	HD THRESHOLD	655A-V3-226	A	ZER
1	EA	POWER SUPPLY	PS904 BBK 900-4RL (BY DIVISION 28 13 00)	LGR	SCE

OPERATIONAL DESCRIPTION: ENTRANCE BY CREDENTIAL READER OR MANUAL KEY OVER-RIDE. ALWAYS FREE EGRESS. FAIL SECURE.

Hardware Group No. C701A

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PIVOT SET	7215 SET	626	IVE
1	EA	INTERMEDIATE PIVOT	7215 INT	626	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	PANIC HARDWARE	LD-99-EO	626	VON
1	EA	ELEC EXIT DEVICE TRIM	AD-300-993R-70-MTK-SPA-JD (BY DIVISION 28 13 00)	626	SCE
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
1	EA	FSIC CONST. CORE	23-030 ICX (FOR AD300 TRIM) (FOR AD300 TRIM)	622	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	SET	SEAL	PERIMETER SEAL BY FRAME MANUFACTURER		
1	EA	POWER SUPPLY	PS902 BBK 900-2RS (BY DIVISION 28 13 00)	LGR	SCE

OPERATIONAL DESCRIPTION: ENTRANCE BY CREDENTIAL READER OR MANUAL KEY OVER-RIDE. ALWAYS FREE EGRESS. FAIL SECURE.

Hardware Group No. C704AM

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	PIVOT SET	7215 SET	626	IVE
2	EA	INTERMEDIATE PIVOT	7215 INT	626	IVE
2	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
1	EA	PANIC HARDWARE	LD-99-EO	626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-99-EO-CON	626	VON
1	EA	MULLION STORAGE KIT	MT54	689	VON
1	EA	ELEC EXIT DEVICE TRIM	AD-300-993R-70-MTK-SPA-JD (BY DIVISION 28 13 00)	626	SCE
1	EA	FSIC MORTISE CYLINDER	20-061 ICX W/CONST. CORE	626	SCH
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
1	EA	FSIC CONST. CORE	23-030 ICX (FOR AD300 TRIM)	622	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	DOOR PULL	VR910 DT (INACTIVE LEAF)	630	IVE
2	EA	SURFACE CLOSER	4040XP SCUSH SRI TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	MULLION SEAL	139N PSA		ZER
1	EA	RAIN DRIP	142AA (OMIT @ COVERED OPENINGS)	AA	ZER
1	SET	SEAL	PERIMETER SEAL BY FRAME MANUFACTURER		
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-226	A	ZER
1	EA	POWER SUPPLY	PS904 BBK 900-4RL (BY DIVISION 28 13 00)	LGR	SCE

INSTALLATION NOTES: WIRE RX SWITCH IN INACTIVE LEAF AROUND FRAME, THROUGH EPT'S TO HEAD OF AD300 ON ACTIVE LEAF FOR AUTHORIZED EGRESS SIGNAL.

OPERATIONAL DESCRIPTION: ENTRANCE BY CREDENTIAL READER OR MANUAL KEY OVER-RIDE. RX SWITCH IN EXIT ON INACTIVE LEAF TO SIGNAL AUTHORIZED EGRESS. ALWAYS FREE EGRESS. FAIL SECURE.



Hardware Group No. C704M

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
2	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
1	EA	PANIC HARDWARE	LD-99-EO	626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-99-EO-CON	626	VON
1	EA	MULLION STORAGE KIT	MT54	689	VON
1	EA	ELEC EXIT DEVICE TRIM	AD-300-993R-70-MTK-SPA-JD (BY DIVISION 28 13 00)	626	SCE
1	EA	FSIC MORTISE CYLINDER	20-061 ICX W/CONST. CORE	626	SCH
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
1	EA	FSIC CONST. CORE	23-030 ICX (FOR AD300 TRIM)	622	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	DOOR PULL	VR910 DT	630	IVE
2	EA	SURFACE CLOSER	4040XP SCUSH SRI TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
2	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	MULLION SEAL	139N PSA		ZER
1	EA	RAIN DRIP	142AA (OMIT @ COVERED OPENINGS)	AA	ZER
2	SET	GASKETING SET	328AA-S H & J	AA	ZER
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	HD THRESHOLD	655A-V3-226	A	ZER
1	EA	POWER SUPPLY	PS904 BBK 900-4RL (BY DIVISION 28 13 00)	LGR	SCE

INSTALLATION NOTES: WIRE RX SWITCH IN INACTIVE LEAF AROUND FRAME, THROUGH EPT'S TO HEAD OF AD300 ON ACTIVE LEAF FOR AUTHORIZED EGRESS SIGNAL.

OPERATIONAL DESCRIPTION: ENTRANCE BY CREDENTIAL READER OR MANUAL KEY OVER-RIDE. RX SWITCH IN EXIT ON INACTIVE LEAF TO SIGNAL AUTHORIZED EGRESS. ALWAYS FREE EGRESS. FAIL SECURE.

Hardware Group No. C704MV

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
2	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
1	EA	PANIC HARDWARE	LD-99-EO	626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-99-EO-CON	626	VON
1	EA	MULLION STORAGE KIT	MT54	689	VON
1	EA	ELEC EXIT DEVICE TRIM	AD-300-993R-70-MTK-SPA-JD (BY DIVISION 28 13 00)	626	SCE
1	EA	FSIC MORTISE CYLINDER	20-061 ICX W/CONST. CORE	626	SCH
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
1	EA	FSIC CONST. CORE	23-030 ICX (FOR AD300 TRIM)	622	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	DOOR PULL	VR910 DT	630	IVE
2	EA	SURFACE CLOSER	4040XP SCUSH SRI TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
2	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	MULLION SEAL	139N PSA		ZER
1	EA	RAIN DRIP	142AA (OMIT @ COVERED OPENINGS)	AA	ZER
2	SET	GASKETING SET	328AA-S H & J	AA	ZER
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	HD THRESHOLD	655A-V3-226	A	ZER
1	EA	VIEWER	698	626	IVE
1	EA	POWER SUPPLY	PS904 BBK 900-4RL (BY DIVISION 28 13 00)	LGR	SCE

INSTALLATION NOTES: WIRE RX SWITCH IN INACTIVE LEAF AROUND FRAME, THROUGH EPT'S TO HEAD OF AD300 ON ACTIVE LEAF FOR AUTHORIZED EGRESS SIGNAL.

OPERATIONAL DESCRIPTION: ENTRANCE BY CREDENTIAL READER OR MANUAL KEY OVER-RIDE. RX SWITCH IN EXIT ON INACTIVE LEAF TO SIGNAL AUTHORIZED EGRESS. ALWAYS FREE EGRESS. FAIL SECURE.

Hardware Group No. C705

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	PANIC HARDWARE	LD-99-EO	626	VON
1	EA	ELEC EXIT DEVICE TRIM	AD-300-993R-70-MTK-SPA-JD (BY DIVISION 28 13 00)	626	SCE
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
1	EA	FSIC CONST. CORE	23-030 ICX (FOR AD300 TRIM)	622	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH SRI TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA (OMIT @ COVERED OPENINGS)	AA	ZER
1	EA	GASKETING SET	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-226	A	ZER
1	EA	POWER SUPPLY	PS902 BBK 900-2RS (BY DIVISION 28 13 00)	LGR	SCE

OPERATIONAL DESCRIPTION: ENTRANCE BY CREDENTIAL READER (FURNISHED BY DIVISION 28 13 00) OR MANUAL KEY OVER-RIDE. ALWAYS FREE EGRESS. FAIL SECURE.

Hardware Group No. C705W

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5 NRP	630	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	PANIC HARDWARE	LD-99-EO	626	VON
1	EA	ELEC EXIT DEVICE TRIM	AD-300-993R-70-MTK-SPA-JD (BY DIVISION 28 13 00)	626	SCE
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
1	EA	FSIC CONST. CORE	23-030 ICX (FOR AD300 TRIM)	622	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH SRI TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA (OMIT @ COVERED OPENINGS)	AA	ZER
1	EA	GASKETING SET	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-226	A	ZER
1	EA	POWER SUPPLY	PS902 BBK 900-2RS (BY DIVISION 28 13 00)	LGR	SCE

OPERATIONAL DESCRIPTION: ENTRANCE BY CREDENTIAL READER (FURNISHED BY DIVISION 28 13 00) OR MANUAL KEY OVER-RIDE. ALWAYS FREE EGRESS. FAIL SECURE.

Hardware Group No. C715A

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PIVOT SET	7215 SET	626	IVE
1	EA	INTERMEDIATE PIVOT	7215 INT	626	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	PANIC HARDWARE	LD-99-EO	626	VON
1	EA	ELEC EXIT DEVICE TRIM	AD-300-993R-70-MTK-SPA-JD (BY DIVISION 28 13 00)	626	SCE
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
1	EA	FSIC CONST. CORE	23-030 ICX (FOR AD300 TRIM) (FOR AD300 TRIM)	622	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH SRI TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	RAIN DRIP	142AA (OMIT @ COVERED OPENINGS)	AA	ZER
1	SET	SEAL	PERIMETER SEAL BY FRAME MANUFACTURER		
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-226	A	ZER
1	EA	POWER SUPPLY	PS902 BBK 900-2RS (BY DIVISION 28 13 00)	LGR	SCE

OPERATIONAL DESCRIPTION: ENTRANCE BY CREDENTIAL READER OR MANUAL KEY OVER-RIDE.  
ALWAYS FREE EGRESS. FAIL SECURE.

Hardware Group No. CB704AM

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	PIVOT SET	7215 SET	643E/71 6	IVE
2	EA	INTERMEDIATE PIVOT	7215 INT	643E/71 6	IVE
2	EA	POWER TRANSFER	EPT10 CON	695	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	695	VON
1	EA	PANIC HARDWARE	LD-99-EO	643E	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-99-EO-CON 24 VDC	643E	VON
1	EA	MULLION STORAGE KIT	MT54	695	VON
1	EA	ELEC EXIT DEVICE TRIM	AD-300-993R-70-MTK-SPA-JD (BY DIVISION 28 13 00)	626	SCE
1	EA	MORTISE CYLINDER	20-061 ICX W/ CONST CORE	643e	SCH
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
1	EA	FSIC CONST. CORE	23-030 ICX (FOR AD300 TRIM)	622	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	613	SCH
1	EA	DOOR PULL	VR910 DT (INACTIVE LEAF)	630	IVE
2	EA	SURFACE CLOSER	4040XP SCUSH SRI TBSRT X MTG BRKT, SPCR & PLATE AS REQ	695	LCN
1	EA	MULLION SEAL	139N PSA		ZER
1	EA	RAIN DRIP	142D	D	ZER
1	SET	SEAL	PERIMETER SEAL BY FRAME MANUFACTURER		
2	EA	DOOR SWEEP	39D	D	ZER
1	EA	THRESHOLD	65D-226	D	ZER
1	EA	POWER SUPPLY	PS904 BBK 900-4RL (BY DIVISION 28 13 00)	LGR	SCE

INSTALLATION NOTES: WIRE RX SWITCH IN INACTIVE LEAF AROUND FRAME, THROUGH EPT'S TO HEAD OF AD300 ON ACTIVE LEAF FOR AUTHORIZED EGRESS SIGNAL.

OPERATIONAL DESCRIPTION: ENTRANCE BY CREDENTIAL READER OR MANUAL KEY OVER-RIDE. RX SWITCH IN EXIT ON INACTIVE LEAF TO SIGNAL AUTHORIZED EGRESS. ALWAYS FREE EGRESS. FAIL SECURE.

Hardware Group No. CR201AC

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PIVOT SET	7215 SET	643E/71 6	IVE
1	EA	INTERMEDIATE PIVOT	7215 INT	643E/71 6	IVE
1	EA	POWER TRANSFER	EPT10 CON	695	VON
1	EA	ELEC CLASSROOM LOCK	AD-300-CY-70-MTK-SPA-JD-K510-066 (BY DIVISION 28 13 00)	643e	SCE
1	EA	FSIC CONST. CORE	23-030 ICX (FOR AD300 TRIM)	622	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	613	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT X MTG BRKT, SPCR & PLATE AS REQ	695	LCN
1	EA	FLOOR STOP	FS448	643E/71 6	IVE
1	SET	SEAL	PERIMETER SEAL BY FRAME MANUFACTURER		
1	EA	REMOTE RELEASE BUTTON	BY DIVISION 28 13 00	628	SCE
1	EA	POWER SUPPLY	PS902 BBK 900-2RS (BY DIVISION 28 13 00)	LGR	SCE

OPERATIONAL DESCRIPTION: ENTRANCE BY CREDENTIAL READER OR MANUAL KEY OVER-RIDE.  
REMOTE CONTROL BY ACCESS CONTROL SYSTEM OR DESK BUTTON RELEASE AT RECEPTION.  
ALWAYS FREE EGRESS. FAIL SECURE.

Hardware Group No. CR700AM

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	PIVOT SET	7215 SET	643E/71 6	IVE
2	EA	INTERMEDIATE PIVOT	7215 INT	643E/71 6	IVE
2	EA	POWER TRANSFER	EPT10 CON	695	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	695	VON
1	EA	ELEC PANIC HARDWARE	LD-RX-99-EO	643E	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-99-EO-CON 24 VDC	643E	VON
1	EA	MULLION STORAGE KIT	MT54	695	VON
1	EA	ELEC EXIT DEVICE TRIM	AD-300-993R-70-MTK-SPA-JD (BY DIVISION 28 13 00)	643e	SCE
1	EA	MORTISE CYLINDER	20-061 ICX W/ CONST CORE	643e	SCH
1	EA	FSIC CONST. CORE	23-030 ICX (FOR AD300 TRIM)	622	SCH
2	EA	FSIC PERMANENT CORE	23-030 VKC	613	SCH
1	EA	DOOR PULL	VR910 DT	630	IVE
2	EA	SURFACE CLOSER	4040XP SCUSH TBSRT X MTG BRKT, SPCR & PLATE AS REQ	695	LCN
1	EA	MULLION SEAL	139N PSA		ZER
1	SET	SEAL	PERIMETER SEAL BY FRAME MANUFACTURER		
1	EA	REMOTE RELEASE BUTTON	BY DIVISION 28 13 00	628	SCE
1	EA	POWER SUPPLY	PS904 BBK 900-4RL (BY DIVISION 28 13 00)	LGR	SCE

OPERATIONAL DESCRIPTION: ENTRANCE BY CREDENTIAL READER OR MANUAL KEY OVER-RIDE.  
REMOTE CONTROL BY ACCESS CONTROL SYSTEM OR DESK BUTTON RELEASE AT RECEPTION.  
ALWAYS FREE EGRESS. FAIL SECURE.

Hardware Group No. CR704AM

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	PIVOT SET	7215 SET	643E/71 6	IVE
2	EA	INTERMEDIATE PIVOT	7215 INT	643E/71 6	IVE
2	EA	POWER TRANSFER	EPT10 CON	695	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	695	VON
1	EA	PANIC HARDWARE	LD-99-EO	643E	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-99-EO-CON 24 VDC	643E	VON
1	EA	MULLION STORAGE KIT	MT54	695	VON
1	EA	ELEC EXIT DEVICE TRIM	AD-300-993R-70-MTK-SPA-JD (BY DIVISION 28 13 00)	643e	SCE
1	EA	MORTISE CYLINDER	20-061 ICX W/ CONST CORE	643e	SCH
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
1	EA	FSIC CONST. CORE	23-030 ICX (FOR AD300 TRIM)	622	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	613	SCH
1	EA	DOOR PULL	VR910 DT (INACTIVE LEAF)	630	IVE
2	EA	SURFACE CLOSER	4040XP SCUSH SRI TBSRT X MTG BRKT, SPCR & PLATE AS REQ	695	LCN
1	EA	MULLION SEAL	139N PSA		ZER
1	EA	RAIN DRIP	142D	D	ZER
1	SET	SEAL	PERIMETER SEAL BY FRAME MANUFACTURER		
2	EA	DOOR SWEEP	39D	D	ZER
1	EA	THRESHOLD	65D-226	D	ZER
1	EA	REMOTE RELEASE BUTTON	BY DIVISION 28 13 00	628	SCE
1	EA	POWER SUPPLY	PS904 BBK 900-4RL (BY DIVISION 28 13 00)	LGR	SCE

INSTALLATION NOTES: WIRE RX SWITCH IN INACTIVE LEAF AROUND FRAME, THROUGH EPT'S TO HEAD OF AD300 ON ACTIVE LEAF FOR AUTHORIZED EGRESS SIGNAL.

OPERATIONAL DESCRIPTION: ENTRANCE BY CREDENTIAL READER, REMOTE RELEASE FROM RECEPTION OR MANUAL KEY OVER-RIDE. RX SWITCH IN EXIT ON INACTIVE LEAF TO SIGNAL AUTHORIZED EGRESS. ALWAYS FREE EGRESS. FAIL SECURE.



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Hardware Group No. D205

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	STOREROOM LOCK	ND80TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH SRI TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA (OMIT @ COVERED OPENINGS)	AA	ZER
1	EA	GASKETING SET	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-226	A	ZER
1	EA	DOOR CONTACT	679-05 AS REQ (BY DIVISION 28 13 00)	WHT	SCE

Hardware Group No. D205W

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 5 X 4.5 NRP	630	IVE
1	EA	STOREROOM LOCK	ND80TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH SRI TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA (OMIT @ COVERED OPENINGS)	AA	ZER
1	EA	GASKETING SET	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-226	A	ZER
1	EA	DOOR CONTACT	679-05 AS REQ (BY DIVISION 28 13 00)	WHT	SCE

Hardware Group No. D214

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
2	EA	MANUAL FLUSH BOLT	FB458-12"	626	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM LOCK	ND80TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
1	EA	OH STOP	90S	630	GLY
1	EA	SURFACE CLOSER	4040XP EDA SRI TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
2	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	MULLION SEAL	139N PSA		ZER
1	EA	RAIN DRIP	142AA	AA	ZER
			(OMIT @ COVERED OPENINGS)		
2	SET	GASKETING SET	328AA-S H & J	AA	ZER
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	HD THRESHOLD	655A-V3-226	A	ZER
2	EA	DOOR CONTACT	679-05 AS REQ (BY DIVISION 28 13 00)	WHT	SCE

Hardware Group No. D725

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	PANIC HARDWARE	LD-99-EO	626	VON
1	EA	SURFACE CLOSER	4040XP SCUSH SRI TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
			(OMIT @ COVERED OPENINGS)		
1	EA	GASKETING SET	188SBK PSA	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-226	A	ZER
1	EA	DOOR CONTACT	679-05 AS REQ (BY DIVISION 28 13 00)	WHT	SCE

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Hardware Group No. DJ704

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	GATE HINGE/CLOSER	BY GATE MANUFACTURER		B/O
1	EA	CENTER POST	BY GATE SUPPLIER		
1	EA	PANIC HARDWARE	LD-99-EO-WH	628	VON
1	EA	PANIC HARDWARE	LD-99-L-17-WH	628	VON
1	EA	FSIC RIM CYLINDER	20-057 ICX W/CONST. CORE	626	SCH
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
2	EA	DOOR CONTACT	679-05 AS REQ (BY DIVISION 28 13 00)	WHT	SCE

- COORDINATE ALL HARDWARE WITH THE GATE MFR. PRIOR TO SUBMITTALS
- ALL REMAINING HARDWARE BY GATE MFR. (HINGES, CLOSER, PLATES, ETC.)
- 1EA 3/4" MOUNTING PLATE FOR EXIT DEVICE
- PROVIDE PLATE OR MESH ON GATE TO PREVENT INDIVIDUALS FROM REACHING IN AND OPENING THE GATE FROM SECURE SIDE.
- EGRESS BY THE PUSH PADS.

Hardware Group No. DJ705

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	GATE HINGE/CLOSER	BY GATE MANUFACTURER		B/O
1	EA	PANIC HARDWARE	LD-99-L-17-WH	626	VON
1	EA	FSIC RIM CYLINDER	20-057 ICX W/CONST. CORE	626	SCH
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
1	EA	DOOR CONTACT	679-05 AS REQ (BY DIVISION 28 13 00)	WHT	SCE

- COORDINATE ALL HARDWARE WITH THE GATE MFR. PRIOR TO SUBMITTALS
- ALL REMAINING HARDWARE BY GATE MFR. (HINGES, CLOSER, PLATES, ETC.)
- 1EA 3/4" MOUNTING PLATE FOR EXIT DEVICE
- PROVIDE PLATE OR MESH ON GATE TO PREVENT INDIVIDUALS FROM REACHING IN AND OPENING THE GATE FROM SECURE SIDE.
- EGRESS BY THE PUSH PADS.

Hardware Group No. J001

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
			ALL HARDWARE BY GATE MNFR		B/O

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Hardware Group No. J704

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	GATE HINGE/CLOSER	BY GATE MANUFACTURER		B/O
1	EA	CENTER POST	BY GATE SUPPLIER		
1	EA	PANIC HARDWARE	LD-99-EO-WH	628	VON
1	EA	PANIC HARDWARE	LD-99-L-17-WH	628	VON
1	EA	FSIC RIM CYLINDER	20-057 ICX W/CONST. CORE	626	SCH
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH

- COORDINATE ALL HARDWARE WITH THE GATE MFR. PRIOR TO SUBMITTALS
- ALL REMAINING HARDWARE BY GATE MFR. (HINGES, CLOSER, PLATES, ETC.)
- 1EA 3/4" MOUNTING PLATE FOR EXIT DEVICE
- PROVIDE PLATE OR MESH ON GATE TO PREVENT INDIVIDUALS FROM REACHING IN AND OPENING THE GATE FROM SECURE SIDE.
- EGRESS BY THE PUSH PADS.

Hardware Group No. J705

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	GATE HINGE/CLOSER	BY GATE MANUFACTURER		B/O
1	EA	PANIC HARDWARE	LD-99-L-17-WH	626	VON
1	EA	FSIC RIM CYLINDER	20-057 ICX W/CONST. CORE	626	SCH
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH

- COORDINATE ALL HARDWARE WITH THE GATE MFR. PRIOR TO SUBMITTALS
- ALL REMAINING HARDWARE BY GATE MFR. (HINGES, CLOSER, PLATES, ETC.)
- 1EA 3/4" MOUNTING PLATE FOR EXIT DEVICE
- PROVIDE PLATE OR MESH ON GATE TO PREVENT INDIVIDUALS FROM REACHING IN AND OPENING THE GATE FROM SECURE SIDE.
- EGRESS BY THE PUSH PADS.

Hardware Group No. S403

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PASSAGE SET	ND10S SPA K510-066	626	SCH
1	EA	DOOR STOP	FS448/ WS401CCV AS REQ	626	IVE
		NOTE	BALANCE OF HARDWARE PROVIDED BY STC DOOR MFR		

**\*\*HARDWARE SET IS A GUIDELINE\*\***

- VERIFY AND COORDINATE ALL HARDWARE WITH DOOR/FRAME MANUFACTURER PRIOR TO SUBMITTALS.
- A STANDARD STC UNIT IS SUPPLIED WITH NECESSARY HINGES, PERIMETER GASKETING AND RETAINER, DOOR BOTTOM, LOOSE STOPS, STOP OFFSET HARDWARE BRACKETS AND ALL REQUIRED FASTENERS.

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Hardware Group No. S501

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CLASSROOM LOCK	ND70TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	DOOR STOP NOTE	FS448/ WS401CCV AS REQ BALANCE OF HARDWARE PROVIDED BY STC DOOR MFR	626	IVE

**\*\*HARDWARE SET IS A GUIDELINE\*\***

-VERIFY AND COORDINATE ALL HARDWARE WITH DOOR/FRAME MANUFACTURER PRIOR TO SUBMITTALS.

-A STANDARD STC UNIT IS SUPPLIED WITH NECESSARY HINGES, PERIMETER GASKETING AND RETAINER, DOOR BOTTOM, LOOSE STOPS, STOP OFFSET HARDWARE BRACKETS AND ALL REQUIRED FASTENERS.

Hardware Group No. S501E

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CLASSROOM LOCK	ND70TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	DOOR STOP NOTE	FS448/ WS401CCV AS REQ BALANCE OF HARDWARE PROVIDED BY STC DOOR MFR	626	IVE

**\*\*HARDWARE SET IS A GUIDELINE\*\***

-VERIFY AND COORDINATE ALL HARDWARE WITH DOOR/FRAME MANUFACTURER PRIOR TO SUBMITTALS.

-A STANDARD STC UNIT IS SUPPLIED WITH NECESSARY HINGES, PERIMETER GASKETING AND RETAINER, DOOR BOTTOM, LOOSE STOPS, STOP OFFSET HARDWARE BRACKETS AND ALL REQUIRED FASTENERS.

Hardware Group No. S503

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CLASSROOM LOCK	ND70TD SPA K510-066	626	SCH
1	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
1	EA	DOOR STOP NOTE	FS448/ WS401CCV AS REQ BALANCE OF HARDWARE PROVIDED BY STC DOOR MFR	626	IVE

**\*\*HARDWARE SET IS A GUIDELINE\*\***

-VERIFY AND COORDINATE ALL HARDWARE WITH DOOR/FRAME MANUFACTURER PRIOR TO SUBMITTALS.

-A STANDARD STC UNIT IS SUPPLIED WITH NECESSARY HINGES, PERIMETER GASKETING AND RETAINER, DOOR BOTTOM, LOOSE STOPS, STOP OFFSET HARDWARE BRACKETS AND ALL REQUIRED FASTENERS.

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Hardware Group No. S700M

PROVIDE EACH PR DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
2	EA	PANIC HARDWARE	99-L-17	626	VON
1	EA	MULLION STORAGE KIT	MT54	689	VON
2	EA	FSIC RIM CYLINDER	20-057 ICX W/CONST. CORE	626	SCH
1	EA	FSIC MORTISE CYLINDER	20-061 ICX W/CONST. CORE	626	SCH
3	EA	FSIC PERMANENT CORE	23-030 VKC	626	SCH
2	EA	SURFACE CLOSER	4040XP RW/PA TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
2	EA	DOOR STOP NOTE	FS448/ WS401CCV AS REQ BALANCE OF HARDWARE PROVIDED BY STC DOOR MFR	626	IVE

**\*\*HARDWARE SET IS A GUIDELINE\*\***

-VERIFY AND COORDINATE ALL HARDWARE WITH DOOR/FRAME MANUFACTURER PRIOR TO SUBMITTALS.

-A STANDARD STC UNIT IS SUPPLIED WITH NECESSARY HINGES, PERIMETER GASKETING AND RETAINER, DOOR BOTTOM, LOOSE STOPS, STOP OFFSET HARDWARE BRACKETS AND ALL REQUIRED FASTENERS.

Hardware Group No. S701

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PANIC HARDWARE	99-L-17	626	VON
1	EA	FSIC RIM CYLINDER	20-057 ICX W/CONST. CORE	626	SCH
1	EA	FSIC PERMANENT CORE (EXT CORE)	20-740-XP	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA SRI TBSRT X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	DOOR STOP NOTE	FS448/ WS401CCV AS REQ BALANCE OF HARDWARE PROVIDED BY STC DOOR MFR	626	IVE

**\*\*HARDWARE SET IS A GUIDELINE\*\***

-VERIFY AND COORDINATE ALL HARDWARE WITH DOOR/FRAME MANUFACTURER PRIOR TO SUBMITTALS.

-A STANDARD STC UNIT IS SUPPLIED WITH NECESSARY HINGES, PERIMETER GASKETING AND RETAINER, DOOR BOTTOM, LOOSE STOPS, STOP OFFSET HARDWARE BRACKETS AND ALL REQUIRED FASTENERS.

END OF SECTION

**SECTION 08 8000  
GLAZING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Insulated glass units.
- B. Glazing units.
- C. Glazing compounds.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 9200 - Joint Sealants: Sealants for other than glazing purposes.
- B. Section 08 1113 - Hollow Metal Doors and Frames: Glazed lites in doors and borrowed lites.
- C. Section 08 1416 - Flush Wood Doors: Glazed lites in doors.
- D. Section 08 4313 - Aluminum-Framed Storefronts: Glazing provided as part of storefront assembly.
- E. Section 08 4413 - Glazed Aluminum Curtain Walls: Glazing provided as part of wall assembly.
- F. Section 08 8300 - Mirrors.
- G. Section 08 8723 - Security Films.
- H. Section 08 8813 - Fire-Rated Glazing.
- I. Section 08 8856-Security Glazing.

**1.03 REFERENCE STANDARDS**

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials current edition.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test 2015.
- C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.
- D. ASTM C1036 - Standard Specification for Flat Glass 2016.
- E. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass 2018.
- F. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass 2014.
- G. ASTM C1193 - Standard Guide for Use of Joint Sealants 2016.
- H. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass 2015.
- I. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings 2016.
- J. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes 2017.
- K. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation 2010.
- L. FTD-SA - Filti Testing and Development Shooter Attack Certification. Current Edition.
- M. GANA (GM) - GANA Glazing Manual 2008.
- N. GANA (SM) - GANA Sealant Manual 2008.
- O. GANA (LGRM) - Laminated Glazing Reference Manual 2019.
- P. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use 1990 (2016).
- Q. NFRC 100 - Procedure for Determining Fenestration Product U-factors 2017.

- R. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence 2014, with Errata (2017).
- S. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems 2017.
- T. UL 972 - Standard for Burglary Resisting Glazing Material Current Edition, Including All Revisions.

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by each of the affected installers.

#### **1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data on Insulating Glass Unit, Glazing Unit, and Plastic Film Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
- C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
- D. Samples: Submit two samples 4 by 6 inch in size of glass units.
- E. Certificate: Certify that products of this section meet or exceed specified requirements.
- F. Manufacturer's qualification statement.
- G. Installer's qualification statement.
- H. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

#### **1.06 QUALITY ASSURANCE**

- A. Perform Work in accordance with GANA (GM), GANA (SM), GANA (LGRM), and IGMA TM-3000 for glazing installation methods.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.
  - 1. Provide certified glass products through ANSI accredited certifications that include plant audits and independent laboratory performance testing.
    - a. Insulating Glass Certification Council (IGCC).
    - b. Safety Glazing Certification Council (SGCC).
- C. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years documented experience and approved by manufacturer.

#### **1.07 MOCK-UPS**

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Provide on-site glazing mock-up with the specified glazing components.
- C. Locate where directed.
- D. Mock-ups may remain as part of the Work.

#### **1.08 FIELD CONDITIONS**

- A. Do not install glazing when ambient temperature is less than 40 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

#### **1.09 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.



- B. Insulating Glass Units: Provide a ten (10) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.
- C. Laminated Glass: Provide a ten (10) year manufacturer warranty to include coverage for delamination, including providing products to replace failed units.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Glass Fabricators:
  - 1. Viracon, Inc: [www.viracon.com/#sle](http://www.viracon.com/#sle).
  - 2. Other Fabricators as approved by the Float Glass Manufacturer.
  - 3. Substitutions: See Section 01 6000 - Product Requirements.
- B. Float Glass Manufacturers:
  - 1. AGC Glass North America, Inc: [www.agcglass.com/#sle](http://www.agcglass.com/#sle).
  - 2. Guardian Glass, LLC: [www.guardianglass.com/#sle](http://www.guardianglass.com/#sle).
  - 3. Oldcastle BuildingEnvelope: [www.obe.com](http://www.obe.com).
  - 4. Pilkington North America Inc: [www.pilkington.com/na/#sle](http://www.pilkington.com/na/#sle).
  - 5. Saint Gobain North America: [www.saint-gobain.com/#sle](http://www.saint-gobain.com/#sle).
  - 6. Vitro Architectural Glass (formerly PPG Glass): [www.vitroglazings.com/#sle](http://www.vitroglazings.com/#sle).
  - 7. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES**

- A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
  - 1. Design Pressure: Calculated in accordance with applicable codes.
  - 2. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
  - 3. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
  - 4. Glass thicknesses listed are minimum. Deflection shall be no greater than the thickness of the glass. Final glazing thickness shall comply with all specification reference standards and glazing manufacturer recommendations for span width and height of each installation.
- B. Weather-Resistive Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure water-resistive barrier, vapor retarder, and/or air barrier.
- C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
  - 1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
  - 2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
  - 3. Solar Optical Properties: Comply with NFRC 300 test method.
- D. Fully Tempered Safety Glass: Shall meet impact resistance per ANSI Z97.1 - Class A, or 16 CFR 1201 - Category II criteria for safety glazing used in hazardous locations.

### **2.03 GLASS MATERIALS**

- A. Float Glass: Provide float glass based glazing unless otherwise indicated.
  - 1. Kind FT - Fully Tempered Type: Complies with ASTM C1048.
  - 2. Fully Tempered Safety Glass: Shall meet impact resistance per ANSI Z97.1 - Class A, or 16 CFR 1201 - Category II criteria for safety glazing used in hazardous locations.
  - 3. Tinted Type: ASTM C1036, Class 2 - Tinted, Quality - Q3, with color and performance characteristics as indicated.

4. Thicknesses: Glass thicknesses listed are minimum. Deflection shall be no greater than the thickness of the glass. Final glazing thickness shall comply with all specification reference standards and glazing manufacturer recommendations for span width and height of each installation.
- B. Laminated Glass: Float glass laminated in accordance with ASTM C1172.
  1. Laminated Safety Glass: Complies with ANSI Z97.1 - Class A or 16 CFR 1201 - Category II impact test requirements.
  2. Polyvinyl Butyral (PVB) Interlayer: 0.030 inch thick, minimum.

## **2.04 INSULATED GLASS UNITS**

- A. Manufacturers:
  1. Glass: Any of the manufacturers specified for float glass, unless specifically required by manufacturer's tested assembly.
- B. Fabricator: Certified by glass manufacturer for type of glass, coating, and treatment involved and capable of providing specified warranty.
- C. Insulated Glass Units: Types as indicated.
  1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
  2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
  3. Metal-Edge Spacers: Aluminum, bent and soldered corners.
  4. Spacer Color: Aluminum.
  5. Edge Seal:
    - a. Dual-Sealed System: Provide polyisobutylene sealant as primary seal applied between spacer and glass panes, and silicone sealant as secondary seal applied around perimeter.
    - b. Color: Black.
  6. Space between lites filled with air.
  7. Purge interpane space with dry air, hermetically sealed.
  8. Capillary Tubes: Provide tubes from air space for insulating glass units without inert type gas that have a change of altitude greater than 2500 feet between point of fabrication and point of installation to permit pressure equalization of air space.
    - a. Capillary Tubes: Tubes to remain open and be of length and material type in accordance with insulating glass fabricator's requirements.
- D. Type IGU - Insulated Glass Units:
  1. Applications: Exterior glazing unless otherwise indicated.
  2. Outboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
    - a. Tint: Light Gray Appearance.
    - b. Coating: Low-E (passive type), on #2 surface.
  3. Metal edge spacer.
  4. Inboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
    - a. Tint: Clear.
  5. Total Thickness: 1 inch.
  6. Thermal Transmittance (U-Value), Summer - Center of Glass: 0.29, maximum.
  7. Visible Light Transmittance (VLT): 36 percent, nominal.
  8. Solar Heat Gain Coefficient (SHGC): 0.23, maximum.
  9. Visible Light Reflectance, Outside: 13 percent, maximum.
  10. Glazing Method: Dry glazing method, gasket glazing.
- E. Type IGSEF - Insulated Glass with applied SEcurity Film
  1. Applications: Where indicated on the drawings.
  2. Outboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
    - a. Tint: Light Gray Appearance.

- b. Coating: Low-E (passive type), on #2 surface.
  3. Inboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
    - a. Tint: Clear.
    - b. Provide Security Film as specified in 08 8723-Security Films.
    - c. Apply Security Film on #4 surface.
  4. Total Thickness: 1 inch.
  5. Thermal Transmittance (U-Value), Summer - Center of Glass: 0.29, maximum.
  6. Visible Light Transmittance (VLT): 36 percent, minimum.
  7. Solar Heat Gain Coefficient (SHGC): 0.23, maximum.
  8. Visible Light Reflectance, Outside: 13 percent, maximum.
  9. Forced Entry Resistance; Must comply with one of the following multiple impact test:
    - a. FTD-SA - Filti Testing and Development Shooter Attack Certification Class 1.
    - b. UL 972 tests in compliance with level of burglary and forced-entry resistance indicated; Multiple Impact.
  10. Wet Glaze Anchoring System: Structural Silicone Sealant/Adhesive.
    - a. Dow Chemical Company; Dowsil 995 Silicone Structural Sealant: [www.dow.com](http://www.dow.com).
- F. Type IGE - Insulated Glass Etched:
  1. Applications: Where indicated on the drawings.
  2. Outboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
    - a. Tint: Light Gray Appearance.
    - b. Coating: Low-E (passive type), on #2 surface.
  3. Metal edge spacer.
  4. Inboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
    - a. Tint: Clear/Etched.
    - b. Type: Provide glazing Type GE with etching on surface #3.
  5. Total Thickness: 1 inch.
  6. Thermal Transmittance (U-Value), Summer - Center of Glass: 0.29, maximum.
  7. Visible Light Transmittance (VLT): 36 percent, minimum.
  8. Solar Heat Gain Coefficient (SHGC): 0.23, maximum.
  9. Visible Light Reflectance, Outside: 13 percent, maximum.
  10. Glazing Method: Dry glazing method, gasket glazing.
- G. Type IGS - Insulated Glass Spandrel:
  1. Applications: Exterior spandrel glazing unless otherwise indicated.
  2. Outboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
    - a. Tint: Light Gray Appearance.
    - b. Coating: Same as Type IGU, on #2 surface.
  3. Metal edge spacer.
  4. Inboard Lite: Fully tempered float glass, 1/4 inch thick.
    - a. Tint: Clear.
    - b. Opacifier: Ceramic frit, on #4 surface.
    - c. Opacifier Color: Match Type IGU.
  5. Total Thickness: 1 inch.
  6. Glazing Method: Dry glazing method, gasket glazing.

## 2.05 GLAZING UNITS

- A. Type GTC - Glass Tempered Clear:
    1. Applications: Interior glazing unless otherwise indicated.
    2. Glass Type: Fully tempered float glass.
    3. Tint: Clear.
    4. Thickness: 1/4 inch, minimum.
  - B. Type GLSA - Glass Laminated SAfety:
    1. Applications: Locations as indicated on drawings.
-

2. Tint: Clear.
3. Thickness: 1/2 inch, nominal.
  - a. Outer Lite: Fully Tempered glass.
  - b. Interlayer: Polyvinyl butyral (PVB), thickness as required to meet performance criteria.
  - c. Inside Lite: Tempered glass.
- C. Type GIBJ - Glass Interior Butt Joint:
  1. Applications: As scheduled.
  2. Glass Type: Fully tempered float glass.
  3. Tint: Clear.
  4. Thickness: Glass thickness shall be per GANA and manufacturers recommendations for span width and height of each installation. Deflection shall be no greater than the thickness of the glass. Final glazing thickness shall comply with all specification reference standards and glazing manufacturer recommendations.
  5. Glazing Method: Butt joint glazing method, sealant only.
  6. Provide 3/8" gap between glazing panels or as required by the manufacturer.
- D. Type GE - Glass Etched: Etched patterns on glass as full-coverage or discrete designs.
  1. Applications: Locations as indicated on drawings..
  2. Glass Type: Monolithic; fully tempered glass; clear glass.
  3. Thickness: 1/4 inch, minimum.
  4. Pattern: Standard Etched Glass, 1-sided.
    - a. Where used as part of an insulated glazed unit provide etching on surface #3.
  5. Cutting: Straight; prior to heat-treatment.
  6. Shaping and Edge Finishing: Edge grinding; prior to heat-treatment.
  7. Finish: F1 - Patterned one side; ASTM C1036.
  8. Glazing Method: Dry glazing method, gasket glazing.

## 2.06 GLAZING COMPOUNDS

- A. Butyl Sealant: Single component; ASTM C920 Grade NS, Class 12-1/2, Uses M and A, Shore A hardness of 10 to 20; black color.
- B. Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; nonbleeding, nonstaining; ASTM C920 Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.
- C. Silicone Structural Sealant: Single component; neutral curing; designed specifically for structural bonding applications of glass; ASTM C920 Type S, Grade NS, Class 50, Uses NT, A, and G; with cured Shore A hardness range of 40; color as selected.
  1. Basis of Design: Dow Chemical Company; Dowsil 995 Silicone Structural Sealant: [www.dow.com](http://www.dow.com).

## 2.07 ACCESSORIES

- A. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.
- B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness. Minimum 3 inch long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.
- C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black color.
- D. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; color black.
- E. Glazing Clips: Manufacturer's standard type.

## **PART 3 EXECUTION**

### **3.01 VERIFICATION OF CONDITIONS**

- A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
- B. Verify that the minimum required face and edge clearances are being provided.
- C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.
- D. Verify that sealing between joints of glass framing members has been completed effectively.
- E. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

### **3.03 INSTALLATION, GENERAL**

- A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.
- B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.
- C. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.
- D. Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.
- E. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.
- F. Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-safing, plastering, mortar droppings, and paint.

### **3.04 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)**

- A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
- D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

### **3.05 INSTALLATION - BUTT JOINT GLAZING METHOD (SEALANT ONLY)**

- A. Temporarily brace glass in position for duration of glazing process; mask edges of glass at adjoining glass edges and between glass edges and framing members.
- B. Temporarily secure a small diameter nonadhering foamed rod on back side of joint.
- C. Apply sealant to open side of joint in continuous operation; thoroughly fill joint without displacing foam rod, and then tool sealant surface smooth to concave profile.
- D. Permit sealant to cure then remove foam backer rod, and then apply sealant to opposite side, tool smooth to concave profile.

- E. Remove masking tape.

**3.06 INSTALLATION - STRUCTURAL SILICONE GLAZING**

- A. See Section 08 4313 for wall framing assembly requirements.
- B. See Section 08 4413 for wall framing assembly requirements.
- C. Application - Field Glazed: Follow basic guidelines of structural silicone glazing for glazing application.
- D. Provide only structural silicone sealant, tested and manufactured for structural glazing.

**3.07 INSTALLATION - PLASTIC FILM**

- A. Install plastic film with adhesive, applied in accordance with film manufacturer's instructions.
- B. Place without air bubbles, creases or visible distortion.

**3.08 CLEANING**

- A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
- B. Remove nonpermanent labels immediately after glazing installation is complete.
- C. Clean glass and adjacent surfaces after sealants are fully cured.
- D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

**3.09 PROTECTION**

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.
- B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

**END OF SECTION**

**SECTION 08 8300  
MIRRORS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Unframed Mirrors.
  - 1. Tempered glass.

**1.02 RELATED REQUIREMENTS**

- A. Section 10 2800 - Toilet, Bath, and Laundry Accessories: Framed mirrors at restrooms.

**1.03 REFERENCE STANDARDS**

- A. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.
- B. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass 2018.
- C. ASTM C1193 - Standard Guide for Use of Joint Sealants 2016 (Reapproved 2023).
- D. GANA (GM) - GANA Glazing Manual 2022.
- E. GANA (SM) - GANA Sealant Manual 2008.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data on Mirror Types: Submit structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
- C. Product Data on Glazing Compounds: Submit chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
- D. Samples: Submit two samples, 4 x 6 inch in size, illustrating mirrors design, edging, and coloration.
- E. Manufacturer's Certificate: Certify that mirrors, meets or exceeds specified requirements.
- F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

**1.05 QUALITY ASSURANCE**

- A. Perform Work in accordance with GANA (GM) and GANA (SM) for glazing installation methods.
- B. Fabricate, store, transport, receive, install, and clean mirrors in accordance with manufacturer's recommendations.

**1.06 FIELD CONDITIONS**

- A. Do not install mirrors when ambient temperature is less than 50 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

**1.07 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year manufacturer warranty for reflective coating on mirrors and replacement of same.

**PART 2 PRODUCTS**

**2.01 MATERIALS**

- A. Mirror Design Criteria: Select materials and/or provide supports as required to limit mirror material deflection to 1/200, or to the flexure limit of glass, with full recovery of glazing materials, whichever is less.

- B. Mirror Glass; Type MIR: Clear, tempered safety glass; ASTM C1048, with copper and silver coatings, and protective overcoating.
  - 1. Applications: Provide and install mirrors on wall where noted on drawings as Unframed Mirror.
  - 2. Thickness: 1/4 inch.
  - 3. Edges: Ground.
  - 4. Size: As indicated on drawings.

## **2.02 GLAZING COMPOUNDS**

- A. Silicone Sealant: ASTM C920, Type S, Grade NS, Class 25, Uses M and A; single component; chemical or solvent curing; non-bleeding, non-staining, cured Shore A hardness of 15 to 25; color as selected.

## **2.03 ACCESSORIES**

- A. Glazing Tape: Preformed butyl compound; 10 to 15 Shore A durometer hardness; on release paper.
- B. Glazing Clips: Manufacturer's standard type.
- C. Mirror Attachment Accessories: Stainless steel clips.
- D. Mirror Adhesive: Silicone pre-polymer based, chemically compatible with mirror coating and wall substrate.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that openings for mirrored glazing are correctly sized and within tolerance.
- B. Verify that surfaces of mirror frames or recesses are clean, free of obstructions, and ready for installation of mirrors.

### **3.02 PREPARATION**

- A. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous mirror frames or recesses with substrate compatible primer or sealer. Prime surfaces scheduled to receive sealant.
- C. Prepare installation in accordance with ASTM C1193 for solvent release sealants, and install sealant in accordance with manufacturer's instructions.

### **3.03 INSTALLATION**

- A. Install mirrors in accordance with manufacturer's recommendations.
- B. Set mirrors plumb and level, and free of optical distortion.
- C. Set mirrors with edge clearance free of surrounding construction including countertops or backsplashes.
- D. Frameless Mirrors: Set mirrors with clips, and anchor rigidly to wall construction.

### **3.04 CLEANING**

- A. Remove wet glazing materials from finish surfaces.
- B. Remove labels after work is complete.
- C. Clean mirrors and adjacent surfaces.

**END OF SECTION**



**SECTION 08 8723  
SECURITY FILMS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Glazing film applied to new glazing assemblies.
- B. All film and anchoring shall be field installed by qualified and certified applicators.

**1.02 RELATED REQUIREMENTS**

- A. Section 08 1113 - Hollow Metal Doors and Frames: New doors with glazing to receive film.
- B. Section 08 4313-Aluminum-Framed Storefronts: New glazing to receive film.
- C. Section 08 4413 - Glazed Aluminum Curtain Walls: New glazing to receive film.
- D. Section 08 8000 - Glazing: New glazing to received film.

**1.03 REFERENCE STANDARDS**

- A. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.
- B. ASTM C1184 - Standard Specification for Structural Silicone Sealants 2023.
- C. ASTM D882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting 2018.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023b.
- E. FTD-SA - Filti Testing and Development Shooter Attack Certification. Current Edition.
- F. UL 972 - Standard for Burglary Resisting Glazing Material Current Edition, Including All Revisions.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Record of product certification for safety requirements.
  - 2. Preparation instructions and recommendations.
  - 3. Storage and handling requirements and recommendations.
  - 4. Installation methods.
- C. Shop Drawings: Detailing installation of film, anchoring accessories, and sealant.
- D. Samples: For each film product to be used, minimum size 4 inches by 6 inches, representing actual product, color, and patterns.
- E. Samples, Supplemental Anchors: Where supplemental anchors are necessary to achieve specified performance submit detailed information in accordance with substitution procedures; include two samples, minimum length 2 inches.
- F. Test Reports: Detailed reports of full-scale chamber tests to specified criteria, using assemblies identical to those required for this project.
- G. Specimen Warranty.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Glazing film manufacturer specializing in manufacture of safety glazing films with minimum 10 years successful experience.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of authorities having jurisdiction.

### 1.07 FIELD CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

### 1.08 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide 10 year manufacturer's replacement warranty to cover film against peeling, cracking, discoloration, and deterioration.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. 3M Window Film: [www.solutions.3m.com/#sle](http://www.solutions.3m.com/#sle).
- B. Armoured One: [www.armouredone.com/#sle](http://www.armouredone.com/#sle).
- C. Madico, Inc: [www.madico.com/#sle](http://www.madico.com/#sle).
- D. Substitutions: See Section 01 6000 - Product Requirements.

### 2.02 SECURITY FILM

- A. Security Film: Transparent polyester security film for permanent bonding to glass.
  - 1. Basis of Design: 3M, S140 transparent security film for permanent bonding to glass.
  - 2. Thickness: 0.014 inch, minimum.
  - 3. Color: Clear.
  - 4. Construction: Multi-ply laminate.
  - 5. Adhesive Type: Pressure sensitive acrylic.
  - 6. Tensile Strength: 25,000 psi minimum when tested in accordance with ASTM D882.
  - 7. Breaking Strength: 350 psi when tested in accordance with ASTM D882.
  - 8. Forced Entry Resistance; Must comply with one of the following multiple impact test:
    - a. FTD-SA - Filti Testing and Development Shooter Attack Certification Class 1.
    - b. UL 972 tests in compliance with level of burglary and forced-entry resistance indicated; Multiple Impact.
  - 9. Surface Burning Characteristics: Flame spread index of 25, maximum, and smoke developed index of 450, maximum, when tested in accordance with ASTM E84 (Class A).
  - 10. Anchoring System: Provide silicone structural sealant attachment system installed per manufacturers recommendations.
- B. Accessory Materials: As recommended or required by film manufacturer.
- C. Supplementary Anchors: As required by performance criteria and acceptable to Architect.
- D. Silicone Structural Sealant: Self-priming, elastomeric adhesive complying with ASTM C1184.
  - 1. Silicone Structural Sealant: Single component; neutral curing; designed specifically for structural bonding applications of glass; ASTM C920 Type S, Grade NS, Class 50, Uses NT, A, and G; with cured Shore A hardness of 40; color as selected.
  - 2. Basis of Design: Dow Chemical Company; Dowsil 995 Silicone Structural Sealant: [www.dow.com](http://www.dow.com).
- E. Glass Cleaner: As recommended by glazing film manufacturer.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Field -Applied Film: Verify that existing conditions are adequate for proper application and performance of film.
- B. Examine glass and frames. Verify that existing conditions are adequate for proper application and performance of film.

- C. Verify glass is not cracked, chipped, broken, or damaged.
- D. Verify that frames are securely anchored and free of defects.
- E. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### **3.02 PREPARATION**

- A. Clean glass of dust, dirt, paint, oil, grease, mildew, mold, and other contaminants that would inhibit adhesion.
- B. Immediately prior to applying film, thoroughly wash glass with neutral cleaning solution.
- C. Protect adjacent surfaces.
- D. Do not begin installation until substrates have been properly prepared.

### **3.03 INSTALLATION**

- A. Do not apply glazing film when surface temperature is less than 40 degrees F or if precipitation is imminent.
- B. Install in accordance with manufacturer's instructions, without air bubbles, wrinkles, streaks, bands, thin spots, pinholes, or gaps, as required to achieve specified performance.
- C. Seams: Seam film only as required to accommodate material sizes; form seams vertically without overlaps and gaps; do not install with horizontal seams.
- D. Structural Sealant and Supplemental Anchors: Install in accordance with manufacturer's instructions and shop drawings.
- E. Clean glass and anchoring accessories following installation. Remove excess sealants and other glazing materials from adjacent finished surfaces.
- F. Remove labels and protective covers.

### **3.04 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

**END OF SECTION**



**SECTION 08 8813  
FIRE-RATED GLAZING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Fire-rated glazing units.
- B. Glazing compounds.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 9200 - Joint Sealants: Sealants for other than glazing purposes.
- B. Section 08 1213 - Hollow Metal Frames: Glazed borrowed lites.
- C. Section 08 1416 - Flush Wood Doors: Glazed lites in doors.

**1.03 REFERENCE STANDARDS**

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials Current Edition.
- B. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers 2005 (Reapproved 2019).
- C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.
- D. ASTM C1193 - Standard Guide for Use of Joint Sealants 2016 (Reapproved 2023).
- E. GANA (GM) - GANA Glazing Manual 2022.
- F. GANA (SM) - GANA Sealant Manual 2008.
- G. GANA (LGRM) - Laminated Glazing Reference Manual 2019.
- H. ICC (IBC) - International Building Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- I. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use 1990 (2016).
- J. ITS (DIR) - Directory of Listed Products Current Edition.
- K. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies 2022.
- L. NFPA 257 - Standard on Fire Test for Window and Glass Block Assemblies 2022.
- M. UL (DIR) - Online Certifications Directory Current Edition.
- N. UL 9 - Standard for Fire Tests of Window Assemblies Current Edition, Including All Revisions.
- O. UL 10B - Standard for Fire Tests of Door Assemblies Current Edition, Including All Revisions.
- P. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies Current Edition, Including All Revisions.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene preinstallation meeting one week before starting work of this section; require attendance by each of affected installers.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data on Glazing Unit Glazing Types: Provide structural, physical, and environmental characteristics, size limitations, special handling and installation requirements.
- C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
- D. Samples: Two samples 4 by 6 inch in size of glass units.
- E. Certificate: Certify that products of this section meet or exceed specified requirements.

- F. Manufacturer's qualification statement.
- G. Installer's qualification statement.
- H. Specimen warranty.

#### **1.06 QUALITY ASSURANCE**

- A. Perform work in accordance with GANA (GM), GANA (SM), GANA (LGRM), and IGMA TM-3000 for glazing installation methods.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
  - 1. Provide certified glass products through ANSI accredited certifications that include plant audits and independent laboratory performance testing.
    - a. Insulating Glass Certification Council (IGCC).
    - b. Safety Glazing Certification Council (SGCC).
- C. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

#### **1.07 MOCK-UPS**

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Provide on-site glazing mock-up with specified glazing components.
- C. Locate where directed.
- D. Mock-ups may remain as part of work.

#### **1.08 FIELD CONDITIONS**

- A. Ambient Conditions: Do not install glazing when ambient temperature is less than 40 degrees F.
- B. Maintain minimum ambient temperature before, during, and 24 hours after installation of glazing compounds.

#### **1.09 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Correct defective Work within a one year period after Date of Substantial Completion.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Fire-Protection-Rated Glass:
  - 1. Fabricators:
    - a. GGI - General Glass International: [www.generalglass.com/#sle](http://www.generalglass.com/#sle).
    - b. McGrory Glass, Inc: [www.mcgrory.com/glass/fire-rated-glass-schott-pyran-platinum/#sle](http://www.mcgrory.com/glass/fire-rated-glass-schott-pyran-platinum/#sle).
  - 2. Manufacturers:
    - a. McGrory Glass, Inc: [www.mcgrory.com/fire-rated-glass/#sle](http://www.mcgrory.com/fire-rated-glass/#sle).
    - b. SAFTIFIRST, a division of O'Keeffe's Inc: [www.safti.com/#sle](http://www.safti.com/#sle).
    - c. SCHOTT North America Inc: [www.us.schott.com/#sle](http://www.us.schott.com/#sle).
    - d. Technical Glass Products: [www.fireglass.com/#sle](http://www.fireglass.com/#sle).
    - e. Vetrotech North America: [www.vetrotechusa.com/#sle](http://www.vetrotechusa.com/#sle).
    - f. Substitutions: See Section 01 6000 - Product Requirements.

#### **2.02 GLAZING UNITS**

- A. Type GFPR - Glass Fire-Protection-Rated: Type, thickness, and configuration of glazing that contains flame, smoke, and does not block radiant heat, as required to achieve indicated fire rating period as indicated on drawings.
  - 1. Applications:

- a. Glazing in fire-protection-rated door assembly.
  - b. Glazing in fire-protection-rated window assembly.
  - c. Other locations as indicated on drawings.
2. Provide products listed by ITS (DIR) or UL (DIR) and approved by authorities having jurisdiction.
3. Safety Glazing Certification: 16 CFR 1201 Category II.
4. Glazing Method: As required for fire rating.
5. Fire-Rating Period: As indicated on drawings.
6. Markings for Fire-Protection-Rated Glazing Assemblies: Provide permanent markings on fire-protection-rated glazing in compliance with ICC (IBC), local building code, and authorities having jurisdiction
  - a. "D" - meets fire door assembly criteria of NFPA 252, UL 10B, or UL 10C fire test standards.
  - b. "OH" - meets fire window assembly criteria, including hose stream test of NFPA 257 or UL 9 fire test standards.
  - c. "H" - meets fire door assembly hose stream test of NFPA 252, UL 10B, or UL 10C fire tests standards.
  - d. "XXX" - placeholder that represents fire-rating period, in minutes.

## **2.03 GLAZING COMPOUNDS**

- A. Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; nonbleeding, nonstaining; ASTM C920 Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.

## **2.04 ACCESSORIES**

- A. Setting Blocks: Neoprene, EPDM, or silicone, with 70 to 90 Shore A durometer hardness. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.
- B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Continuous by one half the height of glazing stop by thickness to suit application, self adhesive on one face.
- C. Glazing Tape: Closed-cell polyvinyl chloride (PVC) foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent, designed for compression of 25 percent to affect air barrier and vapor retarder seal.
- D. Glazing Gaskets: Flexible intumescent seals.
  1. Material: Co-extruded intercalated graphite combined with thermoplastic lip.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
- B. Verify that minimum required face and edge clearances are provided.
- C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.
- D. Verify that sealing between joints of glass framing members has been completed effectively.
- E. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.

- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

### **3.03 INSTALLATION - GENERAL**

- A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers unless more stringent requirements are indicated, including those in referenced glazing standards.
- B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.
- C. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.
- D. Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.
- E. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.
- F. Prevent glass from contact with contaminating substances that may result from construction operations including, but not limited to weld spatter, fire-safing, plastering, mortar droppings, etc.

### **3.04 CLEANING**

- A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.
- B. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
- C. Remove nonpermanent labels immediately after glazing installation is complete.
- D. Clean glass and adjacent surfaces after sealants are fully cured.
- E. Clean glass on both exposed surfaces not more than four days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

### **3.05 PROTECTION**

- A. After installation, mark pane with 'X' by using removable plastic tape or paste; do not mark heat-absorbing or reflective glass units.
- B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

**END OF SECTION**



**SECTION 08 8856  
SECURITY GLAZING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Glass Units: Ballistic-Resistant.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 9200 - Joint Sealants: Sealants for other than glazing purposes.
- B. Section 08 1113 - Hollow Metal Doors and Frames: Glazed lites in doors and borrowed lites.
- C. Section 08 1416 - Flush Wood Doors: Glazed lites in doors.
- D. Section 08 4313 - Aluminum-Framed Storefronts: Glazing provided as part of storefront assembly.
- E. Section 08 4413 - Glazed Aluminum Curtain Walls: Glazing provided as part of wall assembly.

**1.03 REFERENCE STANDARDS**

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials current edition.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test 2015.
- C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures Most Recent Edition Cited by Referring Code or Reference Standard.
- D. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers 2005 (Reapproved 2019).
- E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.
- F. ASTM C1036 - Standard Specification for Flat Glass 2016.
- G. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass 2018.
- H. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass 2014.
- I. ASTM C1184 - Standard Specification for Structural Silicone Sealants 2023.
- J. ASTM C1349 - Standard Specification for Architectural Flat Glass Clad Polycarbonate 2017.
- K. GANA (GM) - GANA Glazing Manual 2008.
- L. GANA (SM) - GANA Sealant Manual 2008.
- M. GANA (LGRM) - Laminated Glazing Reference Manual 2019.
- N. ICC (IBC) - International Building Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- O. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use 1990 (2016).
- P. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems 2017.
- Q. UL (DIR) - Online Certifications Directory Current Edition.
- R. UL 752 - Standard for Bullet-Resisting Equipment Current Edition, Including All Revisions.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by each of the affected installers.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.

- B. Product Data on Insulating Glass Unit and Glazing Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
- C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
- D. Samples: Submit two samples 4 by 6 inch in size of glass units.
- E. Certificate: Certify that products of this section meet or exceed specified requirements.
- F. Manufacturer's qualification statement.
- G. Installer's qualification statement.
- H. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

#### **1.06 QUALITY ASSURANCE**

- A. Perform Work in accordance with GANA (GM), GANA (SM), GANA (LGRM), and IGMA TM-3000 for glazing installation methods.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.
  - 1. Provide certified glass products through ANSI accredited certifications that include plant audits and independent laboratory performance testing.
    - a. Insulating Glass Certification Council (IGCC).
    - b. Safety Glazing Certification Council (SGCC).
- C. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years documented experience and approved by manufacturer.

#### **1.07 FIELD CONDITIONS**

- A. Do not install glazing when ambient temperature is less than 40 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

#### **1.08 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Insulating Glass Units: Provide a five (5) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.
- C. Laminated Glass: Provide a five (5) year manufacturer warranty to include coverage for delamination, including providing products to replace failed units.
- D. Polycarbonate Sheet Glazing: Provide a five (5) year manufacturer warranty to include coverage for breakage, coating failure, abrasion resistance, including providing products to replace failed units.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Laminated Ballistic-Resistant Glass Manufacturers:
  - 1. Global Security Glazing: [www.security-glazing.com](http://www.security-glazing.com).
  - 2. Oldcastle BuildingEnvelope: [www.obe.com](http://www.obe.com).
  - 3. Total Security Solutions, Inc: [www.tssbulletproof.com](http://www.tssbulletproof.com).
  - 4. Substitutions: Refer to Section 01 6000-Product Requirements.

#### **2.02 GLASS MATERIALS**

- A. Float Glass: Provide float glass based glazing unless otherwise indicated.
  - 1. Kind FT - Fully Tempered Type: Complies with ASTM C1048.

2. Fully Tempered Glass: Complies with ANSI Z97.1 - Class A, or 16 CFR 1201 - Category II criteria.
  3. Tinted Type: ASTM C1036, Class 2 - Tinted, Quality - Q3, with color and performance characteristics as indicated.
  4. Thicknesses: Glass thicknesses listed are minimum. Deflection shall be no greater than the thickness of the glass. Final glazing thickness shall comply with all specification reference standards and glazing manufacturer recommendations for span width and height of each installation.
- B. Laminated Glass: Float glass laminated in accordance with ASTM C1172.
1. Laminated Glass: Complies with ANSI Z97.1 - Class A or 16 CFR 1201 - Category II impact test requirements.
  2. Forced Entry Resistance: See glazing types for specific requirements for each assembly.
  3. Polyvinyl Butyral (PVB) Interlayer: 0.030 inch thick, minimum or manufactures custom security inerlayer as required to meet performance criteria.

### 2.03 GLASS UNITS

- A. Type GCP - Glass-Clad Polycarbonate:
1. Glass-Clad Polycarbonate Security Glazing: Laminated glass and polycarbonate, multiply; ASTM C1349.
  2. Applications: Locations as indicated on drawings.
  3. Tint: Clear.
  4. Thickness: \_\_\_\_\_ inch.
  5. Outer Lite: Fully Tempered glass.
  6. Interlayers: Series of laminating sheets, glass and polycarbonate, thickness as required to meet performance criteria.
  7. Inside Lite: Fully Tempered glass.
  8. Performance Criteria:
    - a. Bullet Resistance: Pass UL 752 tests in compliance with ballistic criteria level and weapon description indicated; \_\_\_\_\_.
  9. Wet Glaze Anchoring System: Structural Silicone Sealant/Adhesive.
    - a. Dow Chemical Company; Dowsil 995 Silicone Structural Sealant: [www.dow.com](http://www.dow.com).

### 2.04 ACCESSORIES

- A. Silicone Structural Sealant: Self-priming, elastomeric adhesive complying with ASTM C1184.
1. Silicone Structural Sealant: Single component; neutral curing; designed specifically for structural bonding applications of glass; ASTM C920 Type S, Grade NS, Class 50, Uses NT, A, and G; with cured Shore A hardness of 40; color as selected.
  2. Basis of Design: Dow Chemical Company; Dowsil 995 Silicone Structural Sealant: [www.dow.com](http://www.dow.com).
- B. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.
- C. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.
- D. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black color.
- E. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color as selected.
- F. Glazing Clips: Manufacturer's standard type.

## **PART 3 EXECUTION**

### **3.01 VERIFICATION OF CONDITIONS**

- A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
- B. Verify that the minimum required face and edge clearances are being provided.
- C. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.
- D. Verify that sealing between joints of glass framing members has been completed effectively.
- E. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

### **3.02 PREPARATION**

- A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

### **3.03 INSTALLATION, GENERAL**

- A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.
- B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.
- C. Do not exceed edge pressures around perimeter of glass lites as stipulated by glass manufacturer.
- D. Set glass lites of system with uniform pattern, draw, bow, and similar characteristics.
- E. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.
- F. Structural Sealant and Supplemental Anchors: Install in accordance with manufacturer's instructions and shop drawings.
- G. Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-safing, plastering, mortar droppings, etc.

### **3.04 CLEANING**

- A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
- B. Remove nonpermanent labels immediately after glazing installation is complete.
- C. Clean glass and adjacent surfaces after sealants are fully cured.
- D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

### **3.05 PROTECTION**

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.
- B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

**END OF SECTION**

**SECTION 09 2116  
GYPSUM BOARD ASSEMBLIES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Performance criteria for gypsum board assemblies.
- B. Exterior gypsum sheathing.
- C. Gypsum wallboard.
- D. Joint treatment and accessories.
- E. Textured finish system.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 4000 - Cold-Formed Metal Framing: Structural steel stud framing.
- B. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.
- C. Section 07 2100 - Thermal Insulation: Acoustic insulation.
- D. Section 07 2500 - Weather Barriers: Water-resistive barrier over sheathing.
- E. Section 07 8400 - Firestopping: Top-of-wall assemblies at fire-resistance-rated walls.
- F. Section 07 9200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

**1.03 REFERENCE STANDARDS**

- A. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board 2017 (Reapproved 2022).
- B. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products 2020.
- C. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board 2020.
- D. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications 2022.
- E. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness 2022.
- F. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs 2022.
- G. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base 2019.
- H. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing 2017.
- I. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel 2018.
- J. ASTM C1280 - Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing 2018.
- K. ASTM C1396/C1396M - Standard Specification for Gypsum Board 2017.
- L. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber 2021.
- M. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).
- N. ASTM E413 - Classification for Rating Sound Insulation 2022.
- O. GA-214 - Levels of Finish for Gypsum Panel Products 2021.

- P. GA-216 - Application and Finishing of Gypsum Panel Products 2021.
- Q. GA-226 - Application of Gypsum Board to Form Curved Surfaces 2019.

#### **1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.
- C. Product Data: Provide data on gypsum board, glass mat faced gypsum board, accessories, and joint finishing system.

#### **1.05 QUALITY ASSURANCE**

- A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum five years of experience.
- B. Product Qualifications:
  - 1. Single Source Responsibility:
    - a. Obtain gypsum board products, joint treatment products, and textured coatings from a single manufacturer.
- C. Mock-ups
  - 1. At an area on the site where approved by the Architect, provide a mock-up gypsum wallboard panel.
    - a. Make the panel approximately 4'-0" square.
    - b. Provide one mock-up panel for each gypsum wallboard finish used on the Work.
    - c. For exterior gypsum sheathing, panel shall be complete with all joint sealant, wall ties and/or connectors, flashings and face veneer.
    - d. The mock-ups may be used as part of the Work, and may be included in the finished Work, when so approved by the Architect.
    - e. Revise as necessary to secure the Architect's approval.
  - 2. The mock-up panels, when approved by the Architect, will be used as datum points for comparison with the remainder of the work of this Section for the purpose of acceptance or rejection.
- D. Reference Standards:
  - 1. Install gypsum board in accordance with applicable requirements and recommendations of Gypsum Association GA 216, "Recommended Specifications for the Application and Finishing of Gypsum Board", except for more stringent requirements of manufacturer.
  - 2. Apply acoustical sealant in accordance with applicable requirements of ASTM C919.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with requirements of Section 01 6000 – Product Requirements.
- B. Acceptance at Site
  - 1. Deliver material to site promptly without undue exposure to weather.
  - 2. Deliver in manufacturer's unopened containers or bundles, fully identified with name, brand, type and grade.
- C. Storage and Protection
  - 1. Protect materials from contamination, dampness, freezing, or overheating in accordance with manufacturer's instructions.
  - 2. Store above ground in dry, ventilated space.
  - 3. Broken, or damaged gypsum board will be rejected, whether built-in or not.

#### **1.07 PROJECT CONDITIONS**

- A. Project Environmental Requirements
  - 1. Comply with requirements of referenced standards and recommendations of material manufacturers for environmental conditions before, during, and after installation.

2. Do not begin installation of gypsum board until building is completely enclosed and protected from water infiltration.
3. Do not install gypsum board when ambient temperature is below 40°F.
4. For adhesive attachment of gypsum board, and for finishing of gypsum board, maintain ambient temperature above 55°F from one week prior to attachment or joint treatment, and until joint treatment is complete and dry.
5. Maintain illumination as required for proper installation of material.

## **PART 2 PRODUCTS**

### **2.01 GYPSUM BOARD ASSEMBLIES**

- A. Provide completed assemblies complying with ASTM C840 and GA-216.
  1. See PART 3 for finishing requirements.
- B. Interior Partitions: Provide completed assemblies with the following characteristics:
  1. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
- C. Fire-Resistance-Rated Assemblies: Provide completed assemblies complying with applicable code.

### **2.02 METAL FRAMING MATERIALS**

- A. Structural and Non-Structural Steel Framing for Application of Gypsum Board: As specified in Section 05 4000.

### **2.03 BOARD MATERIALS**

- A. Manufacturers - Gypsum-Based Board:
  1. CertainTeed Corporation: [www.certainteed.com/#sle](http://www.certainteed.com/#sle).
  2. Georgia-Pacific Gypsum: [www.gpgypsum.com/#sle](http://www.gpgypsum.com/#sle).
  3. National Gypsum Company: [www.nationalgypsum.com/#sle](http://www.nationalgypsum.com/#sle).
  4. USG Corporation: [www.usg.com/#sle](http://www.usg.com/#sle).
  5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
  1. Application:
    - a. Non-fire rated partitions and ceilings: Type X.
    - b. Fire rated partitions: Type X.
    - c. Fire rated ceilings: Type C.
  2. Thickness:
    - a. Vertical Surfaces: 5/8 inch.
    - b. Ceilings: 5/8 inch.
    - c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.
  3. Paper-Faced Products:
    - a. CertainTeed Corporation; Type X and C Drywall: [www.certainteed.com/#sle](http://www.certainteed.com/#sle).
    - b. Georgia-Pacific Gypsum; ToughRock Fireguard X and C: [www.gpgypsum.com/#sle](http://www.gpgypsum.com/#sle).
    - c. National Gypsum Company; Gold Bond BRAND Fire-Shield Type X and C Gypsum Board: [www.nationalgypsum.com/#sle](http://www.nationalgypsum.com/#sle).
    - d. USG Corporation; USG Sheetrock Brand Firecode X and C Panels: [www.usg.com/#sle](http://www.usg.com/#sle).
    - e. Substitutions: See Section 01 6000 - Product Requirements.
- C. Backing Board For Wet Areas:
  1. Application: Surfaces behind tile and in wet areas including tub and shower surrounds, shower ceilings, and typical wall drywall base as detailed on the drawings.
  2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
  3. Glass Mat Faced Board: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178/C1178M.

- a. Fire-Resistance-Rated Type: Type X core, thickness 5/8 inch.
- b. Products:
  - 1) CertainTeed Corporation; GlasRoc 5/8" Type X Tile Backer:  
[www.certainteed.com/#sle](http://www.certainteed.com/#sle).
  - 2) Georgia-Pacific Gypsum; DensShield Tile Backer: [www.gpgypsum.com/#sle](http://www.gpgypsum.com/#sle).
  - 3) National Gypsum Company; Gold Bond eXP Tile Backer:  
[www.nationalgypsum.com/#sle](http://www.nationalgypsum.com/#sle).
  - 4) Substitutions: See Section 01 6000 - Product Requirements.
- D. Exterior Sheathing Board: Sizes to minimize joints in place; ends square cut.
  - 1. Application: Exterior sheathing, unless otherwise indicated.
  - 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
  - 3. Glass Mat Faced Sheathing: Glass mat faced gypsum substrate as defined in ASTM C1177/C1177M.
  - 4. Core Type: Type X, as indicated.
  - 5. Type X Thickness: 5/8 inch.
  - 6. Edges: Square.
  - 7. Glass Mat Faced Products:
    - a. CertainTeed Corporation; GlasRoc Type X Exterior Sheathing:  
[www.certainteed.com/#sle](http://www.certainteed.com/#sle).
    - b. Georgia-Pacific Gypsum; DensGlass Fireguard Sheathing:  
[www.gpgypsum.com/#sle](http://www.gpgypsum.com/#sle).
    - c. National Gypsum Company; Gold Bond eXP Sheathing:  
[www.nationalgypsum.com/#sle](http://www.nationalgypsum.com/#sle).
    - d. USG Corporation; USG Securock Brand Ultralight Glass-Mat Sheathing Firecode X:  
[www.usg.com/#sle](http://www.usg.com/#sle).
    - e. Substitutions: See Section 01 6000 - Product Requirements.

#### **2.04 GYPSUM WALLBOARD ACCESSORIES**

- A. Acoustic Insulation: As specified in Section 07 2100.
- B. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
- C. Water-Resistive Barrier: As specified in Section 07 2500.
- D. Beads, Joint Accessories, and Other Trim: ASTM C1047, galvanized steel or rolled zinc, unless noted otherwise.
  - 1. Corner Beads: Low profile, for 90 degree outside corners.
  - 2. Splayed Corner Beads: All other than 90 degree outside corner.
  - 3. Architectural Reveal Beads:
    - a. Shapes: As indicated on drawings.
  - 4. Expansion Joints:
    - a. Type: V-shaped metal with factory-installed protective tape.
  - 5. Adjustable Partition Closure between storefront and drywall: Gordon Interior Specialties; Mullion Mate. Provide insulation and gaskets. Size to match application. Finish to match storefront.
  - 6. Other trims and reveals where shown on the drawings.
- E. Moisture Guard Trim: ASTM C1047, rigid plastic, 48 inch length, applied to bottom edge of gypsum board.
  - 1. Provide 1/2" Tall Extruded PVC Moisture Guard: installed continuously at floor level of all gypsum drywall throughout building.
  - 2. On all 2-Hour Rated walls and once the wall assembly is constructed, place a bead of sealant (latex, acrylic, silicone, polymer, or similar materials – not necessarily listed "fire caulk") at floor level against the outer most layer of moisture guard on each side of the wall.



3. Height: 1/2 inch.
4. Depth: 5/8 inch.
5. Products:
  - a. Waterguard USA; Waterguard: [www.waterguard-usa.com/#sle](http://www.waterguard-usa.com/#sle).
  - b. Substitutions: See Section 01 6000 - Product Requirements.
- F. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
  1. Fiberglass Tape: 2 inch wide, coated glass fiber tape for joints and corners at glass mat faced board assemblies.
  2. Paper Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
  3. Joint Compound: Drying type, ready-mixed.
- G. Finishing Compound: Surface coat and primer, takes the place of skim coating.
- H. Textured Finish Materials: Latex- or Vinyl-based compound; plain.
- I. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inches in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion-resistant.
- J. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion-resistant.
- K. For exterior applications provide bugle or wafer head, rust-resistant sharp point, fine thread for light-gauge metal framing or furring.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that project conditions are appropriate for work of this section to commence.

#### **3.02 FRAMING INSTALLATION**

- A. Metal Framing: Install in accordance with ASTM C754 and as specified in Section 05 4000- Cold-Formed Metal Framing.
- B. Blocking: Install supplementary framing, blocking and bracing for support of:
  1. Framed openings.
  2. Wall-mounted cabinets.
  3. Plumbing fixtures.
  4. Toilet partitions.
  5. Toilet accessories.
  6. Wall-mounted door hardware.
  7. Heavy trim, furnishings or similar construction.

#### **3.03 ACOUSTIC ACCESSORIES INSTALLATION**

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
  1. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.

#### **3.04 BOARD INSTALLATION - GENERAL**

- A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Wall Tile shall be installed on Concrete Unit Masonry or Glass Mat Faced Tile Backer Board in toilet/shower rooms, around water fountains or other areas in which the tile might be exposed to moisture. If CMU is not provided in these areas, Glass Mat Faced Tile Backer Board shall be used. Wall tile to be installed on Glass Mat Faced Tile Backer Board where located in corridors.

- C. FRP shall be installed on Glass Mat Faced Tile Backer Board in toilet rooms, janitor closets, around water fountains or other areas in which the tile might be exposed to moisture.
- D. Fire-Resistance-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
- E. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.
- F. Exterior Sheathing: Comply with GA-253 and ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.
  - 1. Seal joints, cut edges, and holes with water-resistant sealant.
  - 2. Attach exterior sheathing to metal framing with screws spaced 8" o.c. at perimeter where there are framing supports; and 8" o.c. along intermediate framing in field. Do not counter sink.
  - 3. Locate fasteners minimum 3/8" from edges and ends of sheathing panels, tight against and flush with surface of sheathing.
  - 4. Immediately after installation, protect from weather by application of water-resistive barrier.
- G. Installation on Metal Framing: Use screws for attachment of gypsum board.
- H. Curved Surfaces: Apply gypsum board to curved substrates in accordance with GA-226.

### **3.05 BOARD INSTALLATION**

- A. Single Layer Gypsum Board on Metal Studs or ICF System.
  - 1. Loosely butt gypsum board joints together and neatly fit.
  - 2. Do not place butt ends against tapered edges.
  - 3. Maximum allowable gap at end joints: 1/8 inch.
  - 4. Stagger joints on opposite sides of partitions.
  - 5. Apply ceiling boards first where gypsum board ceilings and wall occur.
  - 6. Cut openings in gypsum board to fit electrical outlets, plumbing, light fixtures and piping snugly and small enough to be covered by plates and escutcheons. Cut both face and back paper.
  - 7. Screw board in place securely with screws spaced according to manufacturer's recommendations.
  - 8. At internal and external corners, conceal the cut edges of the boards by the overlapping covered edges of the abutting boards.
  - 9. Stagger the boards so that corners of any four boards will not meet at a common point except in vertical corners.
  - 10. At internal and external corners, conceal the cut edges of the boards by the overlapping covered edges of the abutting boards.
  - 11. In all installations, gypsum wallboard shall be held above the finished floor a minimum of 1/2". Failure to comply with this requirement will be grounds for rejection and removal of the entire application.
- B. Single Layer Gypsum Board on Furring
  - 1. Apply gypsum board with long dimension at right angles to furring channel.
  - 2. Center end joints over channel web; stagger end joints from those in adjacent rows of board.
  - 3. Fasten boards to furring channels with screws spaced according to manufacturer's recommendations.
- C. Double Layer Gypsum Board
  - 1. Fasten base layer to studs or furring with screws, and attach face layer using laminating adhesive and screws, applied according to manufacturer's instructions.
  - 2. Offset face-layer joints at least 10 inches from parallel base-layer joints.
  - 3. Screw both layers to metal supports at double layer ceiling applications and where required for fire-rated construction.

- D. Single Layer Gypsum Board Suspended for Ceilings:
  - 1. Install the gypsum wallboard to ceilings with the long dimension of the wallboard at right angles to the supporting members.
  - 2. Wallboard may be installed with the long dimension parallel to supporting members that are spaced 16" on centers when attachment members are provided at end joints.

### **3.06 INSTALLATION OF TRIM AND ACCESSORIES**

- A. Control Joints
  - 1. Install control joints at junction of gypsum board partitions with walls or partitions of other finish material.
  - 2. Install control joints within long runs of partitions at approximately 30'-0" on center or as indicated on the drawing.
  - 3. Install control joints at bulkheads as shown on the drawings but in no case shall they exceed 15'-0" on center or as indicated on the drawing. Contractor shall be responsible to insure that bulkheads comply with this requirement and shall coordinate locations with the architect if not shown on the drawings.
  - 4. Where gypsum board is vertically continuous, as at stairwells, provide horizontal control joints at each floor level.
  - 5. Special Trim: Install as indicated on Drawings and in accordance with manufacturer's instructions.
  - 6. Install control joints at each door jamb from head of door ceiling as shown on the drawings.
  - 7. Do not install control joints behind any applied wall coverings.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.
- D. Install metal casing bead trim whenever edge of gypsum board would otherwise be exposed or semi-exposed.
- E. Special Trim and Reveal Joints: Install as indicated on Drawings and in accordance with manufacturer's instructions.
- F. Moisture Guard Trim: Install on bottom edge of gypsum board according to manufacturer's instructions and in locations indicated on drawings.

### **3.07 JOINT TREATMENT**

- A. Finish gypsum board in accordance with levels defined in GA-214 , ASTM C840, and as follows:
  - 1. Level 1: Ceiling plenum areas and concealed areas, except provide higher level of finish as required to comply with fire resistance ratings and acoustical ratings.
  - 2. Level 2: Gypsum board substrate at tile, except remove tool marks and ridges.
  - 3. Level 3: Gypsum board surfaces, where textured finishes will be used.
  - 4. Level 4: Gypsum board surfaces scheduled to receive non-textured painted finishes, vinyl wall covering or custom covering is to be applied, except where another finish level is indicated.
  - 5. Level 5: Gypsum board surfaces scheduled to receive painted graphics or Dry-Erase Coating.
- B. General:
  - 1. Inspect areas to be joint treated, verifying that the gypsum wallboard fits snugly against supporting framework.
  - 2. In areas where joint treatment and compound finishing will be performed, maintain a temperature of not less than 55 degrees for 24 hours prior to commencing the treatment, and until joint and finishing compounds have dried.
  - 3. Apply the joint treatment and finishing compound by machine or hand tool.

4. Provide a minimum drying time of 24 hours between coats, with additional drying time in poorly ventilated areas.
  5. Joint Treatment is required at all gypsum board walls including fire protection assemblies and ICF installations above the ceiling line.
- C. Embedding compounds:
1. Apply to gypsum wallboard joints and fastener heads in a thin uniform layer.
  2. Spread the compound not less than 3" wide at joints, center the reinforcing tape in the joint, and embed the tape in the compound. Then spread a thin layer of compound over the tape.
  3. After this treatment has dried, apply a second coat of embedding compound to joints and fastener heads, spreading in a thin uniform coat to not less than 6" wide at joints, and feather edged.
  4. Sandpaper between coats as required.
  5. When thoroughly dry, sandpaper to eliminate ridges and high points.

### **3.08 TEXTURE FINISH**

- A. Apply finish texture coating by means of spraying apparatus in accordance with manufacturer's instructions.
- B. Texture Required: Unless shown or otherwise indicated on the drawings, provide medium "Orange Peel or Spatter Finish" texture on walls or ceilings.

### **3.09 TOLERANCES**

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

**END OF SECTION**

**SECTION 09 2226  
SUSPENSION SYSTEMS**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Related Documents: General and Supplementary Conditions of the Contract, Division 1 General Requirements, and Drawings are applicable to this Section.
- B. Section Includes, but is not limited to:
  - 1. Metal suspension systems.
  - 2. Trim and accessories.
- C. Related Sections:
  - 1. Section 05 4000 – Cold-Formed Metal Framing
  - 2. Section 09 2982 – Gypsum Board
  - 3. Section 09 5100 – Acoustical Ceilings
  - 4. Section 09 9000 – Painting and Coating

**1.02 REFERENCES**

- A. American Society for Testing and Materials (ASTM):
  - 1. A635 - Standard Specification for Sheet Steel.
  - 2. A641 - Standard Specification for Zinc-Coated Carbon Steel Wire
  - 3. C754 - Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Board.
  - 4. C1002 - Specification for Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases.
  - 5. E119 - Standard Test Methods for Fire Tests of Building Construction and Materials
- B. Association References:
  - 1. Gypsum Association GA 216, "Recommended Specifications for the Application and Finishing of Gypsum Board"
  - 2. Comply with "Specifications for Metal Lathing and Furring" published by the Metal Lath/Steel Framing Association.

**1.03 SYSTEM DESCRIPTION**

- A. Design Requirements: Fabricate and install systems as indicated but not less than that required to comply with ASTM C754 under the following conditions:
  - 1. Interior suspended ceilings and soffits: Maximum deflection of 1/360 of distance between supports.
  - 2. Exterior soffits: Withstand minimum positive and negative pressure of 20 psf with maximum deflection of 1/360 of distance between supports.
  - 3. Fire Resistance Ratings: Where fire resistance classifications are indicated, provide materials and application procedures identical to those listed by UL or tested according to ASTM E119 for type of construction shown.

**1.04 SUBMITTALS**

- A. Product Data: Submit product data sheets on the following materials. Data sheets shall be marked to indicate the product and sizes used.
  - 1. Metal Framing and Furring Materials

**1.05 QUALITY ASSURANCE**

- A. Qualifications:
  - 1. Single Source Responsibility:
    - a. Obtain metal framing from a single manufacturer.
- B. Reference Standards:
  - 1. Applicable requirements of ASTM C754 for installation of steel framing.

## **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with requirements of Section 01 6000 – Product Requirements.
- B. Acceptance at Site
  - 1. Deliver material to site promptly without undue exposure to weather.
  - 2. Deliver in manufacturer's unopened containers or bundles, fully identified with name, brand, type and grade.
- C. Storage and Protection
  - 1. Protect materials from contamination, dampness, freezing, or overheating in accordance with manufacturer's instructions.
  - 2. Store above ground in dry, ventilated space.
  - 3. Protect materials from soiling, rusting and damage.

## **1.07 PROJECT CONDITIONS**

- A. Project Environmental Requirements
  - 1. Comply with requirements of referenced standards and recommendations of material manufacturers for environmental conditions before, during, and after installation.
  - 2. Maintain illumination as required for proper installation of material.

## **1.08 WARRANTY**

- A. Comply with requirements of Section 01 7800 – Closeout Submittals.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Subject to compliance with requirements indicated herein, provide products of one of the listed manufacturers.
- B. Suspension Systems:
  - 1. Armstrong World Industries, Inc: [www.armstrong.com](http://www.armstrong.com).
  - 2. CertainTeed Corporation: [www.certainteed.com](http://www.certainteed.com).
  - 3. USG: [www.usg.com](http://www.usg.com).
  - 4. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 CEILING AND SOFFIT SUPPORT MATERIALS**

- A. Hanger Anchorage Devices: Screws, clips, bolts or other devices compatible with indicated structural anchorage for ceiling hangers and whose suitability has been proven through standard construction practices or by certified test data.
- B. Hangers
  - 1. Grade: Steel wire or rods, sizes to comply with requirements of ASTM C754 for ceiling or soffit area and loads to be supported.
    - a. Wire: ASTM A 641, soft, Class 1 galvanized.
    - b. Rods and flats: Mild steel components.
  - 2. Finish: Galvanized or painted with rust-inhibitive paint for interior Work; galvanized for exterior Work.
- C. Framing System
  - 1. Grade: Framing system for gypsum board panels consisting of cold-rolled steel members conforming to ASTM C635.
  - 2. Finish: Exposed surfaces finished in manufacturer's standard enamel paint finish.
  - 3. Fire Rating: Rating in accordance with U.L. assembly as indicated on the drawings.
  - 4. Components: Main tees, furring cross channels, furring cross tees, and cross tees.
    - a. Main Tees: Heavy Duty classification 1-1/2" high x 144" long, integral reversible splice with knurled face. (Fire rated where required).

- b. Cross Members: Members with knurled face. Cross Tees: 1-1/2" high x 48" long with 1-1/2" wide face; quick release cross tee ends for positive locking and removability without tools. (Fire rated where required).
  - c. Accessory Cross Tees: Cross tees must have knurled faces and quick release cross tee ends for positive locking and removability without tools.
- 5. Accessories:
  - a. U-shaped perimeter channel molding.
  - b. Galvanized carbon steel (12 ga.) hanger wire.
- D. Hanger Wire Sound Isolators: Provide where indicated for sound-rated suspended ceilings.
- E. Miscellaneous Accessories: Provide as required for complete installations.

### **PART 3 - EXECUTION**

#### **3.01 GENERAL INSTALLATION REQUIREMENTS**

- A. Install in accordance with reference standards and manufacturer's instructions.
- B. Tolerances:
  - 1. Do not exceed 1/8 inch in 8'-0" variation from plumb or level in exposed lines of surface, except at joints between gypsum board units.
  - 2. Do not exceed 1/16 inch variation between planes of abutting edges or ends.
  - 3. Shim as required to comply with specified tolerances.
- C. Install framing to comply with ASTM C754 and with ASTM C840 requirements that apply to framing installation.

#### **3.02 EXAMINATION**

- A. Site Verification of Conditions:
  - 1. Examine substrates and adjoining construction and conditions under which Work is to be installed. Do not proceed with Work until unsatisfactory conditions are corrected.

#### **3.03 INSTALLATION**

- A. Comply with provisions of Section 01 7000 – Execution and Closeout Requirements.

#### **3.04 METAL SUPPORT INSTALLATION**

- A. Ceiling Support Systems
  - 1. Secure hangers or rods to structural support by connecting directly to structure where possible; otherwise connect to inserts, clips or other anchorage devices or fasteners indicated.
  - 2. Space main runners, hangers and furring according to requirements of ASTM C754, except as otherwise indicated.
  - 3. Where spacing of structural members, or width of ducts or other equipment, prevents regular spacing of hangers, provide supplemental hangers and suspension members and reinforce nearest affected hangers to span extra distance.
  - 4. Attach directly to structural elements only, do not attach to metal deck. Loop hangers and wire-tie directly or provide anchors or inserts.

#### **3.05 ADJUSTING**

- A. Correct damage and defects which may telegraph through finished work.
- B. Leave Work smooth and uniform.

#### **3.06 CLEANING**

- A. Comply with requirements of Section 01 7000 – Execution and Closeout Requirements.
- B. At completion of each segment of installation in a room or space, promptly pick up and remove from the working area all scrap, debris, and surplus material of this Section.

**END OF SECTION**





**SECTION 09 2236**  
**LATH**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Metal lath for cement plaster.
- B. Furring for metal lath.
- C. Metal ceiling framing.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 4000 - Cold-Formed Metal Framing: Sheathing on exterior walls.
- B. Section 07 2500 - Weather Barriers: Weather barrier under exterior plaster and stucco.
- C. Section 09 2400 - Cement Plastering.

**1.03 REFERENCE STANDARDS**

- A. ASTM C841 - Standard Specification for Installation of Interior Lathing and Furring 2023.
- B. ASTM C847 - Standard Specification for Metal Lath 2018.
- C. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness 2022.
- D. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs 2022.
- E. ASTM C1063 - Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster 2023.
- F. ASTM C1787 - Standard Specification for Installation of Non Metallic Plaster Bases (Lath) Used with Portland Cement Based Plaster in Vertical Wall Applications 2023.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on furring and lathing components, structural characteristics, material limitations, and finish.

**1.05 QUALITY ASSURANCE**

- A. Maintain one copy of each installation standard referenced on site throughout the duration of lathing and plastering work.
- B. Installer Qualifications: Company specializing in performing the work of this section with at least five years of documented experience.
- C. Mock-ups
  - 1. Lath and plaster an actual wall surface for each finish specified to show color, texture, and workmanship. Provide mock-ups of at least 100 sq. ft. Obtain the Architect's approval of mock-up locations.
  - 2. Simulate finished lighting conditions for the Architect's review of mock-up.
  - 3. Do not start plastering until the Architect approves mock-up. Provide additional mock-ups if necessary to obtain approval. Do not alter mock-ups until plastering is completed.
  - 4. The mock-ups may be part of the Work, and may be incorporated into the finished Work when so approved by the Architect.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Metal Lath and Accessories:
  - 1. Cemco: [www.cemcosteel.com](http://www.cemcosteel.com).

2. Clarkwestern Dietrich Building Systems LLC: [www.clarkdietrich.com](http://www.clarkdietrich.com).
3. Milcor Corporation: [www.milcorlp.com](http://www.milcorlp.com).
4. National Gypsum Company: [www.national-gypsum.com](http://www.national-gypsum.com).
5. Niles Building Products: [www.nilesbldg.com](http://www.nilesbldg.com).
6. United States Gypsum Company (USG): [www.usg.com](http://www.usg.com).

## **2.02 FRAMING AND LATH ASSEMBLIES**

- A. Provide completed assemblies with the following characteristics:
  1. Maximum Deflection of Vertical Assemblies: 1:360 under lateral point load of 100 lbs.
  2. Maximum Deflection of Horizontal Assemblies: 1:240 deflection under dead loads and wind uplift.
- B. Fire Rated Assemblies: Provide components complying with requirements for fire rated assemblies specified in the section where the plaster finish is specified.

## **2.03 FRAMING MATERIALS**

- A. Furring Channels: Formed steel, minimum 0.05 inch thick, 3/8 inch deep by 3/4 inch high, splicing permitted; galvanized.
- B. Main Ceiling Channels: Formed steel, asphalt coated, minimum 0.05 inch thick, 3/4 inch deep by 1-1/2 inch high, single piece, no splicing; galvanized.
- C. Hangers: Steel wire, of size and type to suit application, to support ceiling components in place to deflection limits as indicated.
- D. Ceiling Hangers: Rolled steel sections, of size and type to suit application, to rigidly support ceiling components in place to deflection limits as indicated; galvanized.
- E. Lateral Bracing: Formed steel, minimum 0.060 inch thick, size and length as required; galvanized.

## **2.04 LATH**

- A. Diamond Mesh Metal Lath: ASTM C847, galvanized; self-furring.
  1. Weight: To suit application comply with deflection criteria and as specified in ASTM C841 or ASTM C1063 for framing spacing.
  2. Weight: 3.4 lb/sq yd.
- B. Corner Mesh: Formed sheet steel, minimum 0.018 inch thick, expanded flanges shaped to permit complete embedding in plaster, minimum 2 inch size; same finish as lath.
- C. Strip Mesh: Expanded metal lath, same weight as lath, 2 inch wide by 24 inch long; same finish as lath.
- D. Beads, Screeds, Joint Accessories, and Other Trim: Depth governed by plaster thickness, and maximum possible lengths.
  1. Material: Formed zinc, expanded metal flanges.
  2. Casing Beads with Weep Holes: Square edges.
  3. Corner Beads: Radius corners.
  4. Base Screeds: Bevelled edges.
  5. Expansion Joints: Accordion profile with factory-installed protective tape, 2 inch wide flanges.
  6. Control Joints: Accordion profile with factory-installed protective tape, 2 inch flanges.
  7. Soffit Vents: Continuous one-piece Soffit Vent with reinforcing rib to key into stucco and plaster.
  8. Reveal Molding: Profile and size as noted on the drawings and as required for the specific application.

## **2.05 ACCESSORIES**

- A. Access Panels: As specified in Section 08 3100.

- B. Anchorage: Tie wire, nails, and other metal supports, of type and size to suit application; to rigidly secure materials in place, minimum G90, hot dipped galvanized.
- C. Fasteners: Self-piercing tapping screws; ASTM C1002 or ASTM C954.
- D. Tie Wire: Annealed galvanized steel.
- E. Felt Bond Breaker: Asphalt impregnated felt building paper, equivalent to two layers Grade "D" paper as required by Code.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that substrates are ready to receive work and conditions are suitable for application.
- C. Do not begin until unacceptable conditions have been corrected.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### **3.02 INSTALLATION - GENERAL**

- A. Install metal lath and furring for Portland cement plaster in accordance with ASTM C1063.
- B. Install lath and furring for fire-rated assemblies in accordance with requirements of assembly as indicated.

### **3.03 WALL FURRING INSTALLATION**

- A. Install wall furring by directly attaching to masonry and concrete walls.
- B. Install furring channels horizontally; secure with fasteners on alternate channel flanges at maximum 16 inches on center.
- C. Space furring channels maximum 16 inches on center, and not more than 4 inches away from floor and ceiling lines.

### **3.04 CEILING AND SOFFIT FRAMING INSTALLATION**

- A. Install furring after work above ceiling or soffit is complete. Coordinate the location of hangers with other work.
- B. Install furring independent of walls, columns, and above-ceiling work.
- C. Securely anchor hangers to structural members or embed in structural slab. Space hangers as required to limit deflection to criteria indicated. Use rigid hangers at exterior soffits.
- D. Space main carrying channels at maximum 24 inch on center, and not more than 6 inches from wall surfaces. Lap splice securely.
- E. Securely fix carrying channels to hangers to prevent turning or twisting and to transmit full load to hangers.
- F. Install furring channels perpendicular to carrying channels at 8" on center, not more than 2 inches from perimeter walls, and rigidly secure. Lap splices securely.
- G. Reinforce openings in suspension system that interrupt main carrying channels or furring channels with lateral channel bracing. Extend bracing minimum 24 inches past each opening.
- H. Laterally brace suspension system.

### **3.05 CONTROL AND EXPANSION JOINT INSTALLATION**

- A. Locate joints as indicated on drawings and comply with ASTM C1063.
- B. Install expansion joints where an expansion joint occurs in base exterior wall.
- C. Install prefabricated joint accessories in accordance with ASTM C1063.
- D. Construct expansion joints and control joints of back-to-back casing beads with a backer rod and sealant, set 1/4 inch apart. Lath to be cut at these joints in accordance with ASTM C1063.

- E. Install control joints at bulkheads as shown on the drawings but in no case shall they exceed 15'-0" on center, height to length ratio of 2.5, or 144 square feet max area per Code or as indicated on the drawing. Contractor shall be responsible to insure that bulkheads comply with this requirement and shall coordinate locations with the architect if not shown on the drawings.
- F. At walls, install control joints within long runs of partitions at approximately 30'-0" on center or as indicated on the drawing.

### **3.06 ACCESS PANELS INSTALLATION**

- A. Install access panels and rigidly secure in place.
- B. Install frames plumb and level in opening. Secure rigidly in place.
- C. Position to provide convenient access to concealed work requiring access.

### **3.07 LATH INSTALLATION**

- A. Apply lath taut, with long dimension perpendicular to supports.
- B. Lap or nest ends of metal lath in accordance with ASTM C841.
- C. Lap ends of non-metallic lath in accordance with ASTM C1787.
- D. Attach metal lath to metal supports using tie wire at maximum 6 inches on center.
- E. Attach metal lath to concrete using wire loops. Attach anchors to backup surface; space at maximum 24 inches on center. In accordance with ASTM C1063, accessories must be attached 7" o.c. max; provide zee furring over concrete and CMU unless otherwise noted.
- F. Continuously reinforce internal angles with corner mesh, except where the metal lath returns 3 inches from corner to form the angle reinforcement; fasten at perimeter edges only.
- G. Place corner bead at external wall corners; fasten at outer edges of lath only.
- H. Place perforated casing beads or weep screeds at termination of plaster areas; secure rigidly in place.
- I. Place lath vertically above each top corner and each side of door frames to 6 inches above ceiling line.
- J. Place casing beads at terminations of plaster finish. Butt and align ends. Secure rigidly in place.
- K. Place additional strip mesh diagonally at corners of lathed openings. Secure rigidly in place.
- L. Install foundation weep screeds at the bottom of exterior walls so it extends below the floor line where the wall is supported by a floor or a foundation. Through wall flashing shall be provided behind foundation weep screed.

### **3.08 TOLERANCES**

- A. Maximum Variation from True Lines and Levels: 1/8 inch in 10 feet.
- B. Maximum Variation from True Position: 1/8 inch.

**END OF SECTION**

**SECTION 09 2400  
CEMENT PLASTERING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Cement plaster for installation over metal lath, masonry, concrete, and solid surfaces.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 4000 - Cold-Formed Metal Framing: Structural metal framing for plaster.
- B. Section 06 1000 - Rough Carpentry: Wood stud framing for plaster.
- C. Section 09 2236.23 - Metal Lath: Metal furring and lathing for plaster.

**1.03 REFERENCE STANDARDS**

- A. ASTM C926 - Standard Specification for Application of Portland Cement-Based Plaster 2023.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittals procedures.
- B. Product Data: Provide data on plaster materials, characteristics and limitations of products specified.
- C. Samples: Submit two samples, 6 by 6 inch in size illustrating finish color and texture.
- D. Closeout Submittals:
  - 1. Submit under provisions of Section 01 7800 – Closeout Submittals.
  - 2. Submit Material Safety Data Sheets under provisions of Section 01 7800 – Closeout Submittals for the following items:
    - a. Sprayed-on or troweled-on fireproofing or decorative finish.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications:
  - 1. Minimum of twenty (20) years experience in manufacture of stucco products.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.
  - 1. Employ skilled mechanics that are experienced and knowledgeable in cement stucco application, and familiar with the requirements of the specified work.
  - 2. Successful completion of minimum of ten (10) projects of similar size and complexity to the specified project.
  - 3. Provide the proper equipment, manpower and supervision on the job site to install the system in compliance with manufacturer's published specifications and details and the project plans and specifications.
- C. Pre-installation Meetings
  - 1. Comply with provisions of Section 01 3000 – Administrative Requirements.
- D. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

**1.06 MOCK-UP**

- A. Lath and plaster an actual wall surface for each finish specified to show color, texture, and workmanship. Provide mock-ups of at least 100 sq. ft. Obtain the Architect's approval of mock-up locations.
- B. Simulate finished lighting conditions for the Architect's review of mock-up.
- C. Do not start plastering until the Architect approves mock-up. Provide additional mock-ups if necessary to obtain approval. Do not alter mock-ups until plastering is completed.
- D. Locate where directed.

- E. Accepted mock-up may remain as part of the Work.

#### **1.07 FIELD CONDITIONS**

- A. Do not apply plaster when substrate or ambient air temperature is under 50 degrees F or over 80 degrees F.
- B. Maintain minimum ambient temperature of 50 degrees F during installation of plaster and until cured.

#### **1.08 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide a warrantable assembly.
- C. Correct defective Work within a seven year period after Date of Substantial Completion.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Subject to compliance with requirements indicated herein, provide products of one of the listed manufacturers.
  - 1. BASF Finestone: [www.Finestone.BASF.com](http://www.Finestone.BASF.com).
  - 2. Parex USA, Inc.: [www.parexusa.com](http://www.parexusa.com).
  - 3. STO Corporation: [www.stocorp.com](http://www.stocorp.com).
  - 4. TXI – Lone Star: [www.txi.com](http://www.txi.com).
  - 5. Substitutions: Under provisions of Section 01 6000 – Product Requirements

#### **2.02 CEMENT PLASTER ASSEMBLIES**

- A. Interior/Exterior Stucco: Cement plaster system, made of finish, brown, and scratch coat and reinforcing mesh.

#### **2.03 PLASTER MATERIALS**

- A. Premixed Scratch and Brown: Mixture of cement, aggregate, and proprietary admixtures for scratch and brown coats, installed in accordance with ASTM C926.
- B. Water: Clean, fresh, potable and free of mineral or organic matter that could adversely affect plaster.
- C. Admixture: Use stucco base manufacturer's listed admixture.
- D. Primer (required): Acrylic primer by the finish coat manufacturer.
- E. Finish Coat: Integrally colored acrylic type, color as selected.
  - 1. For finish coat: As selected from the manufacturers full range of color.
    - a. BASF Finestone Pebbletex or Aggrelastic Finishes.
    - b. Parex USA DPR or Elastic Finishes.
    - c. STO Stolit Acrylic or Aggrelastic Finishes.
    - d. Substitutions: See Section 01 6000 - Product Requirements.
- F. Bonding Agent: ASTM C 932; type recommended for bonding plaster to concrete and concrete masonry surfaces .

#### **2.04 METAL LATH**

- A. Metal Lath: Felt behind plaster and Accessories: In accordance with ASTM C1063 and as specified in Section 09 2236.23.
- B. Beads, Screeds, and Joint Accessories: In accordance with ASTM C1063 and as specified in Section 09 2236.23.

#### **2.05 WEATHER BARRIER**

- A. As specified in Section 07 2500 – Weather Barriers.

## **2.06 PLASTER MIXES**

- A. Over Solid Bases: Three-coat application, mixed and proportioned in accordance with ASTM C926.
- B. Over Metal Lath: Three-coat application, mixed and proportioned in accordance with ASTM C926.
- C. Mix only as much plaster as can be used prior to initial set.
- D. Mix materials dry, to uniform color and consistency, before adding water.
- E. Add air entrainment admixtures to all coats to provide 5-7 percent entrainment.
- F. Protect mixtures from freezing, frost, contamination, and excessive evaporation.
- G. Do not retemper mixes after initial set has occurred.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify the suitability of existing conditions before starting work.
- B. Masonry: Verify joints are cut flush and surface is ready to receive work of this section. Verify no bituminous or water repellent coatings exist on masonry surface.
- C. Concrete: Verify surfaces are flat, honeycomb are filled flush, and surfaces are ready to receive work of this section. Verify no bituminous, water repellent, or form release agents exist on concrete surface that are detrimental to plaster bond.
- D. Metal Lath and Accessories: Verify lath is flat, secured to substrate, and joint and surface perimeter accessories are in place.
- E. Mechanical and Electrical: Verify services within walls have been tested and approved.

### **3.02 PREPARATION**

- A. Dampen masonry surfaces to reduce excessive suction.
- B. Clean concrete surfaces of foreign matter. Clean surfaces using acid solutions, solvents, or detergents. Wash surfaces with clean water.
- C. Roughen smooth concrete surfaces and apply bonding agent in accordance with manufacturer's instructions.

### **3.03 PLASTERING**

- A. Apply premixed plaster in accordance with manufacturer's instructions.
- B. Apply plaster in accordance with ASTM C926.
- C. Control Joint Installation:
  - 1. Joint spacing shall not be greater than 18 feet.
  - 2. No panel shall exceed 144 sq.ft. on vertical applications.
  - 3. No panel shall exceed 100 sq.ft. over curved or angular sections.
  - 4. No length-to-width ratio shall exceed 2 ½ to 1 in any given panel.
- D. Installation over cast-in-place concrete or concrete masonry units:
  - 1. Concrete and concrete masonry units require minimum 28-day cure before the installation of stucco. The requirement for a control joint every 144 sq.ft. may be waived on solid substrates without metal lath such as cast-in-place concrete and concrete masonry units provided joints in the supporting construction exist at appropriate intervals and they are reflected in the stucco. In such cases joint spacing in the stucco shall not exceed 250 sq.ft.
  - 2. Pre-moisten concrete masonry units and absorbent concrete prior to the placement of stucco.

3. Scratch Coat: apply the stucco with sufficient pressure to ensure intimate contact with the substrate and complete coverage to an approximate thickness of 1/4 inch. Score the stucco upon completion of each panel in preparation for a second coat. Score horizontally.
  4. Moist cure after the stucco has set by lightly fogging the surface for at least 48-hours (unless brown coat is applied as soon as the scratch coat has achieved sufficient rigidity to support the brown coat). Fog as frequently as required during the 48-hour period to prevent loss of moisture from the stucco. Avoid eroding the stucco surface with excess moisture. If relative humidity exceeds 75% the frequency of moist-curing can be diminished.
  5. Brown Coat: As soon as the first coat is firm enough to receive the second coat without damage, apply the second coat with sufficient pressure to ensure intimate contact with the first coat to an approximate thickness of 1/8 or 1/4 inch and as needed to bring the stucco to the desired thickness. Use a rod or straight edge to bring the surface to a true, even plane. Fill depressions in plane with stucco.
  6. After the stucco has lost sufficient moisture so that the surface sheen has disappeared, float the surface lightly with a darby or wood float to densify the surface and to provide a smooth, even surface. Float before the stucco becomes so rigid that it cannot be moved beneath the float.
  7. Moist cure after the stucco has set by lightly fogging the surface for at least 48-hours. Fog as frequently as required during the 48-hour period to prevent loss of moisture from the stucco. Avoid eroding the stucco surface with excess moisture. If relative humidity exceeds 75% the frequency of moist-curing can be diminished.
- E. Installation over frame construction with sheathing:
1. Scratch Coat: Apply stucco with sufficient pressure to key into and embed the metal lath. Apply sufficient material, approximately 3/8 inch, to cover the metal lath and to permit scoring the surface. Score the stucco upon completion of each panel in preparation for a second coat. Score horizontally.
  2. Brown Coat: as soon as the first coat is firm enough to receive the second coat without damage, apply the second coat with sufficient pressure to ensure intimate contact with the first coat to an approximate thickness of 1/8, 1/4 or 3/8 inch as needed to bring the stucco to a uniform thickness that matches the grounds of the accessories. Use a rod or straight edge to bring the surface to a true, even plane. Fill depressions in plane with stucco.
  3. After the stucco has become slightly firm float the surface lightly with a darby or wood float to densify the surface and to provide a smooth, even surface.
  4. Moist cure after the stucco has set by lightly fogging for at least 48 hours.
  5. Fog as frequently as required during the 48 hour period to prevent loss of moisture from the stucco. Avoid eroding the stucco surface with excess moisture. If relative humidity exceeds 75% the frequency of moist curing can be diminished.
- F. After curing, allow to dry the amount of time required by the primer/finish coat manufacturer.
- G. Finish Texture: Float to a consistent finish.
- H. Avoid excessive working of surface. Delay troweling as long as possible to avoid drawing excess fines to surface.

### 3.04 TOLERANCES

- A. Maximum Variation from True Flatness: 1/8 inch in 10 feet.

### 3.05 ADJUSTING

- A. Upon completion of the other work of this Section, inspect all cement plaster surfaces and correct conditions that do not meet specified requirements.
- B. Remove protective materials and plaster materials from adjacent surfaces, and remove stains that would adversely affect finishes.



**3.06 CLEANING**

- A. Comply with requirements of Section 01 7000 – Execution and Closeout Requirements.

**3.07 PROTECTION**

- A. Protect work so that it will be without any evidence of damage or use at time of acceptance.
- B. Provide protection of installed materials from water infiltration into or behind them.
- C. Provide protection of installed stucco from dust, dirt, precipitation, and freezing.
- D. Provide protection of installed primer and finish from dust, dirt, precipitation, freezing and continuous high humidity until fully dry.

**END OF SECTION**



**SECTION 09 3000  
TILING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Tile for floor applications.
- B. Tile for wall applications.
- C. Trim and accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 04 2000 - Unit Masonry.
- B. Section 05 4000 - Cold-Formed Metal Framing.
- C. Section 07 9200 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.
- D. Section 07 9513 - Expansion Joint Cover Assemblies: Expansion joint components.
- E. Section 09 2116 - Gypsum Board Assemblies: Tile backer board.

**1.03 REFERENCE STANDARDS**

- A. ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium) 2019.
  - 1. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar 2017 (Reaffirmed 2022).
  - 2. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar 2017.
  - 3. ANSI A108.1c - Contractor's Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar 1999 (Reaffirmed 2021).
  - 4. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesive or Water Cleanable Tile-Setting Epoxy Adhesive 2019.
  - 5. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar 2021.
  - 6. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grout Epoxy 1999 (Reaffirmed 2019).
  - 7. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout 1999 (Reaffirmed 2019).
  - 8. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout 1999 (Reaffirmed 2019).
  - 9. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework 2017 (Reaffirmed 2022).
  - 10. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units 2018.
  - 11. ANSI A108.12 - American National Standard for Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar 1999 (Reaffirmed 2019).
  - 12. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone 2005 (Reaffirmed 2021).
  - 13. ANSI A118.1 - American National Standard Specifications for Dry-Set Cement Mortar 2019.

14. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive 2021.
  15. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar 2019.
  16. ANSI A118.7 - American National Standard Specifications for High Performance Cement Grouts for Tile Installation 2019.
  17. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone 2014 (Reaffirmed 2019).
  18. ANSI A136.1 - American National Standard Specifications for Organic Adhesives for Installation of Ceramic Tile 2020.
  19. ANSI A137.1 - American National Standard Specifications for Ceramic Tile 2022.
  20. ASTM C373 - Standard Test Methods for Determination of Water Absorption and Associated Properties by Vacuum Method for Pressed Ceramic Tiles and Glass Tiles and Boil Method for Extruded Ceramic Tiles and Non-tile Fired Ceramic Whiteware Products 2018 (Reapproved 2023).
- B. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring 2022.
- C. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride 2023.
- D. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation 2023.

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

#### **1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
- C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, and setting details.
- D. Samples: Mount tile and apply grout on two plywood panels, minimum 12 by 12 inches in size illustrating pattern, color variations, and grout joint size variations.
- E. Grout: Submit manufacturer's full range of standard and designated color samples for each type of grout for Architect's selection.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- G. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.
- H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
1. See Section 01 6000 - Product Requirements, for additional provisions.
  2. Extra Tile: 1 percent of each size, color, and surface finish combination.
  3. Store in location as directed by Owner.
  4. All attic stock to be placed on pallets, shrink-wrapped, and clearly marked with campus. Attic stock to be delivered to TISD Warehouse, with transmittal, and verified with Owner upon delivery. Owner-signed transmittal to be included in close-out documents.

#### **1.06 QUALITY ASSURANCE**

- A. Maintain one copy of and ANSI A108/A118/A136 and TCNA (HB) on site.
- B. Manufacturer Qualifications:

1. Tile: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.
  2. Setting Materials: Minimum ten years experience in manufacturing the types of setting and grout materials specified.
  3. Membrane: Minimum five years experience in manufacturing the types of membrane materials specified.
- C. Installer Qualifications: Company specializing in performing tile installation, with minimum of five years of documented experience.

#### **1.07 MOCK-UP**

- A. See Section 01 4000 - Quality Requirements, for general requirements for mock-up.
- B. Construct tile mock-up where determined by the Architect, incorporating all components specified for the location.
1. Minimum size of mock-up is full height of wall, 6'-0" long or as determined by the Architect to incorporate all components. More than one mock-up may be required to demonstrate all materials in the project.
  2. Mock-up shall be approved by the Architect or Architect's representative. Approved mock-up may remain as part of the Work.

#### **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

#### **1.09 FIELD CONDITIONS**

- A. Do not install solvent-based products in an unventilated environment.
- B. Maintain ambient and substrate temperature of no less than 50 degrees F and no more than 100 degrees F during installation of mortar materials.

#### **1.10 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Submit a written warranty, executed by the Contractor, Installer, and Manufacturer, agreeing to repair or replace tile that fails in materials or workmanship within the specified warranty period.
1. Warranty Period: One (1) year after date of Substantial Completion.

### **PART 2 PRODUCTS**

#### **2.01 TILE**

- A. Manufacturers: All products by the same manufacturer.
1. American Olean Corporation: [www.americanolean.com/#sle](http://www.americanolean.com/#sle).
  2. Arizona Tile: [www.arizonatile.com](http://www.arizonatile.com).
  3. Concept Surfaces: [www.conceptsurfaces.com](http://www.conceptsurfaces.com).
  4. Crossville Inc.: [www.crossvilleinc.com](http://www.crossvilleinc.com).
  5. Dal-Tile Corporation: [www.daltile.com/#sle](http://www.daltile.com/#sle).
  6. Emser Tile, LLC: [www.emser.com/#sle](http://www.emser.com/#sle).
  7. Horizon Italian Tile: [www.horizontile.com](http://www.horizontile.com).
  8. Pantheon: [pantheontile.com](http://pantheontile.com).
  9. Substitutions: See Section 01 6000 - Product Requirements.
- B. Mosaic Tile: ANSI A137.1, standard grade.
1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
  2. Size: As scheduled.
  3. Shape: Square.
  4. Edges: Square.
  5. Surface Finish: Matte glazed.
  6. Product and Color(s): See drawings for Schedule of Materials and Colors.
  7. Mounted Sheet Size: 12 by 12 inches.

8. Trim Units: Matching bead, cove, and surface bullnose shapes in sizes indicated.
- C. Ceramic Tile: ANSI A137.1, standard grade.
  1. Moisture Absorption: 7.0 to 20.0 percent as tested in accordance with ASTM C373.
  2. Size: As scheduled.
  3. Edges: Square.
  4. Surface Finish: Matte glaze.
  5. Product and Color(s): See drawings for Schedule of Materials and Colors.
  6. Trim Units: Matching bead, bullnose, cove, and base shapes in sizes indicated.
- D. Quarry Tile: ANSI A137.1, standard grade.
  1. Moisture Absorption: 0.5 to 3.0 percent as tested in accordance with ASTM C373.
  2. Size: As scheduled.
  3. Thickness: 1/2 inch, nominal.
  4. Edges: Square.
  5. Surface Finish: Matte glazed.
  6. Provide 3/16" grout joints at quarry tile locations.
  7. Product and Color(s): See drawings for Schedule of Materials and Colors.
  8. Trim Units: Matching bullnose, cove, cove base, and window sill or step nosing shapes in sizes indicated.
- E. Porcelain Tile: ANSI A137.1, standard grade.
  1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
  2. Size: As scheduled.
  3. Thickness: 3/8 inch.
  4. Edges: Square.
  5. Surface Finish: Matte glazed.
  6. Product and Color(s): See drawings for Schedule of Materials and Colors.
  7. Trim Units: Matching bullnose, double bullnose, cove base, cove, and window sill or step nosing shapes in sizes indicated.
  8. Provide Large Format Tile mortar as required according to manufacturer's recommendation.

## **2.02 TRIM AND ACCESSORIES**

- A. Trim: Matching bullnose, cove base, and window sill or step nosing shapes in sizes coordinated with field tile.
  1. Applications:
    - a. Open Edges: Bullnose.
    - b. Inside Corners: Jointed.
    - c. Floor to Wall Joints: Cove base.
  2. Manufacturers: Same as for tile.
- B. Trim: Brushed stainless steel, style and dimensions to suit application, for setting using tile mortar or adhesive.
  1. Applications:
    - a. Wall corners, outside.
      - 1) Roll formed 304 (1.4301 = V2A) (EB) brushed stainless steel, perforated anchoring leg, square outer corner with 1/4" radius along the surface edge.
      - 2) Equal to Schluter - QUADDEC.
      - 3) Size: As required for tile.
      - 4) Accessories:
        - (a) Outside Corner Endcap
        - (b) Connector (stainless steel)
    - b. Wall edges, top.

- 1) L-shaped profile with 1/8" wide top section and vertical wall section that together form the visible surface, integrated trapezoid-perforated anchoring leg, and integrated grout joint spacer.
- 2) Material and Finish: EB - Brushed Stainless Steel Type 304 = V2A.
- 3) Equal to Schluter - SCHIENE.
- 4) Size: As required for tile.
- 5) Accessories:
  - (a) Outside Corner Endcap
  - (b) Connector (stainless steel)
- c. Floor to wall joints when coved base is not available.
  - 1) Roll formed 304 (1.4301 = V2A) (EB) brushed stainless steel profile with integrated trapezoid-perforated anchoring legs, connected at a 90 degree angle by a core-shaped section with 3/8 inch radius that forms the visible surface.
  - 2) Equal to Schluter DILEX-EHK.
  - 3) Size: As required for tile.
  - 4) Accessories:
    - (a) Outside Corner (90 degrees)
    - (b) Inside Corner, 2-way (90 degrees)
    - (c) Connector
    - (d) End Cap
  - d. Borders and other trim as indicated on drawings.
2. Manufacturers:
  - a. Schluter-Systems: [www.schluter.com/#sle](http://www.schluter.com/#sle).
  - b. Substitutions: See Section 01 6000 - Product Requirements.
- C. Thresholds: Marble, solid surface or other material as indicated on the drawings; color as selected, honed finish; 2 inches wide by full width of wall or frame opening; 1/2 inch thick; beveled on long edge with radiused corners on top side; without holes, cracks, or open seams.

## **2.03 SETTING MATERIALS**

- A. Manufacturers:
  1. ARDEX Engineered Cements: [www.ardexamericas.com](http://www.ardexamericas.com).
  2. Bostik Inc: [www.bostik-us.com](http://www.bostik-us.com).
  3. Custom Building Products: [www.custombuildingproducts.com](http://www.custombuildingproducts.com).
  4. LATICRETE International, Inc: [www.laticrete.com](http://www.laticrete.com).
  5. Mapei Corporation: [www.mapei.com](http://www.mapei.com).
  6. Merkrete, by Parex USA, Inc: [www.merkrete.com/sle](http://www.merkrete.com/sle).
  7. TEC, an H.B. Fuller Construction Products Brand: [www.tecspecialty.com/#sle](http://www.tecspecialty.com/#sle).
  8. Substitutions: See Section 01 6000 - Product Requirements.
- B. Provide setting materials made by the same manufacturer as grout.
- C. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4.
  1. Applications: Use this type of bond coat where indicated and in thick-set applications.
- D. Epoxy Adhesive and Mortar Bond Coat: ANSI A118.3.
  1. Applications: Use bonding tile to steel substrates.
- E. Organic Adhesive: ANSI A136.1, thinset mastic type.
  1. Applications: Use for shower floors and walls.
  2. Use Type I in areas subject to prolonged moisture exposure.
- F. Dry-Set Portland Cement Mortar Bond Coat: ANSI A118.1.
  1. Applications: Use in thin-set applications.
- G. Mortar Bed Materials: Pre-packaged mix of Portland cement, sand, latex additive, and water.

## 2.04 GROUTS

- A. Manufacturers:
  - 1. ARDEX Engineered Cements: [www.ardexamericas.com](http://www.ardexamericas.com).
  - 2. Bostik Inc: [www.bostik-us.com](http://www.bostik-us.com).
  - 3. Custom Building Products: [www.custombuildingproducts.com](http://www.custombuildingproducts.com).
  - 4. LATICRETE International, Inc: [www.laticrete.com](http://www.laticrete.com).
  - 5. Mapei Corporation: [www.mapei.com](http://www.mapei.com)
  - 6. Merkrete, by Parex USA, Inc: [www.merkrete.com/sle](http://www.merkrete.com/sle).
  - 7. TEC, an H.B. Fuller Construction Products Brand: [www.tecspecialty.com/#sle](http://www.tecspecialty.com/#sle).
  - 8. Substitutions: See Section 01 6000 - Product Requirements.
- B. High Performance Polymer Modified Grout: ANSI A118.7 polymer modified cement grout.
  - 1. Applications: Use this type of grout where indicated and where no other type of grout is indicated.
  - 2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
  - 3. Color(s): As selected by Architect from manufacturer's full line.
- C. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
  - 1. Applications: Provide at all food preparation areas.
  - 2. Color(s): As selected by Architect from manufacturer's full line.

## 2.05 MAINTENANCE MATERIALS

- A. Tile Sealant: Gunnable, silicone, siliconized acrylic, or urethane sealant; moisture and mildew resistant type.
  - 1. Applications: Between tile and plumbing fixtures.
  - 2. Color(s): As selected by Architect from manufacturer's full line.
  - 3. Products:
    - a. ARDEX Engineered Cements: [www.ardexamericas.com](http://www.ardexamericas.com).
    - b. Custom Building Products: [www.custombuildingproducts.com](http://www.custombuildingproducts.com).
    - c. LATICRETE International, Inc: [www.laticrete.com](http://www.laticrete.com).
    - d. Mapei Corporation: [www.mapei.com](http://www.mapei.com)
    - e. Merkrete, by Parex USA, Inc: [www.merkrete.com/sle](http://www.merkrete.com/sle).
    - f. Substitutions: See Section 01 6000 - Product Requirements.
- B. Grout Sealer: Liquid-applied, moisture and stain protection for existing or new portland cement grout.
  - 1. Composition: Water-based penetrating sealer.
  - 2. Products: As recommended by the grout manufacturer.

## 2.06 ACCESSORY MATERIALS

- A. Waterproofing Membrane: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
  - 1. Fluid or Trowel Applied Type:
    - a. Apply under all tile floors, and all floor penetrations including but not limited to floor drains and pipe penetrations as well as floor to wall intersections. Provide backer rod at floor to wall intersections and continue membrane 12" minimum up wall surface.
    - b. Thickness: 25 mils, minimum, dry film thickness.
    - c. Products:
      - 1) Basis of Design: Custom Building Products; RedGard Crack Prevention and Waterproofing Membrane: [www.custombuildingproducts.com](http://www.custombuildingproducts.com); or products of one of the following manufactures:
      - 2) ARDEX Engineered Cements: [www.ardexamericas.com/#sle](http://www.ardexamericas.com/#sle).
      - 3) H.B. Fuller Construction Products Inc: [www.tecspecialty.com/#sle](http://www.tecspecialty.com/#sle).
      - 4) LATICRETE International, Inc: [www.laticrete.com/#sle](http://www.laticrete.com/#sle).



- 5) Mapei Corporation: [www.mapei.com](http://www.mapei.com)
  - 6) Merkrete, by Parex USA, Inc: [www.merkrete.com/sle](http://www.merkrete.com/sle).
  - 7) Substitutions: See Section 01 6000 - Product Requirements.
- B. Reinforcing Mesh: 2 by 2 inch size weave of 16/16 wire size; welded fabric, galvanized.
  - C. Deep Cleaning of Existing Tile; where noted on the drawings.
    - 1. Where tile or stone surfaces are scheduled to be "Deep Cleaned", provide a high-alkaline, two part industrial strength cleaner and degreaser for heavily soiled and neglected areas.
    - 2. Products:
      - a. Custom Building Products; Aqua Mix 1 & 2 Deep Clean:  
[www.custombuildingproducts.com](http://www.custombuildingproducts.com)
      - b. Substitutions: See Section 01 6000 - Product Requirements.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.
- C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.
- D. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within the following limits:
  - 1. Moisture Emission Rate: Not greater than 3 lb per 1000 sq ft per 24 hours, test in accordance with ASTM F1869.
  - 2. Alkalinity (pH): Verify pH range of 5 to 9, test in accordance with ASTM F710.
- E. Verify that required floor-mounted utilities are in correct location.

### **3.02 PREPARATION**

- A. Protect surrounding work from damage.
- B. Vacuum clean surfaces and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.
- D. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.
- E. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

### **3.03 INSTALLATION - GENERAL**

- A. Install tile and grout in accordance with applicable requirements of ANSI A108.1A thru A108.13, manufacturer's instructions, and TCNA (HB) recommendations.
- B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
- E. Form internal angles square and external angles bullnosed.
- F. Install ceramic accessories rigidly in prepared openings.
- G. Install non-ceramic trim in accordance with manufacturer's instructions.
- H. Install thresholds where indicated.

- I. Sound tile after setting. Replace hollow sounding units.
- J. Keep control and expansion joints free of mortar, grout, and adhesive.
- K. Where wall or floor tile extends across EJ or CJ provide a 3/8" wide joint to align with the EJ or CJ and fill with sealant to match grout. All joints shall comply with the requirement set in the TCNA Handbook, EJ171 Movement Joint Guidelines for Ceramic, Glass and Stone.
- L. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- M. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.
- N. At changes in plane, inside corners, and tile-to-tile control joints, use sanded tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

#### **3.04 INSTALLATION - FLOORS - THIN-SET METHODS**

- A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, dry-set or latex-Portland cement bond coat, with standard grout, unless otherwise indicated.
  - 1. Where waterproofing membrane is indicated, install in accordance with TCNA (HB) Method F122, with latex-Portland cement grout.
- B. Install tile-to-tile floor movement joints in accordance with TCNA (HB) Method EJ171F.

#### **3.05 INSTALLATION - FLOORS - MORTAR BED METHODS**

- A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F111, with cleavage membrane, unless otherwise indicated.
  - 1. Where waterproofing membrane is indicated, with standard grout or no mention of grout type, install in accordance with TCNA (HB) Method F121.
- B. Waterproofing Membrane: Install as recommended by manufacturer .
- C. Mortar Bed Thickness: 2 inch, unless otherwise indicated.

#### **3.06 INSTALLATION - SHOWERS AND BATHTUB WALLS**

- A. At tiled shower receptors install in accordance with TCNA (HB) Method B420, mortar bed floor, and W245, thin-set over coated glass mat backer board walls.
- B. Grout with latex-Portland cement grout.

#### **3.07 INSTALLATION - WALL TILE**

- A. Over coated glass mat backer board on studs, install in accordance with TCNA (HB) Method W245.
- B. Over gypsum wallboard on wood or metal studs install in accordance with TCNA (HB) Method W243, thin-set with dry-set or latex-Portland cement bond coat, unless otherwise indicated.
  - 1. Where mortar bed is indicated, install in accordance with TCNA (HB) Method W222, one coat method.
  - 2. Where waterproofing membrane is indicated other than at showers and bathtub walls, install in accordance with TCNA (HB) Method W222, one coat method.
- C. Over interior concrete and masonry install in accordance with TCNA (HB) Method W202, thin-set with dry-set or latex-Portland cement bond coat.

#### **3.08 CLEANING**

- A. Clean tile and grout surfaces.

#### **3.09 PROTECTION**

- A. Do not permit traffic over finished floor surface for 4 days after installation.

#### **3.10 CLOSEOUT ACTIVITIES**

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

- B. See Section 01 7900 - Demonstration and Training, for additional requirements.

**END OF SECTION**



**SECTION 09 5100  
ACOUSTICAL CEILINGS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Suspended metal grid ceiling system.
- B. Suspended metal open grid ceiling system.
- C. Decorative Grid System Trim
- D. Acoustical units.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 3100 - Steel Decking: Placement of special anchors or inserts for suspension system.
- B. Section 07 2100 - Thermal Insulation: Acoustical insulation.
- C. Section 08 3100 - Access Doors and Panels: Access panels.

**1.03 REFERENCE STANDARDS**

- A. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels 2019.
- B. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions 2022.
- C. ASTM E1264 - Standard Classification for Acoustical Ceiling Products 2014.
- D. CISCA (AC) - Acoustical Ceilings: Use and Practice 1999.
- E. UL (FRD) - Fire Resistance Directory Current Edition.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Do not install acoustical units until after interior wet work is dry.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other ceiling finishes, and mechanical and electrical items installed in the ceiling.
- C. Product Data: Provide data on suspension system components and acoustical units.
- D. Samples: Submit two samples 6 by 6 inch in size illustrating material and finish of acoustical units.
- E. Samples: Submit two samples each, 12 inches long, of suspension system main runner, cross runner, and perimeter molding.
- F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- G. Manufacturer's certificate that products meet or exceed specified requirements.
- H. Material Safety Data Sheets under provisions of Section 01 7800 - Closeout Submittals for the following items:
  - 1. All mastics, glues, and adhesives
  - 2. Acoustical ceiling tile
- I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.

2. Extra Acoustical Units: Quantity equal to 5 percent of total installed.

#### **1.06 QUALITY ASSURANCE**

- A. Fire-Resistive Assemblies: Complete assembly listed and classified by UL for the fire resistance indicated.
- B. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- D. Installer Qualifications: An entity experienced in the installation of acoustical ceiling systems similar to requirements for this Project, and acceptable to, or licensed by, acoustical ceiling systems manufacturer.
- E. Comply with the following standards:
  - 1. CISCA (AC) "Acoustical Ceilings: Use and Practice."
  - 2. CISCA (AC) "Guidelines for Seismic Restraint Direct Hung Suspended Ceiling Assemblies."

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with pertinent provisions of Section 01 6000 – Product Requirements.
- B. Deliver acoustical ceiling system components in manufacturer's original unopened packages or containers, with labels intact.
- C. Store all components to provide suitable protection against deleterious effects from exposure to moisture, direct sunlight, or other causes.
- D. Handle all components to preclude damage. Take special precaution to prevent damage to acoustical ceiling unit edges and corners.
- E. Comply with manufacturer's Material Safety Data Sheets (MSDS) for delivery, storage, and handling of components.

#### **1.08 FIELD CONDITIONS**

- A. Maintain uniform temperature of 60 - 85 degrees F, and maximum relative humidity of 70 percent prior to, during, and after acoustical unit installation.
- B. Prior to installation, the following conditions must exist:
  - 1. All windows and exterior doors in place and roof watertight.
  - 2. Work of all wet trades completed and thoroughly dried to installation of any system components.
  - 3. Mechanical and Electrical trades shall have completed their work above ceiling line prior to acoustical ceiling systems installation. Coordinate with Mechanical and Electrical trades prior to start of installation.

#### **1.09 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. The manufacturer shall provide a minimum 15-year acoustical ceiling and suspension system warranty. Warranty shall warrant against ceiling tile sagging, warping and suspension grid rusting.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Acoustic Tiles/Panels:
  - 1. Armstrong World Industries, Inc: [www.armstrongceilings.com](http://www.armstrongceilings.com).
  - 2. CertainTeed Corporation: [www.certainteed.com](http://www.certainteed.com).
  - 3. Rockfon, LLC: [www.rockfon.com/#sle](http://www.rockfon.com/#sle).
  - 4. USG: [www.usg.com](http://www.usg.com).

- 5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Suspension Systems:
  - 1. Same as for acoustical units.
  - 2. Substitutions: See Section 01 6000 - Product Requirements.

## **2.02 ACOUSTICAL UNITS**

- A. Acoustical Tile Type L1 (L1-B) - Standard Panel: Painted mineral fiber, ASTM E 1264 Type III, Form 2, Sag Resistant Panels with the following characteristics:
  - 1. Size: 24 by 24 inches.
  - 2. Thickness: 5/8 inches.
  - 3. Composition: Water felted.
  - 4. Light Reflectance: Not less than 0.85 percent, determined in accordance with ASTM E1264.
  - 5. NRC Range: Not less than 0.55, determined in accordance with ASTM E1264.
  - 6. Ceiling Attenuation Class (CAC): Not less than 33, determined in accordance with ASTM E1264.
  - 7. Edge: Square.
  - 8. Surface Color: White typical. Black at L1-B.
  - 9. Surface Pattern: CE (perforated, small holes and lightly textured)..
  - 10. Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Provide acoustical tiles treated with manufacturer's standard antimicrobial formulation that inhibits fungus, mold and mildew.
  - 11. Products:
    - a. Basis of Design: Fine Fissured 1728 as manufactured by Armstrong World Industries
    - b. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed in paragraph 2.01.
    - c. Substitutions: See Section 01 6000 - Product Requirements.
- B. Acoustical Tile Type L3 - High Humidity Panel: Painted mineral fiber, ASTM E 1264 Type XX, Sag Resistant Panels with the following characteristics:
  - 1. Size: 24 by 24 inches.
  - 2. Thickness: 5/8 inches.
  - 3. Composition: Water felted.
  - 4. Light Reflectance: Not less than 0.82 percent, determined in accordance with ASTM E1264.
  - 5. NRC Range: Not less than 0.55, determined in accordance with ASTM E1264.
  - 6. Ceiling Attenuation Class (CAC): Not less than 38, determined in accordance with ASTM E1264.
  - 7. Edge: Square.
  - 8. Surface Color: White.
  - 9. Surface Pattern: CE (perforated, small holes and lightly textured)..
  - 10. Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Provide acoustical tiles treated with manufacturer's standard antimicrobial formulation that inhibits fungus, mold and mildew.
  - 11. Products:
    - a. Basis of Design: Ceramaguard 607 as manufactured by Armstrong World Industries
    - b. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed in paragraph 2.01.
    - c. Substitutions: See Section 01 6000 - Product Requirements.
- C. Acoustical Tile Type L4 - Foodservice Panel: Painted mineral fiber, ASTM E 1264 Type IX Form 2, Sag Resistant Panels with the following characteristics:
  - 1. Size: 24 by 24 inches.
  - 2. Thickness: 5/8 inches.
  - 3. Composition: Water felted.

4. Light Reflectance: Not less than 0.89 percent, determined in accordance with ASTM E1264.
  5. Ceiling Attenuation Class (CAC): Not less than 33, determined in accordance with ASTM E1264.
  6. Edge: Square.
  7. Surface Color: White.
  8. Surface Pattern: G (smooth texture).
  9. Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Provide acoustical tiles treated with manufacturer's standard antimicrobial formulation that inhibits fungus, mold and mildew.
  10. Products:
    - a. Basis of Design: Kitchen Zone 673 as manufactured by Armstrong World Industries
    - b. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed in paragraph 2.01.
      - 1) Vinyl faced, gypsum core products are acceptable.
    - c. Substitutions: See Section 01 6000 - Product Requirements.
- D. Glass Fiber Acoustical Panels Type L6 – Acoustical "Absorptive" Panel: painted faced glass fiber, ASTM E 1264 Type XII, Form 2, Sag Resistant Panels with the following characteristics:
1. Size: 24 by 24 inches.
  2. Thickness: 1-1/2 inches.
  3. Light Reflectance: Not less than 0.90 percent, determined in accordance with ASTM E1264.
  4. NRC Range: Not less than 1.00, determined as specified in ASTM E 1264.
  5. Articulation Class (AC): Not less than 200, determined in accordance with ASTM E1264.
  6. Edge: Square.
  7. Surface Color: White.
  8. Surface Pattern: E (fine texture).
  9. Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Provide acoustical tiles treated with manufacturer's standard antimicrobial formulation that inhibits fungus, mold and mildew.
  10. Products:
    - a. Basis of Design: Optima Lay-In 3159 as manufactured by Armstrong World Industries
    - b. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed in paragraph 2.01.
    - c. Substitutions: See Section 01 6000 - Product Requirements.

### **2.03 SUSPENSION SYSTEM(S)**

- A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.
- B. Exposed Steel Suspension System: Formed steel, commercial quality cold rolled; heavy-duty.
  1. Profile: Tee; 15/16 inch wide face, main tee 1-1/2 inch, cross tee 1-1/2 inch.
  2. Construction: Double web.
  3. Finish: White painted.
  4. Products:
    - a. Basis of Design for Non-Fire Rated Assemblies – Ceiling Types I, II, V, VI, VII and IX: "Prelude XL Galvanized Capped" as manufactured by Armstrong World Industries
    - b. Basis of Design for Non-Fire Rated Assemblies – Ceiling Types III, IV: "Prelude XL Aluminum Capped" as manufactured by Armstrong World Industries
    - c. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed in paragraph 2.01. Ceiling Tile and Grid shall be as approved by the manufacturer.
    - d. Substitutions: See Section 01 6000 - Product Requirements.



C. Open Grid System

1. Components: All main beams and cross tees shall be commercial-quality galvanized steel coating as per ASTM A 653. Exposed surfaces chemically cleansed, capping pre-finished galvanized steel. Main beams and cross tees are double-web steel construction and have a 15/16" type exposed flange design. Cross tees shall have staked-on end detail allowing for easy cross tee removal and remounting.
  - a. Structural Classification: ASTM C635 heavy duty.
  - b. Color: Custom match to paint colors. Reference Section 01 6210 - Schedule of Colors for approved color selections.
  - c. Prelude XL 360° Painted Grid, as manufactured by Armstrong.
2. Finish: All steel roll-formed parts shall be chemically cleansed hot dipped galvanized steel. Main beams and cross tees shall be painted 360° and prefinished in baked polyester paint.
3. Attachment Devices: Size for five times design load indicated in ASTM C635, Table 1, Direct Hung unless otherwise indicated.
4. Wire for Hanger and Ties: ASTM A 641, Class 1 zinc coating, soft temper, prestretched, with a yield stress load of at least three times design load, but not less than 12 gauge.
5. Edge Moldings and Trim: Armstrong Axiom Classic trim.
6. Products:
  - a. Basis of Design for Open Grid System: "Prelude XL 360° Painted Grid" as manufactured by Armstrong World Industries
  - b. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed in paragraph 2.01. Ceiling Tile and Grid shall be of the same manufacturer.
  - c. Substitutions: See Section 01 6000 - Product Requirements.

**2.04 ACCESSORIES**

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.
    1. Angle Hangers: ASTM A 446 steel with G90 coating.
    2. Flat Hangers: Zinc-coated steel.
    3. Hanger Rods: Zinc-coated steel.
  - B. Perimeter Moldings: Same material and finish as grid.
    1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.
  - C. Decorative Grid System Trim
    1. Physical properties.
      - a. Extruded aluminum alloy 6063 trim channel, 10' straight or curved profiles.
      - b. Concealed connections to grid with T-bar connection clip, including all necessary trim for corners inside and outside and all accessories.
      - c. Size: 6 inch" wide face with 3/4" horizontal legs, straight or curved sections with special bosses formed for attachment to Axiom T-bar connection clip or hanging clip.
      - d. Color: Match color of grid.
      - e. Finish: Factory-applied baked polyester paint.
    2. Products:
      - a. Basis of Design: Axiom, Classic Trim as manufactured by Armstrong World Industries.
      - b. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed in paragraph 2.01.
      - c. Substitutions: See Section 01 6000 - Product Requirements.
  - D. Acoustical Sealant For Perimeter Moldings: Non-hardening, non-skinning, for use in conjunction with suspended ceiling system.
-

- E. Touch-up Paint: Type and color to match acoustical and grid units.
- F. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers will not interfere with other work.

### **3.02 INSTALLATION - SUSPENSION SYSTEM**

- A. Install suspension system in accordance with UL design requirements ASTM C 636/C 636M, ASTM E 580/E 580M, and manufacturer's instructions and as supplemented in this section.
- B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- C. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.
- D. Main runners directly suspended by minimum 12 gage galvanized steel wire; hanger wire wrapped tightly a minimum three full turns.
  - 1. Runner Spacing: 4'-0".
  - 2. Hanger Spacing: 4'-0".
- E. Main runners interconnected by cross-tees to form modules as shown on reflected ceiling plans. Suitable cross-tee lengths adjacent to recessed light fixtures on each side not supported by a main runner.
  - 1. Cross-Tee Spacing: 4'-0".
- F. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
- G. Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.
- H. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- I. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- J. Do not eccentrically load system or induce rotation of runners.
- K. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
  - 1. Use longest practical lengths.
  - 2. Overlap and rivet corners.
- L. Add extra ceiling wire at each corner of light fixtures and grilles.
- M. Fire rated main runner/cross runner fire expansion relief cutout shall be evaluated for load performance where field application requires the expansion relief to be designed more than 3" from the closest support point.
- N. Form expansion joints as detailed. Form to accommodate plus or minus 1 inch movement. Maintain visual closure.

### **3.03 INSTALLATION - ACOUSTICAL UNITS**

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

- C. Install acoustical ceiling units from a three-carton mix to obtain uniform distribution of surface variations.
- D. Fit border trim neatly against abutting surfaces.
- E. Install units after above-ceiling work is complete.
- F. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- G. Cutting Acoustical Units:
  - 1. Cut to fit irregular grid and perimeter edge trim.
  - 2. Make field cut edges of same profile as factory edges.
- H. Sound walls: Set acoustical ceiling boards in four continuous beads of 1/4" diameter sealant, one at top of each edge of the gypsum drywall and two on top of the top metal runner track.
- I. Install hold-down clips on each panel to retain panels tight to grid system at rated assemblies; comply with fire rating requirements.

#### **3.04 ADJUSTMENTS**

- A. Make adjustments in ceiling system as necessary to ensure compliance with this specification.
- B. Remove and replace damaged or soiled acoustical ceiling units.

#### **3.05 CLEANING**

- A. Remove debris which may have been caused during installation of this work.
- B. In addition to other stipulated requirements for cleaning, completely remove fingerprints and traces of soil from the surfaces of grid and acoustical materials, using only those cleaning materials recommended for the purpose by the manufacturer of the material being cleaned.

**END OF SECTION**



**SECTION 09 5426  
SUSPENDED WOOD CEILINGS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Wood veneer panels.
- B. Metal suspension system.

**1.02 RELATED REQUIREMENTS**

**1.03 REFERENCE STANDARDS**

- A. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings 2022.
- B. Cisca (WC) - Wood Ceilings Technical Guidelines 2009.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Sequence work to ensure ceilings are not installed until building is enclosed, dust generating activities have terminated, and overhead work is completed.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate grid layout and related dimensioning, attachment of wood ceiling components to grid, accessory attachments, junctions with other ceiling finishes, and mechanical and electrical items installed in the ceiling.
- C. Product Data: Provide data on wood ceiling components and suspension system components.
- D. Samples: Submit two full size samples illustrating material and finish of wood ceiling components.
- E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- F. Manufacturer's Qualification Statement.
- G. Installer's Qualification Statement.

**1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section.
  - 1. Minimum three years documented experience.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver wood ceiling components to project site in original, unopened packages.
- B. Store in fully enclosed space, flat, level and off the floor.

**1.08 FIELD CONDITIONS**

- A. Do not install suspended wood ceiling system until wet construction work is complete and permanent heat and air conditioning is installed and operating.
- B. Maintain room temperature between 60 degrees F and 75 degrees F and relative humidity between 35 to 55 percent before, during, and after installation.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Suspended Wood Ceilings:
  - 1. ACGI/Armstrong World Industries, Inc: [www.armstrongceilings.com/#sle](http://www.armstrongceilings.com/#sle).
  - 2. Substitutions: See Section 01 6000 - Product Requirements.

## **2.02 SUSPENDED WOOD CEILING SYSTEM**

- A. Performance Requirements:
  - 1. Design for maximum deflection of 1/360 of span.
- B. Wood Veneer Panels: Composite wood core with wood veneer finish.
  - 1. Panel Size: 12 by 15 inches.
  - 2. Panel Thickness: 3/4 inch.
  - 3. Veneer Species: Walnut.
    - a. Veneer Cut: Plain sliced.
    - b. Veneer Matching: Book matched.
    - c. End Matching: Manufacturer's recommended matching.
    - d. Factory Finish: Clear sealer.
  - 4. Attachment to Suspension Grid: Lay-in.
  - 5. Edge Profile: Square.
- C. Metal Suspension System:
  - 1. General: Comply with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold down clips, stabilizer bars, clips, and splices as required.
  - 2. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement.
- D. Accessories: Manufacturer's standard accessories for installation method indicated, above-ceiling accessibility.

## **2.03 FABRICATION**

- A. Shop fabricate wood ceiling components to the greatest extent possible.
- B. Fabricate components to allow access to ceiling plenum as required.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Do not install ceiling until after interior wet work is dry.

### **3.02 PREPARATION**

- A. Coordinate the location of hangers with other work.
- B. Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.
- C. Layout wood ceiling components in pattern according to reflected ceiling plan and as shown on shop drawings.
- D. Acclimate wood ceiling materials by removing from packaging in installation area a minimum of 48 hours prior to installation.

### **3.03 INSTALLATION**

- A. General: Install suspended wood ceiling system in accordance with CISCA (WC).
- B. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
- C. Wood Ceiling:
  - 1. Install wood ceilings in accordance with manufacturer's instructions.
  - 2. Fit wood components in place, free from damaged edges or other defects detrimental to appearance and function.
  - 3. Install components in uniform plane, and free from twist, warp, and dents.
  - 4. Cut to fit irregular grid and perimeter edge trim.
  - 5. Make field cut edges of same profile as factory edges, seal and finish according to manufacturer.

6. Install clips, stabilizer bars, and other attachments as indicated to secure wood ceiling components tight to the grid system.

#### **3.04 TOLERANCES**

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

#### **3.05 CLEANING**

- A. Clean and touch up minor finish damage. Remove and replace components that cannot be successfully cleaned and repaired.

**END OF SECTION**





**SECTION 09 6429**  
**WOOD STRIP AND PLANK FLOORING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Wood strip flooring, nailed.
- B. Hardboard stage flooring
- C. Secondary subflooring.
- D. Sleepers.
- E. Sheet vapor retarder.
- F. Surface finishing.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete subfloor surface.
- B. Section 06 1000 - Rough Carpentry: Wood subfloor surface.
- C. Section 09 9000 - Painting and Coating: Surface finish to flooring.

**1.03 REFERENCE STANDARDS**

- A. NWFA (IG) - Installation Guidelines Current Edition.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for flooring.
- C. Shop Drawings: Indicate floor joint pattern and termination details.
- D. Samples: Submit two samples 12 by 12 inch in size illustrating floor finish, color, and sheen.
- E. Installation Instructions: Indicate standard and special installation procedures.
- F. Maintenance Data: Include maintenance procedures, recommended maintenance materials, a suggested schedule for cleaning, stripping and re-finishing recommendations, stain removal methods, and polishes and waxes.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.
  - 2. Deliver extra material to Owner. Before installation begins, furnish not less than 1.0 percent of the quantity of each type wood flooring installed on the Project, packaged with protective covering for storage and identified with labels clearly describing contents.

**1.05 QUALITY ASSURANCE**

- A. Perform work of this section in accordance with NWFA (IG).
  - 1. Maintain one copy of each document on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
- C. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.
- D. The flooring contractor shall be an MFMA Mill Accredited Installation Company and also a accredited installer of Robbins, Connor, or Aacer Flooring with MFMA accredited installer(s) on-site for the duration of the wood floor installation.

**1.06 FIELD CONDITIONS**

- A. Do not install wood flooring until wet construction work is complete and ambient air at installation space has moisture content stabilized at maximum moisture content of 40 percent.
- B. Provide heat, light, and ventilation prior to installation.

- C. Store materials in area of installation for minimum period of 24 hours prior to installation.
- D. Maintain minimum room temperature of 65 degrees F for a period of two days prior to delivery of materials to installation space, during installation, and after installation.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Hardwood Strip and Plank Flooring:
  - 1. Connor Sports Flooring: [www.connorfloor.com](http://www.connorfloor.com).
  - 2. Robbins Sports Surfaces: [www.robbinsfloor.com](http://www.robbinsfloor.com).
  - 3. Substitutions: Section 01 6000 - Product Requirements.

### **2.02 MATERIALS**

- A. Wood Strip Flooring:
  - 1. Species: Northern hard maple.
  - 2. Grade: Second and better.
  - 3. Cut: Flat grain.
  - 4. Moisture Content: 7 to 9 percent.
  - 5. Actual Thickness: 25/32 inch.
  - 6. Actual Width: 2-1/4 inches.
  - 7. Edge: Tongue and Groove.
  - 8. End: End matched.
  - 9. Length: Random, minimum of 9 inches.
- B. Hardboard Stage Floor. Tempered hardboard, 1/4 inch thick.
  - 1. Georgia-Pacific Wood Products LLC: [www.buildgp.com](http://www.buildgp.com).
  - 2. Masonite International Corp.: [www.masonite.com](http://www.masonite.com).
  - 3. Substitutions: Section 01 6000 - Product Requirements.
- C. Flooring Nails: Type recommended by flooring manufacturer.
- D. Sleepers and Shims: Softwood lumber, pressure treated for moisture protection, 2 by 3 inch size.
- E. Secondary Subflooring: 1 layer 3/4 inch thick plywood, with square edges; Exposure 1, unsanded.
  - 1. Provide 1 layer 3/4 inch and 1 layer 1/2 inch at hardboard floor.

### **2.03 ACCESSORIES**

- A. Ventilating Base: Molded rubber, 4 inch high with a 3 inch toe, ventilating type, with adhesives and accessories; color as selected.
- B. Wood Plugs: Round shape, 3/4 inch diameter by 1/8 inch thick, of same species as flooring.
- C. Floor Finish - Wood Floor:
  - 1. 1st-2nd Coat: Oil modified sealer
  - 2. 3rd-4th Coat: Oil modified finish
  - 3. After proper sanding, floor must be completely free from sanding dust and perfectly clean. Apply a seal. Allow to dry 2-4 hours under normal conditions (77 deg. F. and 50% RH) then scuff surface with #3 steel wool. Remove sanding dust and apply a second coat. Let dry 24 hours.
- D. Floor Finish - Hardboard Stage:
  - 1. Lightly sand hardboard floor finish and sweep clean.
  - 2. 1st Coat: SW Enamel Undercoater
  - 3. 2nd/3rd Coat: SW Pro-Mar 200 Latex Paint, Flat Black.

### **2.04 SOURCE QUALITY CONTROL**

- A. Inspect and stamp species and grade on underside of each piece of wood flooring at factory.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting this work.
- B. Verify that concrete subfloor surface is smooth and flat to plus or minus 1/4 inch in 10 feet.
- C. Verify wood subfloor is properly secured, smooth and flat to plus or minus 1/4 inch in 10 feet.
- D. Verify that required floor-mounted utilities are in correct location.

### **3.02 PREPARATION**

- A. Sleepers and Shims:
  - 1. Place vapor retarder over subfloor surface, lapping edges and ends minimum 6 inches and tape seal; spot glue in place.
  - 2. Place sleepers over vapor retarder; space sleepers at 8 inches on center.
  - 3. Shim underside of sleepers to achieve level line of plus or minus 1/4 inch in 10 feet.
  - 4. Anchor sleepers to concrete substrate with explosive driven concrete nails; place nails at 16 inches on center.
  - 5. Anchor sleepers to wood substrate with cement-coated nails; place nails at 16 inches on center.
- B. Secondary Subflooring: Place plywood subflooring over sleepers.
  - 1. Lay perpendicular to the sleepers, with end joints over sleepers, and nail at 12 inches on center.
- C. Prepare substrate to receive wood flooring in accordance with manufacturer's and NWFA instructions.
- D. Broom clean substrate.

### **3.03 INSTALLATION**

- A. Sheathing Paper: Place over wood subfloor; lap edges and ends 2 inches, staple in place.
- B. Wood Flooring:
  - 1. Install in accordance with manufacturer's and NWFA instructions; predrill and blind nail to subfloor.
  - 2. Lay flooring parallel to length of room areas. Verify alignment as work progresses.
  - 3. Arrange flooring with end matched grain set flush and tight.
  - 4. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar; provide divider strips and transition strips in accordance with flooring manufacturer's recommendations and as indicated.
  - 5. Install edge strips at unprotected or exposed edges, and where flooring terminates.
  - 6. Secure edge strips before installation of flooring with stainless steel screws.
  - 7. Install flooring tight to floor access covers.
  - 8. Provide 1-1/2 inch expansion space at fixed walls and other interruptions.
- C. Install base at floor perimeter to cover expansion space in accordance with manufacturer's instructions. Miter inside and outside corners.
- D. Finishing:
  - 1. Mask off adjacent surfaces before beginning sanding.
  - 2. Sand flooring to smooth even finish with no evidence of sander marks. Take precautions to contain dust. Remove dust by vacuum.
  - 3. Apply first coat, allow to dry, then buff lightly with steel wool to remove irregularities. Vacuum clean and wipe with damp cloth before applying succeeding coat.
  - 4. Lightly buff between coats with steel wool and vacuum clean before applying succeeding coat.
  - 5. Apply last coat of finish.

**3.04 CLEANING**

- A. Clean and polish floor surfaces in accordance with floor finish manufacturer's instructions.

**3.05 PROTECTION**

- A. Prohibit traffic on floor finish for 48 hours after installation.
- B. Place protective coverings over finished floors; do not remove coverings until Date of Substantial Completion.

**END OF SECTION**

**SECTION 09 6466**  
**WOOD ATHLETIC FLOORING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Wood Flooring for Gymnasiums
- B. Wood Flooring for Dance Studios

**1.02 RELATED REQUIREMENTS**

- A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 in these specifications.
- B. Section 03 3000 – Cast-In-Place Concrete
  - 1. Concrete substrate flatness and leveling tolerances, curing, finishing, and vapor barrier.
  - 2. Slab Depression: Verify depression with final approved product.
  - 3. Tolerance: 1/8" in radius of 10' Surface-steel troweled.
- C. Section 11 6623 – Gymnasium Equipment

**1.03 REFERENCE STANDARDS**

- A. MFMA - Maple Flooring Manufacturers Association
- B. DIN - Performance Standard DIN 18032, Part II

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product data: Provide manufacturer's detailed technical product data and installation instructions for each type of wood flooring. Include instructions for handling, storage, installation, dimensions of individual components, profiles, edge detail, finishing, protection, and maintenance.
- C. Samples: Submit sets of range samples for each type of wood flooring:
  - 1. Include finish samples of factory-finished flooring.
  - 2. Include samples of striping of different colors indicated.
  - 3. Accessories: Include minimum 6-inch-long samples of each type of required accessory item such as baseboard, and trim.
- D. Shop drawings: Indicate layout and types of wood flooring, including plans, elevations, sections, details of anchorage and attachments to other units of work, and conditions requiring feature strips, reducer strips, baseboard, trim, molding, nosings, or other accessories.
- E. Maintenance Literature
  - 1. Submit three (3) copies of "MFMA Care and Preservation of Your Wood Floors."
- F. Certification
  - 1. Suppliers shall submit an Otto Graph Institute suitability report attesting that floor system has passed all DIN requirements under DIN 18032, Part II.
  - 2. Suppliers shall submit certificates attesting that materials furnished will meet specifications for grade, quality, and dryness.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.
  - 2. Deliver extra material to Owner. Before installation begins, furnish not less than 1.0 percent of the quantity of each type wood flooring installed on the Project, packaged with protective covering for storage and identified with labels clearly describing contents.

**1.05 QUALITY ASSURANCE**

- A. Floor System Manufacturer Qualifications
  - 1. Manufacturer shall be an established firm experienced in field and have been in business for a minimum of ten years.

2. Manufacturer shall be a member in good standing of the Maple Flooring Manufacturers Association.
- B. Floor Contractor/Installer Qualifications
  1. Flooring Contractor/Installer shall be a firm experienced in flooring field and approved by manufacturer and have operated under the same corporate name for the last ten years.
  2. The flooring contractor shall be an MFMA Mill Accredited Installation Company and also a accredited installer with the flooring manufacturer with MFMA Accredited Installer(s) on-site for the duration of the wood floor installation.
  3. Flooring Contractor/Installer shall submit a list of at least ten completed jobs similar in size and specifications.
- C. Performance Qualifications
  1. Ten days prior to bid date a letter of compliance and a copy of the actual "Suitability Test Report" shall be provided by the manufacturer to the Architect to verify that the system meets and/or exceeds all of the DIN criteria set forth below. All testing must be done in accordance with DIN 18032, part II, area elastic gymnasium floor, Otto-Graf Institute, Stuttgart, Germany. Testing must be done by the Otto-Graf Institute or an independent testing laboratory complying with DIN 18032, Part II testing procedures. Also included in the letter of compliance is verification that maple lengths, (+/-6'6") will be as specified. Flooring system shall have been tested and passed the requirements of DIN 18032, Part II as set out below:
    - a. Shock Absorption: shall be 53% minimum.
    - b. Ball Return: shall be at least 90%.
    - c. Deflection: shall be 2.3mm minimum.
    - d. Area Deflection: (Isolation of impact) less than 15.0%
    - e. Friction: Pass (0.5 to 0.7)
    - f. Rolling Load: Pass (337.6 lbs min.)
  2. The manufacturer and installer will warranty the product jointly for a period of two years from the date of completion. An unsigned copy of the warranty must accompany the product samples before a contract for installation is issued.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Delivery of Materials
  1. Materials shall not be delivered, stored or installed until all masonry, painting, plastering, tilework, marble and terrazzo work are complete. All overhead mechanical work, lighting, backstops, scoreboards are installed prior to floor installation. Room temperature of at least 60 to 80 degrees Fahrenheit and relative humidity of 35 to 50% are to be maintained. Ideal installation/storage conditions are the same as those which will prevail when building is occupied.

#### **1.07 FIELD CONDITIONS**

- A. Do not install floor system until concrete has been cured 60 days and the requirements are obtained.
- B. Permanent heat, light and ventilation shall be installed and operating before, during and after installation. Maintaining a temperature range of 60 to 80 degrees Fahrenheit and a relative humidity range of 35 to 50%.
- C. After floors are finished, area to be kept locked by General Contractor to allow curing time for the finish. If after required curing time, General Contractor or Owner requires use of the gym, he shall protect the floor by covering with non-fibred kraft paper or red rosin paper with taped joints, until acceptance by Architect of complete wood floor.

## **1.08 WARRANTY**

- A. Guarantee shall not cover damage caused in whole or in part by casualty, ordinary wear and tear, abuse, use for which material is not designed, faulty construction of the building, settlement of the building walls, failure of other contractors to adhere to specifications, separation of the concrete slab and excessive dryness or excessive moisture from humidity, spillage, migration through the slab or wall, or any other source.
- B. The manufacturer shall hereby warrant the material to be free from manufacturing defects for a period of one (1) year. This warranty is in lieu of all other warranties, expressed or implied, including but not limited to any warranty of merchantability or fitness for a particular purpose, and of any other obligation on the part of the manufacturer. In the event of breach of any warranty, the liability of the manufacturer shall be limited to repairing or replacing the material and system components supplied by the manufacturer and proven to be defective in manufacture, and shall not include any other damages, either direct or consequential.
- C. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Connor Sports Flooring: [www.connorfloor.com](http://www.connorfloor.com).
- B. Robbins Sports Surfaces: [www.robbinsfloor.com](http://www.robbinsfloor.com).
- C. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 MATERIALS – GYMNASIUMS**

- A. Membrane
  - 1. 6 mil polyethylene
- B. Hardwood Flooring System equal to "ACS" Air-Channel Star System by Robbins, Anchored Rezill Sleeper (DIN) by Connor or Anchored Power Sleeper DIN by Aacer.
  - 1. Robbins 7/16" Bio-Cushion Pads
    - a. Pads shall be double trapezoidal EPDM rubber with reverse cavity. Lower and upper surfaces shall be non-coextensive. Pads shall have full & immediate recovery.
  - 2. "ACS" sleepers having eight (8) 7/16" Bio-Pads properly spaced and stapled to the bottom and modified to accept anchors.
  - 3. Robbins "Posi-Anchor" anchoring pin.
  - 4. Plywood Sub-floor - 15/32" APA Rated Sheathing Exposure I.
  - 5. Fasteners
    - a. Sub-flooring - 1-1/4" coated nails or staples.
    - b. Flooring - 2" barbed cleat or equivalent.
  - 6. Flooring
    - a. 25/32" x 2-1/4" 2nd & Btr Grade Northern Hard Maple flooring, R/L, KD, TG, & EM MFMA grade marked and stamped as manufactured by Robbins, Connor or Aacer Flooring in accordance with the MFMA grading rules and standards. Court shall be 2nd & Btr Grade. Remainder of floor shall be 3rd Grade.

### **2.03 MATERIALS – DANCE STUDIO**

- A. Membrane 6-mil polyethylene.
- B. 3/4" Bio-Pads shall be EPDM Rubber with a durometer of 50, Connor 3/4" Black Neo-shok, and Aacer 3/4" Blue Tri-Power Pad.
- C. Plywood underlayment – 2 layers 1/2" (15/32") x 48" x 96" APA Rated Sheathing, Exposure 1, minimum 4 ply, Fir or Southern Pine.
- D. Nails – 1" coated staples or equivalent for sub-floor, 2" barbed cleat for flooring.
- E. Adhesives:
  - 1. Construction adhesive - PL400 or equal to glue plywood sheets together.

- F. Flooring: 25/32 " x 2-1/4" 2nd & Btr Grade Northern Hard Maple flooring, R/L, KD, TG, & EM MFMA grade marked and stamped as manufactured by Robbins, Connor, or Aacer Flooring in accordance with the MFMA grading rules and standards.

## **2.04 FINISHING**

- A. Materials:
  - 1. 1st/2nd Coat: Hillyard's Trophy Seal
  - 2. Court Striping: Hillyard's Gym Marking Paint
  - 3. 3rd/4th Coat: Hillyard's Trophy Seal
- B. Game line paint shall be as recommended by the finishing materials manufacturer, compatible with the finish system.
- C. After proper sanding, floors must be completely free from sanding dust and perfectly clean. Apply one liberal coat tack sealer. Screen or steel wool and vacuum and/or tack between each coat after it dries. Clean floor. For gym floors, mark game lines in accordance with drawings and UIL Standards. Let dry 24 hours. For dance studios, after applying sealer, buff in order to provide a low gloss, flat finish.
- D. Painted Graphics:
  - 1. All painted graphics shown on the drawings shall be included in the base proposal and shall be included in this section.
  - 2. Contractor shall note that school colors and mascot may be released after initial color selection. Contractor shall make all necessary adjustments.

## **2.05 OTHER MATERIALS**

- A. Perimeter Base Molding – 3" x 4" rubber ventilating type. Provide factory preformed exterior corners and job mitered interior corners.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Inspect concrete sub-floors for proper tolerance and dryness, and report any discrepancies to the general contractor.
- B. All work required to put the concrete sub-floors in acceptable condition shall be the responsibility of the general contractor.
- C. Sub-floor should be broom cleaned by general contractor.

### **3.02 INSTALLATION**

- A. Hardwood Flooring System – Gymnasium
  - 1. Install polyethylene with joints lapped a minimum of 6".
  - 2. Install ACS-Sleepers end to end at right angles to finished flooring spaced 16" O.C.
  - 3. Properly anchor ACS-Sleepers using Robbins Posi-Anchors. Maintain a 2" minimum expansion void at all walls and other permanent obstructions.
  - 4. Install plywood sub-floor with long dimension perpendicular to finish flooring staggering joints 24" in adjacent rows and spacing 1/4". Securely nail plywood sub-floor to ACS-Sleepers.
  - 5. Machine nail maple finish flooring at right angles to ACS-Sleepers and provide proper spacing for humidity conditions in the specific regions. Provide 2" expansion void at the perimeter.
- B. Robbins Bio Cushion Classic – Dance Studio
  - 1. Install polyethylene film with joints lapped a minimum of 6".
  - 2. Install Robbins resilient Bio-Pads to bottom of first layer of sub-floor, 32 pads per panel or 12" on centers. Panels shall be laid perpendicular to finish flooring. (Optional laid at 45 degree angle). Allow 1/4" spacing on all sides of abutted panels and stagger joints 4'.



3. Install second layer of plywood laid diagonally at 45 degree angles over the first layer with 1/4" spacing on all edges and breaking rows at 4'. Second layer shall be attached by applying ribbons of adhesive in a box - X pattern and using 1" - 1-1/4" coated nails or staples at a minimum of 12" on center. If laying first layers at 45 degree angle, lay second layer at opposite 45 degree angle. Provide a 1-1/2-2" expansion voids at perimeter and all vertical obstructions.
  4. Machine nail maple finish flooring at right angles to ACS-Sleepers and provide proper spacing for humidity conditions in the specific regions. Provide 2" expansion void at the perimeter.
- C. Sanding
1. Sand flooring with drum sander, edger, buffer, and hand scraper.
  2. Use coarse, medium and fine grade sandpaper.
    - a. After sanding with drum sander, buff entire floor using 100 grit screenback or equal grit sandpaper, with a heavy-duty buffing machine.
    - b. Vacuum or tack floor before first coat of finish.
    - c. Floor shall present a smooth surface without drum stop marks, gouges, streaks or shiners.
- D. Finishing
1. Apply two (2) coats of approved seal and two (2) coats of approved finish per manufacture's instructions.
  2. Buff and clean floor between coats.
  3. Games Lines: Apply game lines as indicated on drawings, between seal and first coat of finish.
- E. Perimeter Base Molding
1. Install vent cove base anchored to walls with base cement or screws and anchors. Use pre-molded outside corners and neatly mitered inside corners.
- F. Clean up all unused materials and debris and remove same from the premises.

### **3.03 CLOSEOUT ACTIVITIES**

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.
- B. Submit Material Safety Data Sheets under provisions of Section 01 7800 – Closeout Submittals for the following items:
  1. All mastics, glues, and adhesives
- C. See Section 01 7900 - Demonstration and Training, for additional requirements.
- D. Demonstration: Demonstrate maintenance of flooring to Owner's personnel.
  1. Instruction and maintenance shall be performed by the flooring subcontractor and a representative of the flooring manufacturer. Refer to Section 01 7800, Closeout Documents for additional requirements and information.
  2. The demonstration shall include written guidelines for the proper equipment, operation, materials and manufacturers recommended schedule of maintenance.

### **END OF SECTION**



**SECTION 09 6500  
RESILIENT FLOORING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Resilient tile flooring including layered vinyl tile.
- B. Resilient base.
- C. Installation accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.

**1.03 REFERENCE STANDARDS**

- A. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source 2019a, with Editorial Revision (2020).
- B. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring 2022.
- C. ASTM F1700 - Standard Specification for Solid Vinyl Floor Tile 2020.
- D. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source 2023.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Verification Samples: Submit two samples, 12 by 12 inch in size illustrating color and pattern for each resilient flooring product specified.
- D. Concrete Testing Standard: Submit a copy of ASTM F710.
- E. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of sub-floor is acceptable.
- F. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.
  - 2. All attic stock to be placed on pallets, shrink-wrapped, and clearly marked with campus. Attic stock to be delivered to TISD Warehouse, with transmittal, and verified with Owner upon delivery. Owner-signed transmittal to be included in close-out documents.
  - 3. Extra Flooring Material: 2% of each type and color.
  - 4. Extra Wall Base: 2% of each type and color.
  - 5. Extra Stair Materials: Quantity equivalent to 2% of each type and color.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum three years experience.
- B. Installer Qualifications: Company specializing in installing specified flooring with minimum three years experience.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.

- B. Store all materials off of the floor in an acclimatized, weather-tight space.
- C. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
- D. Do not double stack pallets.

#### **1.07 FIELD CONDITIONS**

- A. Maintain temperature in storage area between 65 degrees F and 85 degrees F.
- B. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 65 degrees F.

#### **1.08 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Submit a written warranty, executed by the Contractor, Installer, and Manufacturer, agreeing to repair or replace flooring that fails in materials or workmanship within the specified warranty period.
  - 1. Warranty Period: One (1) year after date of Substantial Completion.

### **PART 2 PRODUCTS**

#### **2.01 TILE FLOORING**

- A. Vinyl Tile (LVT): Printed film type, with transparent or translucent wear layer.
  - 1. Manufacturers:
    - a. Mannington Mills, Inc: [www.mannington.com](http://www.mannington.com).
    - b. Substitutions: See Section 01 6000 - Product Requirements.
  - 2. Minimum Requirements: Comply with ASTM F1700, of Class corresponding to type specified.
  - 3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or ASTM E 648.
  - 4. Tile Size: As scheduled.
  - 5. Wear Layer Thickness: 0.030 inch. (30 mil.)
  - 6. Total Thickness: 0.125 inch.
  - 7. Product/Color/Pattern: Refer to Section 01 6210 Schedule of Materials and Colors.

#### **2.02 RESILIENT BASE**

- A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove.
  - 1. Manufacturers:
    - a. Burke Flooring: [www.burkeflooring.com](http://www.burkeflooring.com).
    - b. Flexco, Inc: [www.flexcofloors.com](http://www.flexcofloors.com).
    - c. Johnsonite, a Tarkett Company: [www.johnsonite.com](http://www.johnsonite.com).
    - d. Roppe Corp: [www.roppe.com](http://www.roppe.com).
    - e. Substitutions: See Section 01 6000 - Product Requirements.
  - 2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or ASTM E 648.
  - 3. Height: 4 inch.
  - 4. Thickness: 0.125 inch.
  - 5. Length: Roll.
  - 6. Color: Refer to Section 01 6210 Schedule of Materials and Colors.
  - 7. Accessories: Premolded external corners where return is 3" or less.

#### **2.03 ACCESSORIES**

- A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
- B. Adhesives
  - 1. Provide only high moisture and alkali tolerant type adhesive as recommended by the manufacturer of the material being installed.

2. Asphalt emulsions and other non-waterproof adhesives will not be acceptable.
3. Contact manufacturer for recommended adhesive if pH levels exceed 9 or MVER exceeds 5 pounds.
- C. Where the moisture-vapor-emission rate exceeds the manufacturers allowable rate provide and install a moisture mitigating primer as recommended by the manufacturer.
- D. Moldings, Transition and Edge Strips: Vinyl products by same manufacturer as Resilient Base.
  1. Product: Profile equal to "Tile-Carpet Joiner #150" manufactured by Burke Flooring.
- E. Sealer and Wax: Types recommended by flooring manufacturer.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.
- C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for resilient flooring installation by testing for moisture and pH.
  1. Test in accordance with ASTM F710.
- D. Verify that required floor-mounted utilities are in correct location.

#### **3.02 PREPARATION**

- A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- B. Clean substrate.
- C. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

#### **3.03 INSTALLATION - GENERAL**

- A. Install in accordance with manufacturer's written instructions.

#### **3.04 INSTALLATION - TILE FLOORING**

- A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.
- B. Lay flooring with joints and seams parallel to building lines to produce symmetrical pattern.
- C. Install tile to pattern as indicated. Allow minimum 1/2 full size tile width at room or area perimeter.

#### **3.05 INSTALLATION - RESILIENT BASE**

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. Miter internal corners. At external corners, use premolded units. At returns of 3" or less, use premolded units.
- C. Install base on solid backing. Bond tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.
- E. Provide continuous sealant at top of base in all Foodservice areas including kitchens, food storage, serving lines, etc. Color as selected by Architect.

#### **3.06 CLEANING**

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean, seal, and wax in accordance with manufacturer's written instructions.
  1. LVT: Initial Maintenance and Preparation for Commercial Traffic

- a. Sweep, dust mop or vacuum the floor thoroughly to remove all loose dust, dirt, grit and debris.
- b. Remove any dried adhesive residue with a clean, white cloth dampened with mineral spirits, carefully following warnings on the container.
- c. Damp mop the floor with a properly diluted neutral (pH 6 to 8) detergent solution such as Armstrong S-485 Commercial Floor Cleaner.
- d. If necessary, scrub the floor using a rotary machine or auto scrubber with a properly diluted neutral detergent solution such as Armstrong S-485 Commercial Floor Cleaner and the appropriate scrubbing brush (aggressiveness equivalent to 3M red pad for light scrub, 3M blue pad or equal for a deep scrub).
- e. Thoroughly rinse the entire floor with fresh, clean water. Remove rinse water and allow the floor to dry completely.

### **3.07 PROTECTION**

- A. Prohibit traffic on resilient flooring for 48 hours after installation.
- B. Protect installed flooring as recommended by the flooring manufacturer against damage from rolling loads, other trades, or the placement of fixtures and furnishings.
- C. If it becomes necessary to move any heavy fixtures or appliances over the flooring on casters or dollies, the flooring should be protected with 1/4" or thicker plywood, hardboard or other underlayment panels. If other on-site work is continuing, use a protective covering such as plain, undyed kraft paper to guard against damage to the new floor.

#### **END OF SECTION**

**SECTION 09 6613  
PORTLAND CEMENT TERRAZZO FLOORING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Cast-in-place terrazzo floor and base.
- B. Divider strips and termination edging.
- C. Precast portland cement terrazzo units.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete subfloor with wood float finish.
- B. Section 07 9005 - Joint Sealers: Sealing joints between terrazzo work and adjacent construction and fixtures.

**1.03 REFERENCE STANDARDS**

- A. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar 2019.
- B. ASTM C33/C33M - Standard Specification for Concrete Aggregates 2023.
- C. ASTM C150/C150M - Standard Specification for Portland Cement 2022.
- D. NTMA (SPECS) - NTMA Terrazzo Specifications Current Edition.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for divider strips and sealer; include printed copy of current NTMA recommendations for the type of terrazzo involved.
- C. Shop Drawings: Indicate divider strip layout and details of adjacent components.
- D. Samples: Submit two samples, 6 x 6 inch in size illustrating color, chip size and variation, chip gradation, mortar color, and typical divider strip.
- E. Cleaning and Maintenance Data: Include procedures for stain removal, stripping, and sealing.

**1.05 QUALITY ASSURANCE**

- A. Perform work in accordance with NTMA recommendations as posted on their web site at [www.ntma.com](http://www.ntma.com).
- B. Manufacturer's Qualifications:
  - 1. Obtain primary Terrazzo Flooring System materials including membranes, primers, resins and hardening agents from a single manufacturer with documented experience providing terrazzo flooring, and proof of NTMA membership.
  - 2. Provide aggregates, solvents and other secondary materials from source recommended by manufacturer of primary materials.
- C. Installer Qualifications: Company specializing in performing the work of this section with not fewer than five years of documented experience.
- D. After approval of materials but prior to installation of terrazzo, Prime Contractor shall convene a Pre-Installation Conference at project site to review installation procedures, joint details, job site conditions, substrate specification, vapor barrier details, and coordination with other trades. Conference shall include but not be limited to Primer Contractor, Terrazzo Contractor, Design Professional, and any trade requiring coordination with work.

- E. It is the responsibility of this Sub-Contractor to test the concrete substrate for moisture content and levelness, prior to commencing installation of the flooring materials. This Sub-Contractor shall provide the General Contractor / Construction Manager and the Architect a letter stating that the concrete substrate has been spot checked for moisture content, levelness, and that the concrete substrate is or is not acceptable and within industry standards for the installation of this flooring material. To be included with this letter is a description of the floor layout of the areas where the spot checks were performed.

#### **1.06 MOCK-UP**

- A. Construct mock-up of terrazzo flooring illustrating appearance of finished work at corner. Size mock-up to be not less than 4 by 4 feet.
- B. Locate mock-up where directed.
- C. Accepted mock-up may remain as part of the Work.

#### **1.07 FIELD CONDITIONS**

- A. Do not install terrazzo when temperature is below 50 degrees F or above 90 degrees F.
- B. Maintain temperature within specified range 24 hours before, during, and 72 hours after installation of terrazzo.
- C. Provide ambient lighting level of 50 ft candles, measured at floor surface.

### **PART 2 PRODUCTS**

#### **2.01 PORTLAND CEMENT TERRAZZO APPLICATIONS**

- A. Floors: Sand Cushion Terrazzo.
  - 1. Aggregate Type: Marble chips.
- B. Wall Base: Precast portland cement terrazzo.
  - 1. Aggregate Type and Size: Same as floors.
- C. Stairs - Treads and Risers: Precast portland cement terrazzo.
  - 1. Aggregate Type and Size: Same as floors.

#### **2.02 PORTLAND CEMENT TERRAZZO FLOORING**

- A. Materials:
  - 1. Portland Cement: ASTM C150/C150M, Type I Normal; white color for topping mix; modified to NTMA higher compressive strength requirements; obtained from single source.
  - 2. Underbed: One part Portland cement to 4 parts sand by volume. Add water to produce low slump mix.
  - 3. Color Pigments For Topping: Non-fading mineral type, alkali-resistant.
  - 4. Terrazzo Sand: ASTM C33/C33M fine aggregates.
  - 5. Water: Potable.
  - 6. Surface Aggregate: Marble, free of deleterious or foreign matter.
- B. Accessories:
  - 1. Divider Strips: 1/8 inch thick zinc exposed top strip, zinc coated steel concealed bottom strip, with anchoring features.
  - 2. Divider and Control Joint Strip Height: To suit thickness of terrazzo topping, with allowance for grinding.
  - 3. Cleaner: Neutralizing liquid type, pH of 7 to 10.
  - 4. Sealer: Colorless, non-yellowing, penetrating liquid type, pH of 7 to 10; not detrimental to terrazzo components.

#### **2.03 PRECAST PORTLAND CEMENT TERRAZZO UNITS**

- A. Precast Portland Cement Terrazzo Units: Portland cement matrix, ASTM C150/C150M; cleaned and graded aggregate sized in accordance with NTMA gradation standards.
  - 1. Fabricate to sizes and profiles shown on drawings.



2. Setting Material: Latex Portland cement mortar, ANSI A118.4.
3. Anchors and Reinforcement for Precast Units: As recommended by manufacturer for type of installation.

#### **2.04 MATERIALS**

- A. Portland Cement: ASTM C150/C150M, Type I Normal; white color for topping mix; gray color for underbed; modified to NTMA higher compressive strength requirements; obtained from single source.
- B. Color Pigments For Topping: Non-fading mineral type, alkali-resistant.
- C. Water: Potable.

#### **2.05 ACCESSORIES**

- A. Divider Strips: 1/8 inch thick zinc exposed top strip, zinc coated steel concealed bottom strip, with anchoring features.
- B. Control Joint Strips: 1/8 inch nominal width zinc exposed top strips, zinc coated steel concealed bottom strip, 1/8 inch wide neoprene filler strip between vertical strips, with anchoring features.
- C. Divider and Control Joint Strip Height: To suit thickness of terrazzo topping, with allowance for grinding.
- D. Base Cap: Match divider strips.
- E. Slip Sheet: Asphalt treated and reinforced paper.
- F. Cleaner: Neutralizing liquid type, pH of 7 to 10.
- G. Sealer: Colorless, non-yellowing, penetrating liquid type, pH of 7 to 10; not detrimental to terrazzo components.

#### **2.06 MIXES**

- A. Refer to Schedule of Materials and Colors for approved color selection.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that substrate surfaces are ready to receive work.

#### **3.02 PREPARATION**

- A. Clean substrate of foreign matter.

#### **3.03 APPLICATION - MONOLITHIC TERRAZZO**

- A. Saw cut existing floor slab to receive divider and control joint strips and inserts and fill with grout.
- B. Install strips straight and level.
- C. Slope strips to match floor surface slope to drains.
- D. Install base divider strips to match floor pattern.
- E. Install terminating cap strip at top of base; attach securely to wall substrate.
- F. Place terrazzo topping mix over slurry coated substrate to a nominal thickness of 1/2 inch.

#### **3.04 APPLICATION - SAND CUSHION TERRAZZO**

- A. Place sand cover over structural floor substrate to a nominal thickness of 1/8 inch, and roll smooth.
- B. Place slip sheet over sand bed surface, lapping edges and ends 2 inches.
- C. Place cementitious underbed over slip sheet to nominal thickness of 1-3/4 inches. Broom finish top surface.

- D. Place divider strips and control joints at locations indicated and insert in semi-plastic uncured underbed. Install straight and level.

### **3.05 APPLICATION - BASE**

### **3.06 CURING**

- A. Begin curing procedures as soon as curing materials can be applied without damaging formed surfaces.
- B. Use curing method in accordance with NTMA instructions.
- C. Close area to construction traffic, allowing undisturbed curing.

### **3.07 INSTALLATION - PRECAST PORTLAND CEMENT TERRAZZO UNITS**

- A. Anchor precast units as shown on drawings.
- B. Install precast units using specified setting material.

### **3.08 SURFACE FINISHING**

- A. Brush apply terrazzo topping mix slurry to topping surface.
- B. Finish terrazzo in accordance with NTMA instructions.
- C. Grind terrazzo surface with power disc machine; successively sequence using coarse to fine grit abrasive, using a wet method.
- D. Apply grout mix matching matrix color to fill honeycomb exposed during grinding.
- E. After grout has sufficiently cured, grind repaired areas using a fine grit abrasive.

### **3.09 TOLERANCES**

- A. Maximum Variation from Flat Surface: 1/8 inch in 10 feet.
- B. Maximum Variation from Level (Except Surfaces Sloping to Drain): 1/8 inch.

### **3.10 CLEANING**

- A. Scrub and clean terrazzo surfaces with cleaner in accordance with NTMA instructions. Let dry.
- B. Immediately after terrazzo has dried, apply sealer in accordance with NTMA and manufacturer's instructions and let dry.
- C. Seal and polish surfaces in accordance with NTMA instructions.

### **3.11 PROTECTION**

- A. Do not permit construction traffic over finished terrazzo surfaces.

**END OF SECTION**

**SECTION 09 6723  
RESINOUS FLOORING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Resinous Flooring System
- B. Accessory Materials

**1.02 RELATED REQUIREMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.03 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-installation Conference:
  - 1. General contractor shall arrange a meeting not less than thirty days prior to starting work.
  - 2. Attendance:
    - a. General Contractor
    - b. Architect/Owner's Representative.
    - c. Manufacturer/Installer's Representative.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: For each type of product indicated. Include manufacturer's technical data, application instructions, and recommendations for each resinous flooring component required.
- C. Samples for Verification: For each resinous flooring system required, 6 inches square, applied to a rigid backing by Installer for this Project.
- D. Product Schedule: Use resinous flooring designations indicated in Part 2 and room designations indicated on Drawings in product schedule.
- E. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.
- F. Maintenance Data: For resinous flooring to include in maintenance manuals.

**1.05 QUALITY ASSURANCE**

- A. No request for substitution shall be considered that would change the generic resin type or minimum thickness of floor system specified. Equivalent materials of other manufacturers may be substituted only on approval of Architect or Engineer. Request for substitution will be considered only if submitted 10 days prior to bid date. Request will be subject to specification requirements described in this section.
- B. Installer Qualifications: Engage an experienced installer (applicator) who is experienced in applying resinous flooring systems similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance, and who is acceptable to resinous flooring manufacturer.
  - 1. Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.
  - 2. Contractor shall have completed at least 10 projects of similar size and complexity.
- C. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, through one source from a single manufacturer, with not less than ten years of successful experience in manufacturing and installing principal materials described in this section. Provide secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from source recommended by manufacturer of primary materials.

- D. Manufacturer Field Technical Service Representatives: Resinous flooring manufacture shall retain the services of Field Technical Service Representatives who are trained specifically on installing the system to be used on the project.
  - 1. Field Technical Services Representatives shall be employed by the system manufacturer to assist in the quality assurance and quality control process of the installation and shall be available to perform field problem solving issues with the installer.

#### **1.06 MOCK-UP**

- A. Apply mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
- B. Apply full-thickness mockups on 48-inch- square floor area selected by Architect.
  - 1. Include 48-inch length of integral cove base.
  - 2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.
- B. Store materials to prevent deterioration from moisture, heat, cold, direct sunlight, or other detrimental effects.
- C. All materials used shall be factory pre-weighed and pre-packaged in single, easy to manage batches to eliminate on site mixing errors. No on site weighing or volumetric measurements allowed.

#### **1.08 FIELD CONDITIONS**

- A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring application.
  - 1. Maintain material and substrate temperature between 65 and 85 deg F during resinous flooring application and for not less than 24 hours after application.
- B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring application.
- C. Close spaces to traffic during resinous flooring application and for not less than 24 hours after application, unless manufacturer recommends a longer period.
- D. Concrete substrate shall be properly cured for a minimum of 30 days. A vapor barrier must be present for concrete subfloors on or below grade. Otherwise, an osmotic pressure resistant grout must be installed prior to the resinous flooring

#### **1.09 WARRANTY**

- A. See Section 01 7700 - Closeout Procedures, for additional warranty requirements.
- B. Contractor shall provide a One Year "Joint and Separate Warranty" to the building owner signed by both the Manufacturer and the Contractor.
- C. Manufacturer shall warrant that materials shipped to buyers at the time of shipment are substantially free from material defects and will perform substantially to published literature if used in accordance with the latest prescribed procedures and prior to the expiration date.
- D. Contractor shall guarantee the installation and workmanship to be free of defects for a period of one year from the date of Substantial Completion.

- E. When a moisture suppression primer is used, manufacturer shall warrant that the moisture mitigating primer will, for a continuous period of two (2) years, reduce water vapor transmission levels to 3#/1000SF/24Hrs or less. This limited warranty shall warrant against failure caused by concrete water vapor pressure only of 20#/1000SF/24Hrs. or less. Warranty shall provide for reasonable labor and materials costs to repair affect areas only.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Stonhard: [www.stonhard.com](http://www.stonhard.com).
- B. Dur-A-Flex: [www.dur-a-flex.com](http://www.dur-a-flex.com).
- C. General Polymers: [www.generalpolymers.com](http://www.generalpolymers.com).
- D. Palma, Inc.: [www.palmainc.com](http://www.palmainc.com).
- E. Sika Corporation: [www.sikafloorusa.com](http://www.sikafloorusa.com).
- F. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 RESINOUS FLOORING**

- A. Products: Basis of Design - Stonhard - Stonshield HRI
  - 1. Subject to compliance with requirements of the following:
    - a. Nominal 3/16" thick and includes a penetrating two-component epoxy primer, three-component mortar consisting of epoxy resin, curing agent and finely graded quartz silica aggregate, three-component, epoxy undercoat, brightly colored, quartz silica aggregate broadcast and a high performance, two-component, clear epoxy sealer.
  - 2. System Characteristics:
    - a. Color and Pattern: To be selected from manufacturers full line
    - b. Wearing Surface: Standard or medium texture as selected from manufacturer.
    - c. Integral Cove Base: Refer to detail drawings.
    - d. Overall System Thickness: 3/16 inch (5 mm).
  - 3. System Components: Manufacturer's standard components that are compatible with each other and as follows:
    - a. Body Coat(s):
      - 1) Material Basis: HRI Mortar Base
      - 2) Resin: Epoxy
    - b. Sealer:
      - 1) Material Basis: Stonshield Sealer.
      - 2) Resin: Epoxy
      - 3) Formulation Description: 2 component, 100% solids.

### **2.03 ACCESSORY MATERIALS**

- A. Primer: Type recommended by manufacturer for substrate and body coats indicated.
  - 1. Where the moisture-vapor-emission rate exceeds the manufacturers allowable rate provide and install a moisture mitigating primer as recommended by the manufacturer.
- B. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.
  - 1. At feathered locations, provide underlayment equal to Armstrong S-194 Patch, "Underlayment, and Embossing Leveler"; or S-183 "Fast Setting Cement Based Patch and Skim Coat". Contractor shall verify manufacturer's product requirements for each finish material.
  - 2. Provide at all locations where floor finishes of differing thickness occur. Reference plans for typical detail.
- C. Provide metal termination strips at top of cove base and at centerline of doors.

- D. Joint Sealant: Type recommended or produced by resinous flooring manufacturer for type of service and joint condition indicated. Allowances should be included for flexible joint fill material.
- E. Provide crack isolation compound as recommended by manufacturer to mitigate cracks in existing foundation.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. General: Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry, and neutral Ph substrate for resinous flooring application.
- B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.
  - 1. Mechanically prepare substrates as follows:
    - a. Mechanically prepare with the use of Diamond grinding equipment to provide surface sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring. Or,
    - b. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
    - c. Comply with ASTM C 811 requirements, unless manufacturer's written instructions are more stringent.
  - 2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written recommendations.
  - 3. Verify that concrete substrates meet the following moisture requirements:
    - a. Perform in situ probe test, ASTM F 2170. Proceed with application only after substrates do not exceed a maximum potential equilibrium relative humidity of 92 percent.
    - b. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with application only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. of slab in 24 hours or as recommended by the manufacturer.
    - c. Perform additional moisture tests recommended by manufacturer. Proceed with application only after substrates pass testing or provide a moisture mitigating primer as recommended by the manufacturer.
  - 4. Verify that concrete substrates have neutral Ph and that resinous flooring will adhere to them. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.
- C. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.
- D. Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.
- E. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written recommendations. Allowances should be included for flexible joint fill material.

### **3.02 APPLICATION**

- A. General: Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.
  - 1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
  - 2. Cure resinous flooring components according to manufacturer's written instructions.
    - a. Prevent contamination during application and curing processes.

3. At substrate expansion and isolation joints, provide joint in resinous flooring to comply with resinous flooring manufacturer's written recommendations.
  - a. Apply joint sealant to comply with manufacturer's written recommendations.
- B. Mix and apply primer over properly prepared substrate with strict adherence to manufacturer's installation procedures and coverage rates
- C. Body coat: Mix base material according to manufacturer's recommended procedures. Uniformly spread mixed material over previously primed substrate using manufacturer's installation tool.
- D. First Sealer: Mix and apply topcoat with strict adherence to manufacturer's installation procedures.

### **3.03 TERMINATIONS**

- A. Chase edges to "lock" the coating system into the concrete substrate along lines of termination. Penetration Treatment: Lap and seal coating onto the perimeter of the penetrating item by bridging over compatible elastomer at the interface to compensate for possible movement.
- B. Trenches: Continue coating system into trenches to maintain monolithic protection. Treat cold joints to assure bridging of potential cracks.
- C. Treat floor drains by chasing the coating to lock in place at point of termination.

### **3.04 JOINTS AND CRACKS**

- A. Treat control joints to bridge potential cracks and to maintain monolithic protection.
- B. Treat cold joints and construction joints to bridge potential cracks and to maintain monolithic protection on horizontal and vertical surfaces as well as horizontal and vertical interfaces.
- C. Discontinue floor coating system at vertical and horizontal contraction and expansion joints by installing backer rod and compatible sealant after coating installation is completed. Provide sealant type recommended by manufacturer for traffic conditions and chemical exposures to be encountered.

### **3.05 FIELD QUALITY CONTROL**

- A. Material Sampling: Owner may at any time and any numbers of times during resinous flooring application require material samples for testing for compliance with requirements.
  1. Owner will engage an independent testing agency to take samples of materials being used. Material samples will be taken, identified, sealed, and certified in presence of Contractor.
  2. Testing agency will test samples for compliance with requirements, using applicable referenced testing procedures or, if not referenced, using testing procedures listed in manufacturer's product data.
  3. If test results show applied materials do not comply with specified requirements, pay for testing, remove noncomplying materials, prepare surfaces coated with unacceptable materials, and reapply flooring materials to comply with requirements.

### **3.06 CLEANING, PROTECTING, AND CURING**

- A. Cure resinous flooring materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 18 hours.
- B. Protect resinous flooring materials from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application. General Contractor is responsible for protection and cleaning of surfaces after final coats.
- C. Cleaning: Remove temporary covering and clean resinous flooring just prior to final inspection. Use cleaning materials and procedures recommended by resinous flooring manufacturer

### **END OF SECTION**





**SECTION 09 6816  
SHEET CARPETING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Carpet, direct-glued.
- B. Accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied carpet.

**1.03 REFERENCE STANDARDS**

- A. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring 2022.
- B. CRI 104 - Standard for Installation of Commercial Carpet 2015.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate seaming plan, method of joining seams, direction of carpet pile and pattern, location of edge moldings and edge bindings.
- C. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- D. Samples: Submit three samples 12 by 12 inch in size illustrating color and pattern for each carpet material specified.
- E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- F. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
  - 1. Instruct the owner's personnel in the care and maintenance of the flooring. Instruction and maintenance shall be performed by the flooring subcontractor and a representative of the flooring manufacturer. Refer to Section 01 7800 - Closeout Documents for additional requirements and information.
  - 2. The demonstration shall include written guidelines for the proper equipment, operation, materials and manufacturers recommended schedule of maintenance. See Section 01 7900 - Demonstration and Training for additional information.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional requirements.
  - 2. All attic stock to be placed on pallets, shrink-wrapped, and clearly marked with campus. Attic stock to be delivered to TISD Warehouse, with transmittal, and verified with Owner upon delivery. Owner-signed transmittal to be included in close-out documents.
  - 3. Extra Carpet: Quantity equal to 2 percent of total installed of each color and pattern installed.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet with minimum five years documented experience.
- B. Installer Qualifications: Company specializing in installing carpet with minimum five years documented experience.

**1.06 FIELD CONDITIONS**

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.

- B. Maintain minimum 70 degrees F ambient temperature 24 hours prior to, during and 24 hours after installation.
- C. Ventilate installation area during installation and for 72 hours after installation.

#### **1.07 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Submit a written warranty, executed by the Contractor, Installer, and Manufacturer, agreeing to repair or replace tile that fails in materials or workmanship within the specified warranty period.
  - 1. Warranty Period: One (1) year after date of Substantial Completion.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Carpet:
  - 1. Tandus Centiva: [www.tandus-centiva.com](http://www.tandus-centiva.com).
  - 2. Substitutions: See Section 01 6000 - Product Requirements.

#### **2.02 CARPET**

- A. Carpet:
  - 1. Product Line / Color: See Schedule of Materials and Colors.
  - 2. Fiber Characteristics
    - a. Fiber: Bulked Continuous Filament (BCF) Nylon in a loop pile construction TDX Nylon.
    - b. Static Control: Fiber to contain carbon-core filament. Topical treatments are not acceptable.
    - c. Stain Inhibitor: Applied to the fiber during product manufacturing to resist fiber staining and soiling.
  - 3. Cushion Characteristics
    - a. Primary Backing: Synthetic Non-Woven.
    - b. Secondary Backing: Powerbond Closed Cell Cushion
      - 1) Product Size: 6-Foot Wide Roll Goods.
      - 2) Cushion Type: Closed Cell Cushion.
      - 3) Cushion Thickness: .156 inch.
      - 4) Cushion Density (ASTM D1667): Min. 18.5 lbs/cu ft.
      - 5) Compression Set (ASTM D1667): Maximum 10%.
      - 6) Compression Force Deflection (ASTM D1667): Minimum 7 lbs/sq. inch @ 25%; Maximum 25 lbs/sq. inch at 25%.
      - 7) Moisture Barrier: Impermeable to moisture and airflow. Moisture Penetration by Impact @ 10 psi: No penetration of backing after 10,000 impacts. Provide independent test results. The British Spill Test is NOT an acceptable measurement for moisture barrier.
      - 8) Seam Method: Chemical weld; molecularly bound seams to be impermeable to moisture and airflow
      - 9) Seam Integrity: Moisture Penetration by Impact at SEAMS @ 10 psi; No penetration after 10,000 impacts. Provide independent test results. The British Spill Test is NOT an acceptable measurement for moisture barrier.
      - 10) Seam Integrity: Phillips Chairs Test: No seam separation after 50,000 cycles; Provide independent test results
      - 11) Face yarn fully fused to secondary backing system that will not delaminate
      - 12) Delamination: No delamination per ASTM D3936
      - 13) Product must not contain pesticides (US EPA Registered Antimicrobials).  
Installation adhesives are exempt from this section.

#### **2.03 ACCESSORIES**

- A. Sub-Floor Filler: Type recommended by carpet manufacturer.

- B. Edge Strips: Vinyl, color as selected.
- C. Adhesives:
  - 1. Provide only high moisture and alkali tolerant type adhesive as recommended by the manufacturer of the material being installed.
  - 2. Contact manufacturer for recommended adhesive if pH levels exceed 9 or MVER exceeds 5 pounds.
  - 3. Asphalt emulsions and other non-waterproof adhesives will not be acceptable.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive carpet.
- B. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesives to sub floor surfaces.
- C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for flooring installation by testing for moisture and alkalinity (pH).
  - 1. Test in accordance with ASTM F710.
  - 2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.
- D. Verify that required floor-mounted utilities are in correct location.

### **3.02 PREPARATION**

- A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- B. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.
- C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
- D. Clean substrate.

### **3.03 INSTALLATION - GENERAL**

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. Install carpet and cushion in accordance with manufacturer's instructions and CRI 104 (Commercial).
- C. Verify carpet match before cutting to ensure minimal variation between dye lots.
- D. Lay out carpet and locate seams in accordance with shop drawings.
  - 1. Locate seams in area of least traffic, out of areas of pivoting traffic, and parallel to main traffic.
  - 2. Do not locate seams perpendicular through door openings.
  - 3. Align run of pile in same direction as anticipated traffic and in same direction on adjacent pieces.
  - 4. Locate change of color or pattern between rooms under door centerline.
  - 5. Provide monolithic color, pattern, and texture match within any one area.
- E. Install carpet tight and flat on subfloor, well fastened at edges, with a uniform appearance.

### **3.04 DIRECT-GLUED CARPET**

### **3.05 CLEANING**

- A. Remove excess adhesive from floor and wall surfaces without damage.
- B. Clean and vacuum carpet surfaces.
- C. Provide a heavy non-staining paper or plastic walkway as required over carpeting in direction of traffic, maintaining intact until carpeted space is accepted by the Owner.

**3.06 CLOSEOUT ACTIVITIES**

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

**END OF SECTION**

**SECTION 09 7223**  
**CUSTOM DIGITAL WALL COVERING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Custom Digital Wall Covering.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 1000 - Rough Carpentry
- B. Section 09 2982 - Gypsum Board

**1.03 REFERENCE STANDARDS**

- A. ASTM D1308 - Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Coating Systems 2020.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023b.
- C. ASTM F793/F793M - Standard Classification of Wall Coverings by Use Characteristics 2020.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on wall covering and adhesive.
- C. Shop Drawings: Indicate wall elevations with seaming layout.
- D. Samples: Samples and strike-offs shall be sent to the Architect/Designer and Owner for final approval.
- E. No product shall be fabricated or installed without signature and approval of the Owner.
- F. Test Reports: Indicate verification of flame and smoke ratings, when tested by UL.
- G. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention. All special instructions shall be provided by the Manufacturer to the Contractor.
- H. Maintenance Data: Submit data on cleaning, touch-up, and repair of covered surfaces.
- I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. Provide final digital print files, shop drawings and product data for Owner's use.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section with minimum three years of experience.
- B. Installer Qualifications: Company specializing in performing the type of work specified in this section with minimum three years of experience.
- C. Applicator Qualifications: Work of this section shall be performed by a firm regularly engaged in the installation of environmental graphics of the types and qualities specified, coordinated by Manufacturer/Contractor, and acceptable to the Architect/Designer.
- D. Field verifications/dimensions shall be sent to the General Contractor and coordinated with the Installer and Manufacturer before any artwork is to be printed or executed. Graphics company shall coordinate a trip with the contractor to the site to pre-measure walls prior to the release of any material.
- E. Color match on graphic prints may have some slight variability due to printer and monitor calibration.

**1.06 MOCK-UP**

- A. Locate where directed.

- B. Mock-up may remain as part of the Work.
- C. Architect/Designer may provide additional drawings to clarify design intent if required.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Inspect roll materials at arrival on site, to verify acceptability.
- B. Protect packaged adhesive from temperature cycling and cold temperatures.
- C. Do not store roll goods on end.

#### **1.08 FIELD CONDITIONS**

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the adhesive or wall covering product manufacturer.
- B. Maintain these conditions 24 hours before, during, and after installation of adhesive and wall covering.

### **PART 2 PRODUCTS**

#### **2.01 CUSTOM DIGITAL WALL COVERING**

- A. Custom Digital Wall Covering:
  - 1. Digital wall covering shall be certified 20 oz. (457g/m<sup>2</sup>) Type II, Class "A" vinyl for solvent, eco-solvent, UV curable and latex inks.
    - a. Basis of Design: See Section 01 6210 - Schedule of Materials and Colors for product selection.
    - b. Manufacturers:
      - 1) Building Image Group: [www.buildingimagegroup.com](http://www.buildingimagegroup.com)
      - 2) MDC Wallcoverings: [www.mdcwall.com](http://www.mdcwall.com)
      - 3) Reprographic Consultants: [www.reprocon.com](http://www.reprocon.com)
      - 4) Riot Creative Imaging: [www.riotcolor.com](http://www.riotcolor.com)
      - 5) Tri-Kes/Source One: [www.tri-kes.com](http://www.tri-kes.com)
      - 6) Waterboy Graphics: [www.waterboygraphics.com](http://www.waterboygraphics.com)
      - 7) Substitutions: See Section 01 6000 - Product Requirements.
  - 2. Physical Properties
    - a. Width: 54" or 60"
    - b. Product Weight: 20 oz. per lineal yd. (13oz. per sq. yd.)
    - c. Vinyl Weight: 17 oz. per lineal yd.
    - d. Fabric Weight: 3 oz. per lineal yd.
    - e. Thickness: 0.017 to 0.027 depending on texture
    - f. Fabric: Woven Poly Cotton Osnaburg
  - 3. Tensile Strengths
    - a. Warp - Exceeds Type II minimum of 50 lbs.
    - b. Fill - Exceeds Type II minimum of 55 lbs.
  - 4. Tear Strengths
    - a. Warp - Exceeds Type II minimum of 25 lbs.
    - b. Fill - Exceeds Type II minimum of 25 lbs.
  - 5. Fire Testing
    - a. Meets or exceeds requirements for flame spread, smoke developments and flashover
    - b. ASTM-E84 Tunnel Test: Class A
    - c. NFPA286 Corner Burn Test: Class A
    - d. NFPA265 Corner Burn Test: Class A
  - 6. Mold/Mildew/Bacterial Resistance
    - a. ASTM-G21: Passed all requirements of CCCW-408-D
  - 7. Color Mode and Image Resolution: All images and files shall be submitted and printed in CMYK color mode. Image resolution for offset and digital print shall be 300 DPI at final size. Image resolution for wide format print shall be minimum 125 DPI at final size.

8. All vinyl wall coverings located on exterior walls shall be micro-perforated for permeability.
- B. Accessories
  1. Adhesive: Type recommended by wall covering manufacturer to suit application to substrate.
  2. Termination Trim: Extruded plastic, color as selected.
  3. Substrate Filler: As recommended by adhesive and wall covering manufacturers; compatible with substrate.
  4. Substrate Primer and Sealer: Alkyd enamel type.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that substrate surfaces are ready to receive work, and conform to requirements of the graphics manufacturer.
- B. Measure moisture content of surfaces using an electronic moisture meter. Do not apply wall coverings if moisture content of substrate exceeds level recommended by wall covering manufacturer.
- C. Verify flatness tolerance of surfaces does not vary more than 1/8 inch in 10 feet nor vary at a rate greater than 1/16 inch/ft.
- D. Upon discovery of unacceptable conditions, including but not limited to, finish level, light switches, outlet covers, supply/return grills and any other obstructions within the graphic area, the installer will notify the client and Architect/Designer and not proceed until the conditions are acceptable. Starting installation constitutes acceptance of surface conditions.

### **3.02 PREPARATION**

- A. Fill cracks in substrate and smooth irregularities with filler; sand smooth.
- B. Wash impervious surfaces with tetra-sodium phosphate, rinse and neutralize; wipe dry.
- C. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
- D. Surfaces: Correct defects and clean surfaces that affect work of this section. Remove existing coatings that exhibit loose surface defects.
- E. Marks: Seal with shellac those that may bleed through surface finishes.
- F. Apply one coat of primer sealer to substrate surfaces. Allow to dry. Lightly sand smooth.
- G. Vacuum clean surfaces free of loose particles.

### **3.03 INSTALLATION**

- A. Apply adhesive and wall covering in accordance with manufacturer's instructions.
- B. Apply adhesive to wall surface immediately prior to application of wall covering. Let contact adhesive set tack free.
- C. Use wall covering in roll number sequence.
- D. Razor trim edges on flat work table. Do not razor cut on gypsum board surfaces.
- E. Apply wall covering smooth, without wrinkles, gaps or overlaps. Eliminate air pockets and ensure full bond to substrate surface. Butt edges tightly.
- F. Horizontal seams are not acceptable.
- G. Do not seam within 2 inches of internal corners or within 6 inches of external corners.
- H. Install wall covering before installation of bases and items attached to or spaced slightly from wall surface.
- I. Do not install wall covering more than 1/4 inch below top of resilient base.
- J. Cover spaces above and below windows, above doors, in pattern sequence from roll.

- K. Before cutting, field install to layout environmental design elements in accordance with submittal drawings and any additional design intent drawings provided by Architect/Designer for installation reference. Examine each element for color consistency, accuracy, and proper design dimension.
- L. Request inspection by the Architect/Designer if there are variations in color, pattern, or design that are considered to be excessive.
- M. Where wall covering tucks into reveals, or metal wallboard or plaster stops, apply with contact adhesive within 6 inches of wall covering termination. Ensure full contact bond.
- N. Install termination trim.
- O. Remove excess adhesive while wet from seam before proceeding to next wall covering sheet. Wipe clean with dry cloth.

#### **3.04 CLEANING**

- A. Clean wall coverings of excess adhesive, dust, dirt, and other contaminants.
- B. Reinstall wall plates and accessories removed prior to work of this section.

#### **3.05 PROTECTION**

- A. Do not permit construction activities at or near finished graphics areas.

**END OF SECTION**



**SECTION 09 7400  
LINEAR WOOD WALL SYSTEM**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Linear Wood Wall Systems
- B. Edges, borders and perimeter trims

**1.02 RELATED REQUIREMENTS**

- A. The General Conditions and the requirements of Division 1 of the specifications shall apply to all work hereunder.
- B. All work shall be completed in accordance with the manufacturer's instructions, and in a manner satisfactory to the owner's representative.

**1.03 RELATED WORK NOT INCLUDED UNDER THIS SECTION**

- A. Attachment systems and components for walls, other than manufacturer's Linear Wood System, are not included.

**1.04 QUALITY ASSURANCE**

- A. Installer Qualifications: The installer must be a firm with a minimum of two (2) years of successful experience in installation of wood systems of similar requirements to this project. The installer must be acceptable to the architect, manufacturer, and owner's representative.
- B. Fire Performance Characteristics: Wood boards shall conform to Class 1, or A flame spread rating, when tested according to ASTM E-84.
- C. Environmental Standards: When required the wood shall originate from well managed forests as certified by accredited and recognized industry certifying organizations.

**1.05 PROJECT CONDITIONS**

- A. Installation shall be done only when the temperature and humidity closely approximate the interior conditions that will exist when the building is occupied. The heating and cooling systems shall be operating before, during, and after installation; with the humidity of the interior spaces maintained between 25% and 55%, temperature between 60 to 90 degrees F.
- B. It is important that plenums have proper ventilation, especially in high moisture areas. There shall be no excessive build up of heat in the wall areas.
- C. Prior to the start of installation, all exterior windows and doors are to be in place, glazed, and weather-stripped. The roof is to be watertight, and all wet trades' work is to be completed, and thoroughly dry.
- D. Mechanical, electrical, and other utility service installations beyond the wall plane shall have been completed. No materials should rest against, or wrap around, the wall attachment components.

**1.06 COORDINATION OF WORK**

- A. The layout and installation of Linear Wood Panels shall be coordinated with other work penetrating the wall.

**1.07 SUBMITTALS**

- A. Product Data: Manufacturer shall provide product specifications and installation instructions for all supplied wall materials.
- B. Shop Drawings: Supply shop drawings showing Panel lengths and placement, and other details deemed pertinent to proper installation.
- C. Samples: A 12" wide x 12" long wood wall sample, in the specified Linear Wood Panel style, with finish applied, shall be submitted for approval.

## **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Linear Wood Panels and components shall be delivered to the project site in original, unopened packages.
- B. The Linear Wood Panels shall be stored flat and level in a fully enclosed space. For a minimum of seventy-two (72) hours immediately prior to wall installation, the Linear Wood Panels shall be stored in the room in which they will be installed. The temperature and humidity of the room shall closely approximate those conditions that will exist when the building is occupied. The Linear Wood Panels must be stored off the floor.
- C. Care in handling must be exercised to avoid damage.

## **1.09 WARRANTIES**

- A. Manufacturer: All materials supplied by the panel manufacturer shall be guaranteed against manufacturing defects for one (1) year. Because of differing site conditions, wood stains and colorings can vary with age, and are excluded from this warranty.
- B. Contractor: All work shall be guaranteed for one (1) year from final acceptance of completed work.

## **PART 2 - PRODUCT**

### **2.01 MANUFACTURERS**

- A. ACGI/Armstrong World Industries, Inc: [www.armstrongceilings.com/#sle](http://www.armstrongceilings.com/#sle).
- B. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 LINEAR WOOD PANELS**

- A. Basis of Design: Encore Series 1 acoustical wood system as manufactured by ACGI.
- B. Plank Size: 7.5" wide by 3/4" thick.
- C. Face Profile: 10mm on center.
- D. Specie: As scheduled on the drawings.

### **2.03 SUSPENSION SYSTEMS**

- A. Linear Wood Panels shall be installed according to manufacturers suggested method of suspension.

### **2.04 EDGES, BORDERS, AND PERIMETER TRIMS**

- A. Edges, borders, and perimeter trims, shall be designated by specifier in accordance with standard design details available. All wood wall products specified shall be supplied by the panel manufacturer.

### **2.05 FINISHES AND COLORS**

- A. All Linear Wood Panels shall be factory-finished with clear sealers, wood stains, or semi-transparent color treatments as selected. All finishes shall be selected by the designer, architect, or designated owner's representative. See Schedule of Materials and Colors on the drawings.

## **PART 3 - EXECUTION**

### **3.01 PREPARATION**

- A. Layout: The contractor shall measure wall areas, and establish layout of Linear Wood Panels and furring strips, in accordance with installation instructions.
- B. Coordination: The contractor shall furnish the layout for supports that shall be installed for attachment of the wall panels.

### **3.02 INSTALLATION**

- A. General: The contractor shall install materials in accordance with manufacturers printed instructions. The installation shall comply with applicable regulations and industry standards.

- B. Attachment: Linear Wood Panels shall be installed to furring strips by using either direct screw or 'Z' clips.

**3.03 ADJUSTMENT, CLEANING, AND REPAIR**

- A. The contractor shall make final adjustments to level or contours.
- B. Upon completion of ceiling installation, all Linear Wood Panels and borders shall be cleaned free of dirt, dust, grease, oils, and fingerprints.
- C. All work which cannot be successfully cleaned or repaired shall be removed and replaced.

**3.04 INSPECTION**

- A. Upon completion of installation, the owner's representative shall inspect all finished surfaces to ensure that work has been performed in a manner satisfactory to the owner. Any deficiencies in the installed wall shall be corrected by the contractor at no additional cost to the owner, or to the wall panel manufacturer.

**END OF SECTION**



**SECTION 09 8400  
ACOUSTICAL PANELS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Fabric-covered fiberglass core panels and mounting accessories.
- B. Damage resistant fabric-covered fiberglass core panels and mounting accessories.
- C. Formed fire resistant plastic panels
- D. Cementitious wood fiber acoustical panels

**1.02 RELATED REQUIREMENTS**

- A. Section 09 5100 - Acoustical Ceilings

**1.03 REFERENCE STANDARDS**

- A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method 2023.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023b.
- C. ASTM E795 - Standard Practices for Mounting Test Specimens During Sound Absorption Tests 2023.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed data sheets for products specified.
- C. Shop Drawings: Fabrication and installation details, panel layout, and fabric orientation.
- D. Selection Samples: Manufacturer's color charts for fabric covering, indicating full range of fabrics, colors, and patterns available .
- E. Verification Samples: Fabricated samples of each type of panel specified; 12 by 12 inch, showing construction, edge details, and fabric covering.
- F. Test Reports: Certified test data from an independent test agency verifying that panels meet specified requirements for acoustical and fire performance.
- G. Closeout Submittals
  - 1. Submit under provisions of Section 01 7800 - Closeout Submittals.
  - 2. Submit Material Safety Data Sheets under provisions of Section 01 7800 - Closeout Submittals for the following items:
    - a. All mastics, glues, and adhesives
    - b. Thermal insulation (excluding fiberglass, foam, rubber)

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company with not less than five years of experience in manufacturing acoustical products similar to those specified.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Protect acoustical panels from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until panels are needed for installation.
- B. Store panels flat, in dry, well-ventilated space; do not stand panels on end.
- C. Protect panel edges from damage.

**1.07 WARRANTY**

- A. Comply with requirements of Section 01 7800 - Closeout Submittals.

- B. Submit a written warranty, executed by the Contractor, agreeing to repair or replace panels that fail in materials or workmanship within the specified warranty period.
  - 1. Warranty Period: Two (2) years after date of Substantial Completion.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Fabric-Covered Acoustical Panels:
  - 1. Armstrong World Industries, Inc: [www.armstrong.com](http://www.armstrong.com).
  - 2. AVL Systems, Inc.: [www.AVLonline.com](http://www.AVLonline.com)
  - 3. CertainTeed Corporation: [www.certainteed.com](http://www.certainteed.com).
  - 4. Conwed Designscape | Wall Technology: [www.conweddesignscape.com](http://www.conweddesignscape.com).
  - 5. Essi Acoustical Products Company: [www.essiacoustical.com](http://www.essiacoustical.com).
  - 6. Quiet Technology Systems: [www.qtechsys.com](http://www.qtechsys.com)
  - 7. USG: [www.usg.com](http://www.usg.com).
  - 8. Wenger Corporation: [www.wengercorp.com](http://www.wengercorp.com).
  - 9. Substitutions: See Section 01 6000 - Product Requirements.
- B. Cementitious Wood Fiber Acoustical Panels
  - 1. Cardinal Acoustics: [www.cardinalacoustics.com](http://www.cardinalacoustics.com)
  - 2. Tectum, Inc.: [www.tectum.com](http://www.tectum.com)
  - 3. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 FABRIC-COVERED ACOUSTICAL PANELS**

- A. Panels: Prefinished, factory assembled fabric-covered panels.
  - 1. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
- B. Fiberglass Core Panels: Typical, Unless Noted Otherwise
  - 1. Density: 6 to 7 lb/cu ft.
  - 2. Noise Reduction Coefficient (NRC): 0.80 to 0.90 when tested in accordance with ASTM C423 for Type A mounting, per ASTM E795.
  - 3. Panel Width: As detailed.
  - 4. Panel Height: As detailed.
  - 5. Panel Thickness: 2 inch.
  - 6. Edges: Perimeter edges reinforced by a formulated resin hardener.
  - 7. Edge Profile: Beveled
  - 8. Corners: Square.
  - 9. Mounting: Mounting shall be continuous Z-bars per architectural drawings. All mountings are supplied by the manufacturer unless noted otherwise.
- C. Fiberglass Core Panels: Gymnasiums or Activity Rooms
  - 1. Density: 6 to 7 lb/cu ft.
  - 2. 2 inch cores laminated with a 1/16" thick perforated resilient damage resistant face sheet
  - 3. Noise Reduction Coefficient (NRC): 1.00 minimum when tested in accordance with ASTM C423 for Type A mounting, per ASTM E795.
  - 4. Panel Width: As detailed.
  - 5. Panel Height: As detailed.
  - 6. Panel Thickness: 2-1/16 inch.
  - 7. Edges: Perimeter edges reinforced by a formulated resin hardener.
  - 8. Edge Profile: Square
  - 9. Corners: Square.
  - 10. Mounting: Mounting shall be continuous Z-bars per architectural drawings. All mountings are supplied by the manufacturer unless noted otherwise.
- D. Fiberglass Core and Formed Fire Resistant Plastic Panels: Band and Choir Rooms
  - 1. Absorber Panels:

- a. Fiberglass Core Density: 6 to 7 lb/cu ft.
  - b. Edges: Perimeter edges reinforced by a formulated resin hardener.
  - c. Panel Thickness: 2 inch at Music, Choir and 4 inch at Band Halls.
  - d. Edge Profile: Square
  - e. Corners: Square.
2. Diffuser Panels:
  - a. Diffuser Construction: 0.125 inch Thermo-formed fire resistant plastic molded to a one-piece Barrel or a special offset Pyramidal shape.
  - b. All diffuser panels constructed of Class A materials (NFPA 101 Life Safety Code Requirements for Class A Interior Finishes are: Flame Spread 0-25, Smoke Developed 0-450).
  - c. Edge Profile: No flange for walls and hardware ceiling mount.
  - d. Corners: Radiused.
3. Acoustical Performance Requirements
  - a. Sound absorption coefficients, measured with a Type A and Type E-400 mounting, according to ASTM E795 (if applicable) or according to application mounting method, determined by ASTM C423.
  - b. Sound Transmission Class (STC), determined according to ASTM E90 and ASTM E413: Type I convex ceiling diffuser panel, 4' x 4'; STC 23; Type I pyramidal ceiling diffuser panel, 4' x 4'; STC 22.
4. Finishes
  - a. Ceiling/Wall-mounted absorber panels: Fabric wrap entire core and glued to back of panel.
  - b. Ceiling/Wall-mounted diffuser panels: Manufacturer's standard white, "orange peel" texture.
5. Mounting Hardware
  - a. Wall mounting (absorbers and diffusers): Continuous wall and panel Z-bars per architectural drawings. Provide 2" minimum clearance above top of panel for placement and removal of panel.
  - b. Ceiling mounting (absorbers and diffusers): Four corner hook suspended by wire to ceiling; lay-in hardware for ceiling grid; (minimum frame width 15/16"); direct ceiling mounting hardware.
6. Panel Width: As detailed.
7. Panel Height: As detailed.
- E. Fabric Covering: Seamless fabric facing material, for bonded covering of core material.
  1. Fabric shall be applied directly to the face and edges of the panel and return to the back of the panel to provide a full finished edge. All corners are fully tailored.
  2. Fabric: See Section 01 6210 - Schedule of Materials and Colors for fabric selection.
  3. Patterns: Where fabric with directional or repeating patterns or fabric with directional weave is used, mark for installation in same direction.

### **2.03 CEMENTITIOUS WOOD FIBER ACOUSTICAL PANELS**

- A. Standard Interior Wall Panels:
  1. Material: Aspen wood fibers bonded with inorganic hydraulic cement.
  2. Thickness: 2 inch.
  3. Panel Dimensions: Reference drawings
  4. Color: Painted, See Section 01 6210 - Schedule of Materials and Colors
  5. Mounting: Mounting shall be continuous Z-bars per architectural drawings. All mountings are supplied by the manufacturer unless noted otherwise.
  6. Performance Requirements:
    - a. Provide acoustical wall panel assembly designed and tested to provide surface burning characteristics (ASTM E84) as follows:
      - 1) Flamespread: 0.
      - 2) Smoke Developed: 0.

- b. Provide acoustical wall panel system which has been manufactured, fabricated and installed to provide Noise Reduction Coefficient (NRC) rating as follows:
  - 1) Panel thickness of 2 inches: 0.60 minimum.

#### **2.04 FABRICATION**

- A. Fabric Wrapped, General: Fabricate panels to sizes and configurations indicated, with fabric facing installed without sagging, wrinkles, blisters, or visible seams.
  - 1. Where radiused or mitered corners are indicated, install fabric to avoid seams or gathering of material.
- B. Tolerances: Fabricate to finished tolerance of plus or minus 1/16 inch for thickness, overall length and width, and squareness from corner to corner.

#### **2.05 ACCESSORIES**

- A. Back-Mounting Accessories: Manufacturer's standard accessories for concealed support, designed to allow panel removal, and as follows:
  - 1. Mounting shall be continuous Z-bars per architectural drawings. All mountings are supplied by the manufacturer unless noted otherwise
- B. Ceiling-Suspended Accessories: Manufacturer's standard through-threaded eyelets bolted through concealed perimeter frame at 1/4 points on each panel, sized appropriately for weight of panels.
  - 1. Provide galvanized wire for suspension from ceiling at heights indicated.
- C. Trim Moldings: Manufacturer's standard wood or vinyl trim moldings for concealing panel joints; color as selected from manufacturer's standards.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine substrates for conditions detrimental to installation of acoustical panels. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.02 INSTALLATION**

- A. Install acoustical panels in locations indicated, following installation recommendations of panel manufacturer. Align panels accurately, with edges plumb and top edges level. Scribe to fit accurately at adjoining work and penetrations.
- B. Install panels to construction tolerances of plus or minus 1/16 inch for the following:
  - 1. Plumb and level.
  - 2. Flatness.
  - 3. Width of joints.

#### **3.03 CLEANING**

- A. Clean fabric facing upon completion of installation from dust and other foreign materials, following manufacturer's instructions.
- B. Remove surplus materials, trimmed portions of panels, and debris resulting from installation.

#### **3.04 PROTECTION**

- A. Provide protection of installed acoustical panels until completion of the work.
- B. Replace panels that cannot be cleaned and repaired to satisfaction of the Architect.

**END OF SECTION**



**SECTION 09 9000  
PAINTING AND COATING**

**PART 1 - GENERAL**

**1.01 SUMMARY**

- A. Related Documents: General and Supplementary Conditions of the Contract, Division 01 General Requirements, and Drawings are applicable to this Section.
- B. Section Includes, but is not limited to:
  - 1. Exterior paints and coatings systems including; paints, stains, transparent coatings, and opaque finishes.
  - 2. Interior paint and coatings systems including; paint, stains, transparent coatings, and opaque finishes.
  - 3. Specific products and painting scheduled in this Section are based, in general, on products of Sherwin-Williams Company (noted SW). Products of other manufacturers listed in paragraph 2.01 may be substituted with approved color matches.

**1.02 RELATED SECTIONS**

- A. Section 05 2100 - Steel Joist Framing: Shop priming
- B. Section 05 5000 - Metal Fabrications: Shop priming
- C. Section 06 2000 - Finish Carpentry: Back priming of trim and paneling
- D. Section 07 8123 - Intumescent Fire Protection: Field-applied paints coordination with intumescent fireproofing substrate.
- E. Division 23 - Mechanical Identification: Markers and color-coding
- F. Division 26 - Electrical Identification: Markers and color-coding

**1.03 REFERENCES**

- A. Industry Association Standards
  - 1. SSPC-SP 1 - Solvent Cleaning.
  - 2. SSPC-SP 2 - Hand Tool Cleaning.
  - 3. SSPC-SP 3 - Power Tool Cleaning.
  - 4. SSPC-SP 13 / NACE No. 6 Surface Preparation for Concrete.

**1.04 DEFINITIONS**

- A. Paint
  - 1. Means coating systems materials including primers, emulsions, epoxy, enamels, sealers, fillers, and other applied materials whether used as prime, intermediate, or finish coats.

**1.05 SUBMITTALS**

- A. Shop drawings, product data, and samples under provisions of Section 01 3000 - Administrative Requirements.
- B. Product Data: Manufacturer's data sheets on each paint and coating product should include:
  - 1. Product characteristics
  - 2. Surface preparation instructions and recommendations
  - 3. Primer requirements and finish specification
  - 4. Storage and handling requirements and recommendations
  - 5. Application methods
  - 6. Cautions
- C. Selection Samples: Submit a complete set of color chips that represent the full range of manufacturer's color samples available.
- D. Verification Samples: For each finish product specified, submit 8"x10" samples that represent actual product, color, and sheen.

- E. Closeout Submittals
  - 1. Submit under provisions of Section 01 7800 - Closeout Submittals.
  - 2. Upon conclusion of the project, the Contractor or paint manufacture/supplier shall furnish a coating maintenance manual, such as Sherwin-Williams "Custodian Project Color and Product Information" report or equal. Manual shall include an Area Summary with finish schedule, Area Detail designating where each product/color/finish was used, product data pages, Material Safety Data Sheets, care and cleaning instructions, touchup procedures, and color samples of each color and finish used.

#### **1.06 QUALITY ASSURANCE**

- A. Qualifications
  - 1. Single Source Responsibility:
    - a. Obtain each type of material required from single source.
- B. Pre-installation Meetings
  - 1. Comply with provisions of Section 01 3000 - Administrative Requirements.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with requirements of Section 01 6000 - Product Requirements.
- B. Delivery: Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacturer's name, label, and the following list of information:
  - 1. Product name, type (description)
  - 2. Application and use instructions
  - 3. Surface preparation
  - 4. VOC content
  - 5. Environmental issues
  - 6. Batch date
  - 7. Color number
- C. Storage: Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
- D. Store materials in an area that is within the acceptable temperature range, per manufacturers instructions. Protect from freezing.
- E. Handling: Maintain a clean, dry storage area, to prevent contamination or damage to the coatings.

#### **1.08 PROJECT CONDITIONS**

- A. Project Environmental Requirements
  - 1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not apply coatings under environmental conditions outside manufacturer's absolute limits.

#### **1.09 MAINTENANCE**

- A. Extra Materials
  - 1. At completion of project, deliver to Owner extra stock of materials used on project as follows:
    - a. Ten (10) gallons for each field color/type, three (3) gallons for trim and accent of each color/type.
  - 2. Store in location as directed by Owner.
  - 3. Ensure containers are sealed and identified by manufacturer, type, and color.
  - 4. Submit maintenance data under provisions of Section 01 7800 - Closeout Submittals.
  - 5. Include cleaning methods, and recommended cleaning solutions.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Subject to compliance with requirements indicated herein, provide products of one of the listed manufacturers.
- B. Sherwin-Williams Co.: [www.sherwin-williams.com](http://www.sherwin-williams.com).
- C. Kelly-Moore Paints: [www.kelleymoore.com](http://www.kelleymoore.com).
- D. PPG Paints: [www.ppgpaints.com](http://www.ppgpaints.com)
- E. Benjamin Moore & Co.: [www.benjaminmoore.com](http://www.benjaminmoore.com).
- F. TNEMEC Company Inc.: [www.tnemec.com](http://www.tnemec.com).
- G. Substitutions: Under provisions of Section 01 6000 - Product Requirements.

### **2.02 MATERIALS - GENERAL**

- A. Paints and Coatings - General:
  - 1. Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.
  - 2. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
- B. Primers:
  - 1. Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
- C. Compatibility with other materials:
  - 1. Topcoats: Suitable for application over applied intumescent coatings; of type recommended in writing by intumescent coatings manufacturer for each fire resistance design. Topcoat to have been tested by manufacturer for compatibility in fire conditions with documentation of such tests to be provided upon request. Color of topcoat shall be as selected by the architect. Colors shall not be limited to manufacturer's standard colors.
  - 2. See Section 07 8123 - Intumescent Fire Protection for additional information.

### **2.03 COLOR SCHEDULES**

- A. Color schedule in Section 01 6210 - Schedule of Materials and Colors.
- B. The Architect may select, allocate, and vary colors on different surfaces throughout the Work, subject to the following.
  - 1. Exterior work: A maximum of three (3) different colors will be used, with variations for trim, doors, miscellaneous work, and metal work.
  - 2. Interior work: A maximum of ten (10) different pigmented colors will be used, with variations for trim and wall surfaces and wainscots.
  - 3. Dark tones: A maximum of five (5) dark tones will be used as accent colors for interior.
- C. All painted graphics shown on the drawings shall be included in the base proposal and shall be included in this section. Contractor shall note that school colors and mascot may be released after initial color selection. Contractor shall make all necessary adjustments.

### **2.04 MISCELLANEOUS MATERIALS**

- A. Coating Application Accessories
  - 1. Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required per manufacturer's specifications.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Do not begin application of coatings until substrates have been properly prepared. Notify Architect of unsatisfactory conditions before proceeding
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Proceed with work only after conditions have been corrected, and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.

### **3.02 PREPARATION**

- A. Comply with provisions of Section 01 7000 - Execution and Closeout Requirements.
- B. The surface must be dry and in sound condition. Remove oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion.
- C. Remove mildew before painting by washing with a solution of 1 part liquid household bleach and 3 parts of warm water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes. Rinse thoroughly with clean water and allow the surface to dry 48 hours before painting. Wear protective glasses or goggles, waterproof gloves, and protective clothing. Quickly wash off any of the mixture that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.
- D. No exterior painting should be done immediately after a rain, during foggy weather, when rain is predicted, or when the temperature is below 50°F, unless products are designed specifically for these conditions.
- E. Methods:
  - 1. Concrete Masonry Units
    - a. Remove all loose mortar and foreign material. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement, and hardeners. Concrete and mortar must be cured at least 30 days at 75°F. The pH of the surface should be between 6 and 9, unless the products to be used are designed to be used in high pH environments such as Loxon. On tilt-up and poured-in-place concrete, commercial detergents and abrasive blasting may be necessary to prepare the surface. Fill bug holes, air pockets, and other voids with a cement patching compound.
  - 2. Concrete, SSPC-SP13 or NACE 6
    - a. This standard gives requirements for surface preparation of concrete by mechanical, chemical, or thermal methods prior to the application of bonded protective coating or lining systems. The requirements of this standard are applicable to all types of cementitious surfaces including cast-in-place concrete floors and walls, precast slabs, masonry walls, and shotcrete surfaces. An acceptable prepared concrete surface should be free of contaminants, laitance, loosely adhering concrete, and dust, and should provide a sound, uniform substrate suitable for the application of protective coating or lining systems.
  - 3. Drywall-Interior
    - a. Must be clean and dry. All nail heads must be set and spackled. Joints must be taped and covered with a joint compound. Spackled nail heads and tape joints must be sanded smooth and all dust removed prior to painting.
  - 4. Galvanized Metal
    - a. Clean per SSPC-SP1 using detergent and water or a degreasing cleaner to remove greases and oils. Apply a test area, priming as required. Allow the coating to dry at least one week before testing. If adhesion is poor, Brush Blast per SSPC-SP7 is necessary to remove these treatments.
  - 5. Steel: Structural, Plate, Doors and Frames, etc.

- a. Should be cleaned by one or more of the surface preparations described below. All metal shall be thoroughly prepared to ensure adhesion of new paint to the prepared surface. All prepared surfaces shall be observed and approved by the Owner or Owners Representative before new paint is applied.
- b. Solvent Cleaning, SSPC-SP1
  - 1) Solvent cleaning is a method for removing all visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants. Solvent cleaning does not remove rust or mill scale. Change rags and cleaning solution frequently so that deposits of oil and grease are not spread over additional areas in the cleaning process. Be sure to allow adequate ventilation.
- c. Hand Tool Cleaning, SSPC-SP2
  - 1) Hand Tool Cleaning removes all loose mill scale, loose rust and other detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process. Before hand tool cleaning, remove visible oil, grease, soluble welding residues, and salts by the methods outlined in SSPC-SP1.
- d. Power Tool Cleaning, SSPC-SP3
  - 1) Power Tool Cleaning removes all loose mill scale, loose rust, and other detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process. Before power tool cleaning, remove visible oil, grease, soluble welding residues, and salts by the methods outlined in SSPC-SP1.
- 6. Stucco
  - a. Must be clean and free of any loose stucco. If recommended procedures for applying stucco are followed, and normal drying conditions prevail, the surface may be painted in 30 days. The pH of the surface should be between 6 and 9, unless the products to be used are designed to be used in high pH environments such as Loxon.
- 7. Wood-Exterior
  - a. Must be clean and dry. Prime and paint as soon as possible. Knots and pitch streaks must be scraped, sanded, and spot primed before a full priming coat is applied. Patch all nail holes and imperfections with a wood filler or putty and sand smooth.
- 8. Wood-Interior
  - a. All finishing lumber and flooring must be stored in dry, warm rooms to prevent absorption of moisture, shrinkage, and roughening of the wood. All surfaces must be sanded smooth, with the grain, never across it. Surface blemishes must be corrected and the area cleaned of dust before coating.

### 3.03 APPLICATION

- A. Comply with provisions of Section 01 7000 - Execution and Closeout Requirements.
- B. Testing: Due to the wide variety of substrates, preparation methods, application methods and environments, one should test the product in an inconspicuous spot for adhesion and compatibility prior to full-scale application.
- C. Apply all coatings and materials with manufacture specifications in mind. Mix and thin coatings according to manufacture recommendation.
- D. Do not apply to wet or damp surfaces.
  - 1. Wait at least 30 days before applying to new concrete or masonry. Or follow manufactures procedures to apply appropriate coatings prior to 30 days.
  - 2. Test new concrete for moisture content.
  - 3. Wait until wood is fully dry after rain or morning fog or dew.
- E. Apply coatings using methods recommended by manufacturer.
- F. Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.

- G. Apply coatings at spreading rate required to achieve the manufacturers recommended dry film thickness.
- H. Regardless of number of coats specified, apply as many coats as necessary for complete hide.
- I. All drywall installation areas shall be made ready for painting by first preparing the gypsum wallboard surfaces with texturing as specified. Apply in strict compliance with manufacturer's written directions. Omit texturing where wall carpet occurs, reference Finish Schedule on drawings.
- J. At gymnasiums, contractor shall paint wood blocking for gym equipment supports to match adjacent color. Contractor shall coordinate the sequencing with all trades.
- K. Exterior Woodwork: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 2 weeks.
- L. Miscellaneous surfaces and procedures
  - 1. Exposed mechanical items
    - a. Finish electric panels, access doors, conduits, pipes, ducts, grilles, registers, vents, and items of similar nature to match the adjacent wall and ceiling surfaces, or as directed.
    - b. Paint visible duct surfaces behind vents, registers, and grilles Sherwin Williams Pro Mar Flat Black.
    - c. Wash metal with solvent, prime, and apply two coats of alkyd enamel.
  - 2. Exposed pipe and duct insulation
    - a. Apply one coat of latex paint on insulation which has been primed under other Sections; apply two coats on such surfaces when unprepared.
    - b. Match color of adjacent surfaces.
    - c. Remove band before painting, and replace after painting.
  - 3. Hardware: Paint prime coated hardware to match adjacent surfaces.
  - 4. Wet areas
    - a. In toilet rooms and contiguous areas, add an approved fungicide to paints.
  - 5. Exposed vents: Apply two coats of heat-resistant paint approved by the Architect.
- M. Inspection: The coated surface must be inspected and approved by the architect just prior to each coat.

### **3.04 REPAIR/RESTORATION**

- A. For surfaces that are to receive new finish, prepare surface and apply materials as described below and per manufacture recommendation.
- B. Preparation of Existing Surfaces That Have Been Previously Painted or Varnished:
  - 1. The workmanship shall be best quality, and the surface shall be prepared in a thorough manner in order that the new finish shall be as finished as if the surface had been new with all the usual preparation for new paint or varnish.
  - 2. All previously painted or varnished surfaces or surfaces that have been previously finished in any manner shall first be prepared to receive new finish or any sort, according to the following specifications:
    - a. Existing painted sand finish plaster walls to be repainted
      - 1) Remove all scaled or loose paint.
      - 2) Fill all cracks in plaster as follows:
        - (a) Large cracks - caulk with latex sealant.
        - (b) Hairline cracks - Add 1 lb. of taping cement to 1 gallon of latex paint and brush across cracks until filled.
    - b. Existing enamel or varnished surfaces on smooth plaster or any surface
      - 1) Add 4 tablespoons of Tri-Sodium Phosphate per quart of paint thinner and wash surfaces to be repainted not less than 4 hours nor more than 7 hours before painting first coat.
    - c. Existing drywall partitions to receive new base.

- 1) Upon removing existing rubber base, prepare wall surface to receive new base. Surface shall be leveled to meet adjacent surface. Texture wall as required to match existing.
- C. Painting Existing Surfaces after Surfaces Have Been Prepared
  1. Sand Finish Plaster
    - a. One coat primer-sealer colored to match finish coat. Primer-sealer will be SW ProMar 200 Zero VOC Interior Latex Primer, B28W2600.
    - b. One coat of paint shown on schedule or two coats if required to fully cover for first quality finish.
  2. Concrete Masonry Units
    - a. Same as sand finish plaster.
  3. Smooth Plaster Walls
    - a. One coat SW ProMar 200 Zero VOC Interior Latex Primer, B28W2600.
    - b. Second coat will be as directed by the Architect.
  4. Varnished Surfaces to be Revarnished
    - a. Repair scratches with SW Wiping Stain, S64 series.
  5. Enameled Trim:
    - a. Apply one coat SW Premium Wall & Wood Primer, B28W8111.
    - b. Second coat will be as directed by the Architect.
  6. Hollow Metal Trim (Existing)
    - a. Same as enamel trim.

### **3.05 PROTECTION**

- A. Protect finished coatings from damage until completion of project.
- B. Touch-up damaged coatings after substantial completion, following manufacturer's recommendation for touch up or repair of damaged coatings. Repair any defects that will hinder the performance of the coatings.

## **PART 4 - SCHEDULES**

### **4.01 GENERAL**

- A. The Painting Schedule of this Section is based, in general, on products of Sherwin-Williams Company (noted SW on the schedule).
- B. Where painting occurs in addition or renovation projects provide low odor finishes equal to Sherwin Williams ProMar 200 Zero VOC Series.
- C. The various surfaces and areas receiving finishes maybe indicated on the drawings or as noted below. The desired finishes are shown by code numbers. Not all codes listed below may be used. The required materials for each code number shown on the finish schedule are specified below under the corresponding code numbers.

### **4.02 PAINTING SCHEDULE**

- A. Code 100a - Exterior Metal
  1. Including flashing, vents, doors, window trim and grilles.
  2. 1st Coat: SW ProCryl Universal Metal Primer, B66-1300 series.
  3. 2nd/3rd Coat: SW Pro Industrial WB Alkyd Urethane Enamel Gloss, B53-1050 series.
- B. Code 100b - Exterior Metal
  1. Including aluminum and galvanized metals
  2. 1st/2nd Coat: SW ProCryl Universal Metal Primer, B66-310 series.
  3. 3rd/4th Coat: SW Pro Industrial Acrylic Semi-Gloss, B66-650 series.
- C. Code 100c - Exterior Metal
  1. For use on exterior painted handrails and exposed structural steel over properly prepared steel (SSPC SP-6 Commercial Metal Blast, 2-3 mil profile).
  2. 1st Coat: SW Macropoxy 646 FC Epoxy B58 series

- 3. 2nd/3rd Coat: Sher-Loxane 800 B80 series
- D. Code 101 - Exterior Wood
  - 1. Including wood doors, screens and trim
  - 2. 1st Coat: SW Exterior Oil-Based Wood Primer, Y24W8020.
  - 3. 2nd/3rd Coat: A-100 Exterior Acrylic Satin, A82-series.
- E. Code 102a - Exterior CMU
  - 1. 1st Coat: SW PrepRite Block Filler, B25W25.
  - 2. 2nd/3rd Coat: SW A-100 Exterior Acrylic Satin, A82-series
- F. Code 102b - Exterior Cement Board
  - 1. 1st Coat: SW Loxon Concrete & Masonry Primer, LX2W50.
  - 2. 2nd/3rd Coat: SW A-100 Exterior Acrylic Satin, A82-series.
- G. Code 103 - Interior Wood (Natural Wood)
  - 1. 1st Coat: Minwax Performance Fast-Dry Sanding Sealer, 81580.
  - 2. 2nd/3rd Coat: Minwax Performance Series Fast-Dry Varnish 9150/9151 Series.
- H. Code 104a - Interior Wood (Painted Surface, Enamel):
  - 1. 1st Coat: SW Premium Wall & Wood Primer, B28W8111.
  - 2. 2nd/3rd Coat: SW Solo 100% Acrylic Semi-Gloss, A76 series.
- I. Code 104b - Interior Metal (Painted Surface, Enamel)
  - 1. 1st Coat: ProCryl Universal Metal Primer, B66-1300 series.
  - 2. 2nd/3rd Coat: Pro Industrial WB Alkyd Urethane Enamel Semi-Gloss, B53-1150 series.
- J. Code 105 - Interior Wood (Stain & Finish)
  - 1. 1st Coat: SW Sher-Wood Wiping Stain, S64 series. (color as selected by Architect)
  - 2. 2nd Coat: SW Pro Mar B44FT4 Lacquer Sanding Sealer
  - 3. 3rd Coat: SW Pro Mar B44FT7 Satin Lacquer
- K. Code 106 - Interior Masonry (Admin Areas)
  - 1. 1st Coat: SW Loxon Concrete & Masonry Primer, LX2W50.
  - 2. 2nd/3rd Coat: SW ProMar 200 Zero VOC Latex Eg-Shel, B20-2600 series.
- L. Code 107 - Interior Masonry (Corridors and Student Areas)
  - 1. 1st Coat: SW Loxon Concrete & Masonry Primer, LX2W50.
  - 2. 2nd/3rd Coat: SW Pro Mar 200 Zero VOC Latex Semi-gloss, B31-2600 series.
- M. Code 107a - Interior Masonry (Sound Rated Partitions)
  - 1. 1st/2nd Coat: SW Loxon Concrete & Masonry Primer, LX2W50.
  - 2. 3rd/4th Coat: SW Pro Mar 200 Zero VOC Latex Semi-gloss, B31-2600 series.
- N. Code 108 - Interior Metal, Natatoriums (Painted Surface, Enamel)
  - 1. Surface Preparation: SSPC-SP 6/NACE 3.
  - 2. 1st Coat: SW, Series, B65G10, Corothane I Galvapak 2K Zinc Primer, DFT 3.0-4.0 mils
  - 3. 2nd Coat: SW, Series B58-600, Macropoxy 646 Fast Cure Epoxy, DFT 5.0-10.0 mils
  - 4. 3rd Coat: SW, Sher-Loxane 800, Two Component Polysiloxane, DFT 4.0-6.0 mils.
  - 5. Total DFT 12-20 mils.
- O. Code 109 - Floors (Two Component Epoxy Coating)
  - 1. 1st Coat: SW ArmorSeal 33 Epoxy Primer/Sealer, B58 series.
  - 2. 2nd/3rd Coat: SW ArmorSeal 1000 HS, B67-2000 series
  - 3. At locker rooms and wet or damp areas provide anti-slip agent equal to one of the following:
    - a. H&C Concrete Products, Sharkgrip Slip Resistant Additive
    - b. QC Construction products, QC Sure Trac
- P. Code 110a - Two Component Epoxy Coating for CMU Walls (All Foodservice Areas)



1. 1st Coat: SW Pro Industrial Heavy Duty Block Filler, B42W150. This material is to be applied at the rate of 75sq. ft. per gallon or until surface is filled free from any voids or holes. Surface is to be filled free from excess mortar and cracks.
  2. 2nd/3rd Coat: SW Pro Industrial Water Based Catalyzed Epoxy, B73-300 Series.
- Q. Code 110b - Two Component Epoxy Coating for Gyp Board Walls (All Foodservice Areas)
1. 1st Coat: SW ProMar 200 Zero VOC Interior Latex Primer, B28W2600.
  2. 2nd/3rd Coat: SW Pro Industrial Water Based Catalyzed Epoxy, B73-300 Series.
- R. Code 110c - Epoxy for CMU Walls at "Wet/Shower" Areas, Restrooms, Vehicle Wash Bays, Natatoriums, Janitor, & Mechanical Rooms
1. 1st Coat: SW Kem Cati-Coat HS Epoxy Filler/Sealer, B42W400.
  2. 2nd/3rd Coat: SW Water Based Epoxy B70 Series/B60V15 Hardener.
- S. Code 110d - Epoxy for Gyp Board Walls at "Wet/Shower" Areas, Restrooms, Vehicle Wash Bays, Natatoriums, Janitor, & Mechanical Rooms
1. 1st Coat: SW ProMar 200 Zero VOC Interior Latex Primer, B28W2600.
  2. 2nd/3rd Coat: SW Pro Industrial Water Based Catalyzed Epoxy, B73-300 Series.
- T. Code 114 - Green Screen Paint
1. 1st Coat: SW ProMar 200 Zero VOC Interior Latex Primer, B28W2600.
  2. 2nd/3rd Coat: Water Based Acrylic Chroma Key Matte Green Video Paint.
- U. Code 115a - Interior Drywall (Admin Area Walls and Ceilings/Bulkheads)
1. 1st Coat: SW ProMar 200 Zero VOC Interior Latex Primer, B28W2600.
  2. 2nd/3rd Coat: SW Pro Mar 200 Zero VOC Latex Eg-Shel, B20-2600 series.
- V. Code 115b - Interior Plaster (Standard Ceilings/Bulkheads)
1. 1st Coat: SW ProMar 200 Zero VOC Interior Latex Primer, B28W2600.
  2. 2nd/3rd Coat: SW Pro Mar 200 Zero VOC Latex Eg-Shel, B20-2600 series.
- W. Code 116a - Interior Drywall (Walls in Corridors and Student Areas)
1. 1st Coat: SW ProMar 200 Zero VOC Interior Latex Primer, B28W2600.
  2. 2nd/3rd Coat: SW Pro Mar 200 Zero VOC Latex Eg-Shel, B20-2600 series.
- X. Code 116b - Interior Plaster (High Humidity Ceilings)
1. 1st Coat: SW ProMar 200 Zero VOC Interior Latex Primer, B28W2600.
  2. 2nd/3rd Coat: SW Pre-Catalyzed Waterbased Epoxy Semi-Gloss, K46-150 series.
- Y. Code 117 - Exterior Masonry Surfaces
1. 1st Coat: SW Loxon Concrete & Masonry Primer, LX2W50.
  2. 2nd/3rd Coat: SW ConFlex XL Elastomeric Smooth, CF11W51Series.
- Z. Code 118 - Interior Non-Textured Drywall (where painted or applied graphics occur)
1. 1st Coat: SW ProMar 200 Zero VOC Interior Latex Primer, B28W2600.
  2. 2nd/3rd Coat: SW Cashmere Interior Acrylic Latex DP-D17W00151.
- AA. Code 119 - Existing Metal - Electrostatic Enamel
1. Description: A single component modified acrylic enamel for use with electrostatic spray equipment.
  2. Surface Preparation: Surface must be clean and free of oils, grease, loose paint, rust, polish, waxes and moisture. Sand and remove all ropes and runs on existing metal. Surface must have feathering around scratches. Test surface for priming and adhesion to determine if a base coat should be removed and primed.
  3. 1st/2nd Coat: Electrostatic Enamel Semi-Gloss (182 Line - Sumter Coatings, Inc. Sumter, SC)
  4. Primer: As recommended by manufacturer for existing application.
  5. Applicators
    - a. Electro-Static Refinishers Inc., Dallas, TX; 972-296-2173
    - b. ElectroCoat, Houston, TX; 800-508-9449

- BB. Code 120 - Exposed Structural Steel, Joist and Deck in Crawl Space
1. Surface Preparation: SSPC SP-6 Commercial Metal Blast, 2-3 mil profile.
  2. 1st Coat: SW, Zinc Clad 4100 applied at 3-5 mils dry film thickness.
- CC. Code 121 - Ceilings (Exposed Structural Steel and Deck)
1. Touch-up factory prime coat on ferrous steel with SW ProCryl Universal Metal Primer, B66-1300 series.
  2. 1st /2nd Coat: SW APro Industrial Waterborne Acrylic DryFall Flat, B42W181.
- DD. Code 122 - Not Used
- EE. Code 123 - Concrete Floor Sealer:
1. Properly clean surface as per manufacturer's recommendations.
  2. 1st/2nd Coat: BASF MasterKure CC 250 SB (Formerly Kure-N-Seal)
  3. At locker rooms and wet or damp areas provide anti-slip agent equal to one of the following:
    - a. H&C Concrete Products, Sharkgrip Slip Resistant Additive
    - b. QC Construction products, QC Sure Trac
- FF. Code 124 - Structural & Miscellaneous Steel, Steel Bar Joists
1. 1st Coat: SW Opti-Bond (B50W100).

**END OF SECTION**

**SECTION 10 1100  
VISUAL DISPLAY UNITS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Markerboards
- B. Tackboards

**1.02 RELATED REQUIREMENTS**

- A. Section 05 4000 - Cold-Formed Metal Framing.
- B. Section 06 1000 - Rough Carpentry: Blocking and supports.

**1.03 REFERENCE STANDARDS**

- A. ANSI A135.4 - Basic Hardboard 2012 (Reaffirmed 2020).
- B. ASTM A424/A424M - Standard Specification for Steel, Sheet, for Porcelain Enameling 2018.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data on markerboard, tackboard, tackboard surface covering, trim, and accessories.
- C. Shop Drawings: Indicate wall elevations, dimensions, joint locations , special anchor details.
- D. Manufacturer's printed installation instructions.
- E. Maintenance Data: Include data on regular cleaning, stain removal .

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.

**1.06 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide 50-Year warranty for markerboard to include warranty against discoloration due to cleaning, crazing or cracking, and staining.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. American Visual Display Products: [www.americanvisualdisplay.com](http://www.americanvisualdisplay.com).
- B. ASI Visual Display Products: [www.asi-visualdisplayproducts.com](http://www.asi-visualdisplayproducts.com).
- C. Claridge Products and Equipment, Inc: [www.claridgeproducts.com/#sle](http://www.claridgeproducts.com/#sle).
- D. MooreCo, Inc: [www.moorecoinc.com/#sle](http://www.moorecoinc.com/#sle).
- E. Nelson Adams NACO: [www.nelsonadamsnaco.com/#sle](http://www.nelsonadamsnaco.com/#sle).
- F. Polyvision Corporation: [www.polyvision.com/#sle](http://www.polyvision.com/#sle).
- G. Substitutions: See Section 01 6000 - Product Requirements.

**2.02 VISUAL DISPLAY UNITS**

- A. Markerboards: Porcelain enamel on steel, laminated to core.
  - 1. Basis of Design: Claridge LCS3 Series 1.
  - 2. Color: Low Gloss, White.
  - 3. Steel Face Sheet Thickness: 24 gage, 0.0239 inch .
  - 4. Core: MDF, 7/16 inch thick, laminated to face sheet.
  - 5. Backing: Steel back, laminated to core.
  - 6. Size: As indicated on drawings.

7. Frame: Extruded aluminum , with concealed fasteners.
  8. Frame Finish: Anodized, natural.
  9. Markerboard Finish: Markerboard surface shall be consistent in appearance without fading or ghosting.
  10. Accessories: Provide marker tray, chalk tray, map rail, flag holder, and metal display hooks at 2'-0" o.c. on map rail. Each board shall have minimum 4 spring clip hangers, 2 flag holders and 2 roller brackets per classroom
  11. Omit marker tray in all "Activity Rooms", "Exterior Applications" and "Gymnasiums."
- B. Tackboards: Fine-grained, homogeneous natural cork.
1. Acceptable Product: Claridge, Claridge Cork
  2. Cork Thickness: 1/4 inch.
  3. Color: As selected from manufacturer's full range.
  4. Backing: Hardboard, 1/4 inch thick, laminated to tack surface.
  5. Size: As indicated on drawings.
  6. Frame: Extruded aluminum , with concealed fasteners.
  7. Frame Finish: Anodized, natural.
- C. Combination Units and Units Made of More Than One Panel: Factory-assembled markerboards and tackboards in a single frame, of materials specified above.
1. Join panels of different construction with H-shaped extruded aluminum molding finished to match frame.
  2. Join panels of similar construction with butt joints, aligned and secured with steel spline concealed in edge of core.
  3. Configuration: As indicated on drawings.

## **2.03 MATERIALS**

- A. Porcelain Enameled Steel Sheet: ASTM A424/A424M, Type I, Commercial Steel, with fired-on vitreous finish.
- B. Hardboard for Cores: ANSI A135.4, Class 1 - Tempered, S2S (smooth two sides).
- C. Medium Density Fiberboard (MDF): ANSI A208.2; composed of wood fibers pressure bonded with manufacturer's recommended adhesive to suit application.
- D. Steel Sheet Backing: 28 gage, 0.0149 inch, galvanized.
- E. Adhesives: Type used by manufacturer.

## **2.04 ACCESSORIES**

- A. Map Rail: Extruded aluminum, manufacturer's standard profile, with cork insert and runners for accessories; 1 inch wide overall , full width of frame.
- B. Map Supports: Formed aluminum sliding hooks to fit map rail.
- C. (2) Flag Holders: Cast aluminum bored to receive 1 inch diameter flag staff, bracketed to fit top rail of board. Omit marker tray in all "Activity Rooms", "Corridors" "Exterior Applications" and "Gymnasiums."
- D. Marker Tray: Aluminum, manufacturer's standard profile, one piece full length of markerboard, molded ends, concealed fasteners, same finish as frame.
- E. Mounting Brackets: Concealed.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated on shop drawings.
- B. Verify that internal wall blocking is ready to receive work and positioning dimensions are as instructed by the manufacturer.

### **3.02 PREPARATION**

- A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### **3.03 INSTALLATION**

- A. Install the work of this Section in strict accordance with the original design, the approved Shop Drawings, and the manufacturer's recommended installation procedures as approved by the Architect, anchoring all components firmly into position for long life under hard use, this includes wall anchors at 2'-0" o.c. and wall adhesive at maximum of 16" o.c.e.w.
- B. Install with top of the marker tray at 15-48 inches above finished floor. Verify actual height with Owner before installation as required to accommodate writing, projection and viewing surface.
- C. Secure units level and plumb.
- D. Butt Joints: Install with tight hairline joints.

### **3.04 CLEANING**

- A. Clean board surfaces in accordance with manufacturer's instructions.
- B. Cover with protective cover, taped to frame.
- C. Remove temporary protective cover at Date of Substantial Completion.

**END OF SECTION**



**SECTION 10 1400  
SIGNAGE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Room and door signs.
- B. Building, Wayfinding and Title Signs.
- C. Plaque.
- D. Double-Sided Electronic Message Sign.

**1.02 REFERENCE STANDARDS**

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines current edition.
- B. ADA Standards - 2010 ADA Standards for Accessible Design 2010.
- C. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.

**1.03 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.
- C. Shop Drawings:
  - 1. Submit shop drawings showing each typical room and door sign type for fabrication, including typical drawings and details for each type to be provided.
  - 2. Submit shop drawings showing all graphic, wayfinding or other "special" signage for fabrication, including drawings and details for each to be provided.
  - 3. Shop drawings shall include plan location, directional information, size, font, color, mounting details, and scaled representation of configuration for each sign (included, but not limited to, building signs, directional/ wayfinding signs, and plaques) and graphic elements.
- D. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
  - 1. When room numbers to appear on signs differ from those on drawings, include the drawing room number on schedule.
  - 2. Request content of signs from Owner through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
  - 3. Submit for approval by Owner through Architect prior to fabrication.
- E. Building signage, including, but not limited to, directional/ wayfinding signs, plaques, graphic elements and marquee signs:
  - 1. ALL signage shall be submitted for approval by the Owner for content, color, size and other physical qualities.
  - 2. ALL signage shall not be fabricated or installed without the written approval of the Owner.
- F. Samples: Submit two samples of each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.
- G. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.
- H. Verification Samples: Submit samples showing colors specified.
- I. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

#### **1.04 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.

#### **1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with requirements of Section 01 6000 - Product Requirements.
- B. Package signs as required to prevent damage before installation.
- C. Package room and door signs in sequential order of installation, labeled by floor or building.
- D. Store tape adhesive at normal room temperature.

#### **1.06 FIELD CONDITIONS**

- A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
- B. Maintain this minimum temperature during and after installation of signs.

#### **1.07 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a one year period after Date of Substantial Completion.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Room and Door Signs:
  - 1. Apco Architectural Signs: [www.apco.com](http://www.apco.com)
  - 2. ASI Signage: [www.asisignage.com](http://www.asisignage.com).
  - 3. Benchmark Signs: [www.benchmarksigns.biz](http://www.benchmarksigns.biz).
  - 4. Best Sign Systems, Inc.: [www.bestsigns.com](http://www.bestsigns.com).
  - 5. Bayuk Graphic Systems, Inc.: [www.bayukgraphics.com](http://www.bayukgraphics.com).
  - 6. Cosco Industries: [www.coscoarchitecturalsigns.com](http://www.coscoarchitecturalsigns.com).
  - 7. FASTSIGNS: [www.fastsigns.com](http://www.fastsigns.com).
  - 8. Inpro: [www.inprocorp.com](http://www.inprocorp.com).
  - 9. Kroy Sign Systems: [www.kroysignsystems.com](http://www.kroysignsystems.com).
  - 10. Mohawk Sign Systems, Inc.: [www.mohawksign.com](http://www.mohawksign.com).
  - 11. South Texas Graphic Specialties, Inc.: [www.stxgraphics.com](http://www.stxgraphics.com).
  - 12. Substitutions: See Section 01 6000 - Product Requirements.
- B. Building, Wayfinding and Title Signs:
  - 1. Cosco Industries: [www.coscoarchitecturalsigns.com](http://www.coscoarchitecturalsigns.com).
  - 2. FASTSIGNS: [www.fastsigns.com](http://www.fastsigns.com).
  - 3. Inpro: [www.inprocorp.com](http://www.inprocorp.com).
  - 4. A.R.K. Ramos Signage Systems: [www.arkramos.com](http://www.arkramos.com).
  - 5. ASI Signage: [www.asisignage.com](http://www.asisignage.com).
  - 6. Best Sign Systems, Inc.: [www.bestsigns.com](http://www.bestsigns.com)
  - 7. Gemini Inc.: [www.geminisignproducts.com](http://www.geminisignproducts.com)
  - 8. The Southwell Company: [www.southwellco.com](http://www.southwellco.com).
  - 9. Substitutions: See Section 01 6000 - Product Requirements.
- C. Double-Sided Electronic Message Sign.
  - 1. Daktronics, Inc.: [www.daktronics.com](http://www.daktronics.com).
  - 2. The Spectrum Corporation: [www.spectrumscoreboards.com](http://www.spectrumscoreboards.com).
  - 3. Substitutions: See Section 01 6000 - Product Requirements.
- D. Plaques:
  - 1. Cosco Industries: [www.coscoarchitecturalsigns.com](http://www.coscoarchitecturalsigns.com).
  - 2. Impact Signs: [www.impactsigns.com](http://www.impactsigns.com)



3. The Southwell Company: [www.southwellco.com](http://www.southwellco.com).
4. Substitutions: See Section 01 6000 - Product Requirements.

## **2.02 SIGNAGE APPLICATIONS**

- A. Accessibility Compliance: Signs are required to comply with ADA Standards, TAS, ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.
- B. Room and Door Signs: Provide a sign for every doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas. See drawings for sign types and other requirements.
  1. Basis of Design: Apco Architectural Signs; Elevate Series 1
  2. General:
    - a. Sign system shall be frameless and shall feature solutions for all required sign types, including but not limited to wall mounted personnel signs, work station personnel signs, primary room identification, directories, directionals, overhead signs, projection wall signs, restroom signs, regulatory and information signs, stair signs and changeable slide conference room signs. All signs within the system must convey a uniform look throughout.
    - b. See Schedule of Materials and Colors for additional information.
  3. Features:
    - a. Sign Assembly:
      - 1) Sign shall feature a fully recessed chassis to which modular display panels securely engage, creating a frameless look with the appearance that display panels are floating off of the mounting surface.
    - b. Display Panels / Inserts:
      - 1) Primary display panels shall be 1/8" thick painted acrylic plaques or 1/8" thick satin anodized aluminum plaques with direct-print graphics. Optional display panels shall be 3mm(1/8") aluminum composite plaques with the .012" aluminum skin formed precisely around all four edges of the panel to conceal the panel's composite core. Display panels engage with the concealed chassis in a precise manner to ensure a 1/16" reveal between all panels as a standard. An optional No-Reveal solution enables all panels to butt directly against one another with no inter-insert reveals.
    - c. Full Bleed Graphics:
      - 1) System shall offer options for direct-print graphics that bleed around all four edges/returns of the display panels.
    - d. Tamper Resistance:
      - 1) System must offer an option for a concealed locking method to increase level of tamper resistance.
    - e. Mounting:
      - 1) Signs must be able to accommodate installation via fully concealed mechanical fasteners.
    - f. Modularity:
      - 1) All display panels shall be securely engaged within a concealed chassis but must be easily updatable to accommodate change. Display panels must be removable without the use of a special, proprietary tool.
    - g. User Letter Paper Inserts:
      - 1) System must offer solutions for user updatable paper inserts, including a range of perforated, coated paper and free software with templates for easy creation of graphics.
  4. Materials and Construction:

- a. Sign shall feature a fully recessed black anodized aluminum chassis to which modular display panels securely engage. Chassis shall be no more than 3/8" in depth and shall be recessed sufficiently behind the panels to give the appearance the panels/inserts are floating off of the mounting surface.
    - b. Primary display panels shall be 1/8" thick painted acrylic or 1/8" satin anodized aluminum with direct-print graphics. Optional display panels for full-bleed graphics shall be 3mm (1/8") thick aluminum composite (ACM) with the .012" aluminum face formed precisely around all four edges of the panel to conceal its composite core. Display panels must securely engage with the recessed chassis via a concealed attachment method but should be 100% modular to accommodate changes.
    - c. System shall offer a range of aluminum bands to house user-updatable, perforated paper inserts. Inserts shall be retained on the left and right sides of the aluminum band by .020" clear, flexible end caps.
    - d. Standard ADA inserts/plaques are acrylic or aluminum with APCO's DP-Tactile process direct-print, UV-cured 1/32" thick tactile characters and fully domed Braille.
    - e. Standard graphics are UV-cured, direct-print with true 600dpi resolution and the option to bleed around all four edges/returns of the ACM display panels.
    - f. Attachment: Signs shall be able to accommodate fully concealed mechanical fasteners.
  5. All letters, numbers and/or symbols shall contrast with their background. Characters and background shall have a non-glare finish.
  6. Background color as selected by architect from manufacturer's actual color samples.
  7. Letterform shall be Helvetica Regular upper case letters and numbers.
  8. Size of letters and numbers shall be as follows:
    - a. Owners Room numbers shall be 1".
    - b. Lettering for room ID signs shall be 3/4" or as noted.
    - c. Provide construction floor plan room number in lower right hand corner on all signs. Number shall be 3/8" high and color shall match background.
    - d. Symbol size shall be 4".
    - e. Standard Grade 2 braille shall be 1/2" below copy.
    - f. Corners: Square edges.
  9. Provide solid cover plate for back side of sign where mounted to glass.
  10. Entry/Exit Numbering: Provide 4" high door number on each side of all exterior doors for First Responder information. Numbers shall start at main primary entry and continue sequence in clockwise direction around the building.
  11. Exterior Room Identification Signage
    - a. Provide cast aluminum sign with raised letters and border.
    - b. Raised letters and border shall be satin finish with painted background.
    - c. Signs shall have room function followed by Grade 2 Braille directly below.
    - d. Provide at all exterior mechanical, electrical, fire riser rooms or other exterior locations.
- C. Code Required Signage: Fire Protection and Utility Equipment Identification Access and Emergency Signage. See "Schedules" article below.
- D. Building, Wayfinding and Title Signs:
1. Building Letters.
    - a. Use individual cast aluminum alloy, smooth surface letters.
    - b. Letters shall be Times New Roman for bidding purposes unless noted otherwise on the drawings.
    - c. Finish shall be baked enamel, primed and spray coated with two (2) coats of baked enamel.
    - d. Reference drawings for font heights and locations.

- e. Font and finish are for bidding purposes only. Submit samples to Architect for approval before fabrication of any material
  - f. Provide (5) 8" high numbers for the building address. Verify location with Building Inspector. Color shall be contrasting to building. Provide one set per building.
  - 2. Custom Reverse Channel, Backlit Fabricated Letters:
    - a. Lighting: Provide lighting system equal to Soft-Glo lighting system by A.R.K. Ramos Signage Systems.
    - b. Letter Characteristics
      - 1) Metal: Aluminum
      - 2) Thickness: Letter depth = 1"
      - 3) Letterstyle: Fabricated Aluminum Letter. Letters shall be Times New Roman for bidding purposes. Verify actual font with Owner prior to fabrication.
      - 4) Finish: As selected from manufacturer's full range.
      - 5) Mounting: PM-1
      - 6) Reference drawings for font heights and locations.
  - 3. Custom Graphic Signs:
    - a. Laser cut acrylic letters/graphics where shown on the drawings
      - 1) 1/2" impact-modified acrylic sheet.
      - 2) Letters shall be laser cut with slight radius on all inside corners to prevent cracking.
  - 4. Fabricated Box Letters: Laser cut using computer-guided equipment.
    - a. Material: Aluminum
    - b. Letter Height and Depth: Reference drawings.
    - c. Letter Construction: Fabricated Aluminum faces are produced with .090" aluminum. Returns are produced with .063" aluminum.
    - d. Letterstyle: Fabricated Aluminum Letter. Letters shall be Helvetica for bidding purposes. Reference drawings and verify actual font with Owner prior to fabrication.
    - e. Finish: Powder coated aluminum as selected from manufacturer's full range.
    - f. Mounting: Bottom Stud Mount. Letters shall be vertically cantilevered off of their support. Angled "tie-backs" are not acceptable.
  - 5. Custom Vinyl Graphics
    - a. Laser cut vinyl letters/graphics where shown on the drawings
      - 1) Multi Die Cut production and Single Die Cut production. Adhesive backing adhered to walls and glass.
      - 2) Provide address in 6" vinyl letters on glass above front entrance door. Coordinate with Owner and AHJ.
    - b. Mount on wall in location shown on drawings.
  - 6. All exterior wall, roof, and structure mounted letters/signs to be engineered by the sign manufacturer for mounting requirements and structural connections in accordance with the applicable wind loading and building codes. Sign manufacturer shall coordinate with adjacent building trades for connection requirements prior to other building elements being installed.
- E. Plaques:
- 1. Provide 1 aluminum plaque with the following attributes:
    - a. Design shall be as detailed in this section.
    - b. Tablet to be 18" x 18". Letter style as shown.
    - c. The plaque shall be cast of virgin ingots, (F124 aluminum alloy). Casting shall be free of all pits and gas holes, and all letters shall be sharp and hand tooled.
    - d. Border and faces of raised letters are to be satin finish, and background is to be stippled finish.
    - e. Background shall be sprayed with medium gray acrylic lacquer. Plaque shall be chemically cleaned and etched and treated with alodine. Two coats of clear acrylic lacquer shall be sprayed on completed plaque.

- f. The plaque shall contain the names of the Superintendent of Schools, School Board members, the Architect, the Contractor, the Year and Title of the Building. Names will be furnished at a later date. If the size specified is not large enough to accommodate all the information given above, the plaque size shall be increased accordingly.
- 2. Mount the plaque where directed by the Architect.
- F. Double-Sided Electronic Message Sign:
  - 1. Basis of Design: Daktronics, Galaxy GS6 Series two-sided electronic message sign with electronic control software. See drawings for configurations and dimensions.
  - 2. Display Capabilities:
    - a. The display shall contain a full LED matrix.
    - b. The LED display shall be capable of producing 281 trillion colors for RGB at all dimming levels.
    - c. The display shall be able to display messages composed of any combination of alphanumeric text, punctuation symbols, graphic images, and pre-canned video files.
  - 3. Communication:
    - a. Ethernet Cellular Modem.
  - 4. Control Software:
    - a. Display content and scheduling shall be via a cloud-based solution. Software to be web browser access and hosted on manufacturer's servers at no cost to the Owner.

## **2.03 ACCESSORIES**

- A. Countersunk Screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.
- B. Tape Adhesive: Double sided tape and clear silicone adhesive.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that substrate surfaces are ready to receive work.
  - 1. Examine work area with installer present.
  - 2. If existing conditions are not as required to properly complete the work of this section, notify Architect.
  - 3. Do not proceed with installation until deficiencies in existing conditions have been corrected.
- B. Verify that dimensions, tolerances, and attachment methods for work in this section are properly coordinated with other work on site.

### **3.02 INSTALLATION**

- A. Interior/Exterior Room and Door Signage
  - 1. Install in accordance with manufacturer's instructions.
  - 2. Install neatly, with horizontal edges level.
  - 3. Locate signs where indicated:
    - a. Room and Door Signs: Contractor shall locate specific mounting heights in coordination with the 2012 TAS regulations. Mount sign on wall or glass.
    - b. If no location is indicated obtain Owner's instructions.
    - c. Wall or Glass Mounted: Double sided vinyl tape and clear silicone adhesive. Provide solid cover plate for back side of sign for glass installations.
    - d. Wall Mounted Directly to Masonry: Screw mount with four corner countersunk screws evenly spaced from each corner. Screw color to match sign color.
  - 4. Protect from damage until Date of Substantial Completion; repair or replace damaged items.
- B. Building Identification Signage

1. General: locate sign units and accessories where indicated, using mounting methods of the type described and in compliance with the manufacturer's instructions.
  2. Install signs level, plumb, and at the height indicated with sign surfaces free from distortion or other defects in appearance.
  3. Cleaning and Protection: After installation, clean soiled sign surfaces according to the manufacturer's instructions. Protect units from damage until acceptance by the owner.
- C. Electronic Message Sign
1. Comply with provisions of Section 01 7000 - Execution and Closeout Requirements
  2. Install sign in accordance with manufacturer's instructions.
  3. Set support post plumb to ¼ inch in 10 feet. Fill hole with 3000 psi concrete to 2 inches above grade and extend concrete a minimum of 2 inches below bottom of post. Slope surface of exposed concrete to slope away from post.

### 3.03 SCHEDULES

- A. Interior/Exterior Room and Door Signage:
1. Type B - ID signs with room number and function.
    - a. Locations – All locations except classrooms, offices.
    - b. Provide "Roof Access" sign to rooms housing roof access hatch and ladder
    - c. Provide "Maximum Occupancy" signs at the following locations;
      - 1) Lecture Hall
      - 2) Cafeteria
      - 3) Auditorium
      - 4) Gymnasium
      - 5) Activity Room
    - d. Provide "Exterior Room Identification Signage" at all exterior mechanical, electrical and fire riser rooms.
- B. Code Required Signage.
1. Fire Protection Equipment Identification, exterior access.
    - a. Location(s): Permanently installed and readily visible. Verify mounting location with AHJ.
      - 1) Fire Suppression Sprinkler Riser and Valve Rooms.
    - b. Copy: "RISER ROOM".
    - c. Color: Copy to be White in contrast to its Red background.
  2. Fire Protection and Utility Equipment Identification, interior access.
    - a. Location(s): Verify mounting location with AHJ.
      - 1) Air-Conditioning Systems Control Rooms.
      - 2) Fire Suppression Sprinkler Riser and Valve Rooms.
      - 3) Fire Detection, Suppression or Control.
    - b. Copy: For bidding purposes, use room name as indicated on drawings. Verify final copy with Architect prior to fabrication.
    - c. Color: Copy to be in contrast to its background.
  3. Elevator Lobby Emergency Signs: Provide one standardized design posted adjacent to each elevator call station on all floors. Copy: "IN CASE OF FIRE, ELEVATORS ARE OUT OF SERVICE. USE EXIT STAIRS".
  4. Provide engraved plate with a sequential number (beginning with 1) for each exterior door, located on door frame. Provide a laminated map of these door numbers next to main FACP panel. Coordinate with AHJ.
- C. **Plaque Example:**

**TOMBALL WEST HIGH SCHOOL**  
**TOMBALL INDEPENDENT SCHOOL DISTRICT**  
**2026**

**20XX - 20XX BOARD OF TRUSTEES**

Name Here	President
Name Here	Vice President
Name Here	Secretary
Name Here	Assistant Secretary
Name Here	Trustee
Name Here	Trustee
Name Here	Trustee

**ADMINISTRATION**

Name Here	Super Intendent
Name Here	Cheif Financial Officier
Name Here	Secretary
Name Here	Assistant Secretary
Name Here	Trustee

ARCHITECT - Huckabee  
PROGRAM MANAGER - Lockwood, Andrews & Newnam, Inc.  
CONSTRUCTION MANAGER - Name Here, Inc.

**END OF SECTION**

**SECTION 10 2113.17**  
**PHENOLIC TOILET COMPARTMENTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Phenolic toilet compartments.
- B. Urinal screens.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 1000 - Rough Carpentry: Blocking and supports.
- B. Section 10 2800 - Toilet, Bath, and Laundry Accessories.

**1.03 REFERENCE STANDARDS**

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023b.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination: Coordinate the work with placement of support framing and anchors in walls and ceilings.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on panel construction, hardware, and accessories.
- C. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.
- D. Samples: Submit two samples of partition panels, 6 by 6 inch in size illustrating panel finish, color, and sheen.
- E. Manufacturer's Installation Instructions: Indicate special procedures.

**1.06 WARRANTY**

- A. Manufacturer's Warranty: Manufacturer's standard 25 year limited warranty for panels, doors, and stiles against breakage, corrosion, delamination, and defects in factory workmanship. Manufacturer's standard 1 year guarantee against defects in material and workmanship for stainless steel door hardware and mounting brackets

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Phenolic Toilet Compartments:
  - 1. Accurate Partitions Corp.: [www.accuratepartitions.com](http://www.accuratepartitions.com).
  - 2. Bobrick Washroom Equipment, Inc.: [www.bobrick.com](http://www.bobrick.com).
  - 3. General Partitions Mfg. Corp.: [www.generalpartitions.com](http://www.generalpartitions.com).
  - 4. Global Partitions Corp.: [www.globalpartitions.com](http://www.globalpartitions.com).
  - 5. Partition Systems International of South Carolina: [www.psisc.com](http://www.psisc.com).
  - 6. Substitutions: Section 01 6000 - Product Requirements.

**2.02 PHENOLIC TOILET COMPARTMENTS**

- A. Toilet Compartments: Factory fabricated doors, pilasters, and divider panels made of solid phenolic core panels with integral melamine finish, floor and ceiling anchored.
  - 1. Color: As selected from manufactures full line of colors.
- B. Doors:
  - 1. Thickness: 3/4 inch.
  - 2. Width: 28 inch.
  - 3. Width for Handicapped Use: 34 inch, out-swinging. (minimum)

4. Width for Ambulatory Use: 34 inch, out-swinging.
5. Height: 58 inch mounted 12" above finished floor.
- C. Panels:
  1. Thickness: 1/2 inch.
  2. Height: 58 inch mounted 12" above finished floor.
  3. Depth: As indicated on drawings.
- D. Pilasters:
  1. Thickness: 3/4 inch.
  2. Width: As required to fit space; minimum 3 inch.
- E. Screens: Without doors; to match compartments; mounted to wall with continuous panel brackets, braced with a continuous ceiling to floor stainless steel brace at front face of screen.
  1. Thickness: 1/2 inch.
  2. Height: 58 inch mounted 12" above finished floor.
  3. Depth: 22 inches.
- F. National Fire Protection Association/International Building Code Interior Wall and Ceiling Finish: Class B / Uniform Building Code: Class II.
  1. Flame Spread Index ASTM E84: 30 for panels and stiles.
  2. Smoke Developed Index ASTM E84: 55 for panels, 20 for stiles.

### **2.03 ACCESSORIES**

- A. Wall and Pilaster Brackets: Satin stainless steel; manufacturer's standard type for conditions indicated on drawings.
- B. Attachments, Screws, and Bolts: Stainless steel , tamper proof type.
  1. For attaching panels and pilasters to brackets: Through-bolts and nuts ; tamper proof.
- C. Hardware: Satin stainless steel:
  1. Continuous-type hinge, self closing.
  2. Door Latch: Slide type with exterior emergency access feature.
  3. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
  4. Coat hook with rubber bumper; one per compartment, mounted on door.
  5. Provide door pull for outswinging doors.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify correct spacing of and between plumbing fixtures.
- C. Verify correct location of built-in framing, anchorage, and bracing.

### **3.02 INSTALLATION**

- A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.
- B. Maintain 3/8 inch to 1/2 inch space between wall and panels and between wall and end pilasters.
- C. Attach panel brackets securely to walls using anchor devices.
- D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.
- E. Field touch-up of scratches or damaged finish will not be permitted. Replace damaged or scratched materials with new materials.

### **3.03 TOLERANCES**

- A. Maximum Variation From True Position: 1/4 inch.
- B. Maximum Variation From Plumb: 1/8 inch.



#### **3.04 ADJUSTING**

- A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.
- B. Adjust hinges to position doors in partial opening position when unlatched. Return out-swinging doors to closed position.
- C. Adjust adjacent components for consistency of line or plane.

**END OF SECTION**



**SECTION 10 2123  
CUBICLE CURTAINS AND TRACK**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Suspended overhead curtain track and guides.
- B. Surface mounted overhead curtain track and guides.
- C. Cubicle curtains.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 1000 - Summary: Owner-installed curtains.
- B. Section 05 5000 - Metal Fabrications: Track supports above ceiling.
- C. Section 06 1000 - Rough Carpentry: Blocking and supports for track.
- D. Section 09 5100 - Acoustical Ceilings: Suspended ceiling system to support track.

**1.03 REFERENCE STANDARDS**

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023b.
- B. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films 2023, with Errata.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for curtain fabric characteristics.
- C. Shop Drawings: Indicate a reflected ceiling plan view of curtain track, hangers and suspension points, attachment details, schedule of curtain sizes.
- D. Samples: Submit two fabric samples, 12 by 12 inch in size illustrating fabric color.
- E. Samples: Submit 12 by 12 inch sample patch of curtain cloth with representative top, bottom, and edge hem stitch detail, heading with reinforcement and carrier attachment to curtain header.
- F. Samples: Submit 12 inch sample length of curtain track including typical splice, wall and ceiling hanger, and escutcheon.
- G. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention .
- H. Maintenance Data: Include recommended cleaning methods and materials and stain removal methods.
- I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.
  - 2. Extra Curtains: One of each type and size.
  - 3. Extra Carriers: Five.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Accept curtain materials on site and inspect for damage.
- B. Store curtain materials on site and deliver to Owner for installation when requested.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Cubicle Track and Curtains:
  - 1. A. R. Nelson Co: [www.arnelson.com](http://www.arnelson.com).
  - 2. C/S General Cubicle: [www.c-sgroup.com/cubicle-track-curtains](http://www.c-sgroup.com/cubicle-track-curtains).

3. Imperial Fastener Co., Inc: [www.imperialfastener.com](http://www.imperialfastener.com).
4. Inpro: [www.inprocorp.com](http://www.inprocorp.com).
5. Substitutions: See Section 01 6000 - Product Requirements.

## **2.02 TRACKS AND TRACK COMPONENTS**

- A. Tracks: Extruded aluminum sections; one piece per track run.
  1. Profile: Channel.
  2. Mounting: Surface.
  3. Structural Performance: Capable of supporting vertical test load of 50 lbs without visible deflection of track or damage to supports, safely supporting moving loads, and sufficiently rigid to resist visible deflection and without permanent set.
  4. Track End Stop, Tees, Y's, and Switches: to fit track section. Provide one removable end closer per track to permit entry and removal of carriers.
  5. Track Bends: Minimum 12 inch radius; fabricated without deformation of track section or impeding movement of carriers.
  6. Suspension Rods: Tubular aluminum sections, sized to support design loads and designed to receive attachment from track and ceiling support.
  7. Escutcheons: Where suspension rod meets finished ceiling or structure, provide escutcheons to match rod finish.
  8. Finish on Exposed Surfaces: Clear anodized.
- B. Curtain Carriers: Nylon rollers, size and type compatible with track; designed to eliminate bind when curtain is pulled; fitted to curtain to prevent accidental curtain removal.
- C. Wand: Plastic, attached to lead carrier, for pull-to-close action.
- D. Installation Accessories: Types required for specified mounting method and substrate conditions.

## **2.03 CURTAINS**

- A. Cubicle Curtains:
  1. Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
  2. Inherently flame resistant or flameproofed; capable of passing NFPA 701 test.
  3. Material: Close weave polyester; anti-bacterial, self deodorizing, sanitized, and preshrunk.
- B. Curtain: Reference schedule of materials and colors for selected fabric; color as selected.
- C. Open Mesh Cloth: Open weave to permit air circulation; flameproof material, manufacturer's standard color.
- D. Curtain Fabrication:
  1. Width of curtain to be 10 percent wider than track length.
  2. Include open mesh cloth at top 20 inches of curtain for room air circulation, attached to curtain as specified above.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that surfaces and supports above ceiling are ready to receive work of this Section.
- B. Verify that field measurements are as indicated.

### **3.02 INSTALLATION**

- A. Install curtain track to be secure, rigid, and true to ceiling line.
- B. Suspend track from ceiling system. Provide above ceiling reinforcement for entire length of curtain.
- C. Install curtains on carriers ensuring smooth operation.

### **3.03 SCHEDULES**

- A. Provide at Nurses stations and where indicated on drawings.

**END OF SECTION**



**SECTION 10 2239  
FOLDING PANEL PARTITIONS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Top-supported folding panel partitions, horizontal opening.
- B. Ceiling track and operating hardware.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 1000 - Rough Carpentry: Wood blocking and track support shimming.
- B. Section 08 7100 - Door Hardware: Lock cylinders for panels

**1.03 REFERENCE STANDARDS**

- A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2021.
- B. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2021.
- C. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).
- D. ASTM E413 - Classification for Rating Sound Insulation 2022.
- E. ASTM E557 - Standard Guide for Architectural Design and Installation Practices for Sound Isolation Between Spaces Separated by Operable Partitions 2012 (Reapproved 2020).

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene at project site seven calendar days prior to scheduled beginning of construction activities of this section to review section requirements.
  - 1. Require attendance by representatives of installer.
  - 2. Notify Architect four calendar days in advance of scheduled meeting date.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on partition materials, operation, hardware and accessories, track switching components, and colors and finishes available.
- C. Shop Drawings: Indicate opening sizes, track layout, details of track and required supports, and stacking depth.
- D. Samples for Selection: Submit two samples of full manufacturer's color range for selection of colors.
- E. Samples for Review: Submit two samples of surface finish, 12 by 12 inches size, illustrating quality, colors selected, texture, and weight.
- F. Certificates: Certify that partition system meets or exceeds specified acoustic requirements.
- G. Manufacturer's Instructions: Indicate special procedures, perimeter conditions requiring special attention, and installation sequence.
- H. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods. Describe cleaning materials detrimental to finish surfaces and hardware finish.

**1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience and approved by manufacturer.

### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging until installation.

### **1.08 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within two year period after Date of Substantial Completion.
- C. Provide two year manufacturer warranty against defects in material and workmanship, excluding abuse.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Folding Panel Partitions - Horizontal Opening:
  - 1. Kwik-Wall Company: [www.kwik-wall.com/#sle](http://www.kwik-wall.com/#sle).
  - 2. Moderco, Inc: [www.moderco.com/#sle](http://www.moderco.com/#sle).
  - 3. Modernfold, a DORMA Group Company: [www.modernfold.com/#sle](http://www.modernfold.com/#sle).

### **2.02 FOLDING PANEL PARTITIONS - HORIZONTAL OPENING**

- A. Folding Panel Partitions: Side opening; individual panels; side stacking; manually operated.
- B. Panel Construction:
  - 1. Frame: 16 gauge, 0.0598 inch thick formed sheet steel frame top, bottom, jambs, and intermediates; welded construction.
  - 2. Substrate: Gypsum board.
  - 3. Panel Substrate Facing: Steel sheet, manufacturer's standard thickness.
  - 4. Hardware: Latching door handles of material, and finish to match remainder of project; lock cylinder keyed to building keying system.
    - a. Refer to Section 08 7100 for additional requirements.
    - b. Provide pass door with panic hardware where required per code - minimum 1 required.
  - 5. Panel Properties:
    - a. Thickness With Finish: 4 inches max.
    - b. Width: Standard width.
    - c. Weight: 5-11 lb/sq ft. based on STC rating.
- C. Panel Finishes:
  - 1. Facing: Markerboard.
  - 2. Exposed Metal Trim: As scheduled in Section 01 6210.
- D. Panel Seals:
  - 1. Panel to Panel Seals: Grooved and gasketed astragals, with continuous flexible ribbed vinyl seal fitted to panel edge construction; color to match panel finish.
  - 2. Acoustic Seals: Flexible acoustic seals at jambs, meeting mullions, ceilings, retractable floor and ceiling seals, and above track to structure acoustic seal.
- E. Suspension System:
  - 1. Track: Formed steel; Minimum 1-1/4 by 1-1/4 inch size; thickness and profile designed to support loads, steel sub-channel and track connectors, and track switches.
  - 2. Carriers: Nylon wheels on trolley carrier at top of every second panel, sized to carry imposed loads, with threaded pendant bolt for vertical adjustment.
- F. Performance:
  - 1. Acoustic Performance:
    - a. Sound Transmission Class (STC): 48 to 52 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90, on panel size of 100 sq ft.



2. Installed partition system track capable of supporting imposed loads, with maximum deflection of 1/360 of span.
- G. Accessories:
  1. Pocket Enclosures where required: Door, frame, and trim to match adjacent panels. Reference plan for conditions.
  2. Pass Door: Single door, 36 inch wide by 84 inch high opening; same design and construction as panel; fit door with perimeter acoustic gaskets, concealed closer, and keyed lock.
  3. Acoustic Sealant: As recommended by partition manufacturer.

### **2.03 MATERIALS**

- A. Aluminum Extrusions: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.
- B. Markerboard: Porcelain enamel on steel, laminated to core.
- C. Acoustic Insulation:
  1. Type: As required for acoustic performance indicated.
  2. Thickness: As required for acoustic performance indicated.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated on shop drawings.
- B. Verify track supports are laterally braced and will permit track to be level within 1/4 inch of required position and parallel to the floor surface.
- C. Verify floor flatness of 1/8 inch in 10 feet, non-cumulative.
- D. Verify wall plumbness of 1/8 inch in 10 feet, non-cumulative.

### **3.02 INSTALLATION**

- A. Install partition in accordance with manufacturer's instructions and ASTM E557.
- B. Fit and align partition assembly level and plumb.
- C. Lubricate moving components.
- D. Install acoustic sealant to achieve required acoustic performance.
- E. Coordinate electrical connections.

### **3.03 ADJUSTING**

- A. Adjust partition assembly to provide smooth operation from stacked to full open position. Do not over-compress acoustic seals.
- B. Visually inspect partition in full extended position for light leaks to identify a potential acoustical leak.
- C. Adjust partition assembly to achieve lightproof seal.

### **3.04 CLEANING**

- A. Clean finish surfaces and partition accessories.
- B. Condition markerboard surfaces in accordance with manufacturer's instructions.

### **3.05 CLOSEOUT ACTIVITIES**

- A. Demonstrate operation of partition and identify potential operational problems.

### **END OF SECTION**



**SECTION 10 2600**  
**WALL AND DOOR PROTECTION**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Corner guards.

**1.02 RELATED REQUIREMENTS**

- A. Section 09 2116 - Gypsum Board Assemblies: Placement of supports in stud wall construction.

**1.03 REFERENCE STANDARDS**

- A. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics 2023, with Editorial Revision.
- B. ASTM D543 - Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents 2021.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023b.
- D. ASTM F476 - Standard Test Methods for Security of Swinging Door Assemblies 2023.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Indicate physical dimensions, features, wall mounting brackets with mounted measurements, anchorage details, and rough-in measurements.
- C. Shop Drawings: Include plans, elevation, sections, and attachment details.
- D. Samples: Submit samples illustrating component design, configurations, joinery, color and finish.
  - 1. Submit two sections of corner guards, 6 inches long.
- E. Manufacturer's Instructions: Indicate special procedures, perimeter conditions requiring special attention.
- F. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- G. Maintenance Data: Manufacturer's instructions for care and cleaning of each type of product. Include information about both recommended and potentially detrimental cleaning materials and methods.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver wall and door protection items in original, undamaged protective packaging. Label items to designate installation locations.
- B. Protect work from moisture damage.
- C. Protect work from UV light damage.
- D. Do not deliver products to project site until areas for storage and installation are fully enclosed, and interior temperature and humidity are in compliance with manufacturer's recommendations for each type of item.
- E. Store products in either horizontal or vertical position, in compliance with manufacturer's instructions.

**1.06 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a one year period after Date of Substantial Completion.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Corner Guards:
  - 1. Babcock-Davis: [www.babcockdavis.com/#sle](http://www.babcockdavis.com/#sle).
  - 2. Construction Specialties, Inc: [www.c-sgroup.com/#sle](http://www.c-sgroup.com/#sle).
  - 3. Inpro: [www.inprocorp.com/#sle](http://www.inprocorp.com/#sle).
  - 4. Koroseal Interior Products: [www.koroseal.com/#sle](http://www.koroseal.com/#sle).
  - 5. Nystrom, Inc: [www.nystrom.com/#sle](http://www.nystrom.com/#sle).
  - 6. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 PERFORMANCE CRITERIA**

- A. Impact Strength: Unless otherwise noted, provide protection products and assemblies that have been successfully tested for compliance with applicable provisions of ASTM D256 and/or ASTM F476.
- B. Chemical and Stain Resistance: Unless otherwise noted, provide protection products and assemblies with chemical and stain resistance complying with applicable provisions of ASTM D543.

### **2.03 PRODUCT TYPES**

- A. Corner Guards - Surface Mounted:
  - 1. Material: Polyethylene terephthalate (PET or PETG); PVC-free with full height extruded aluminum retainer.
  - 2. Performance: Resist lateral impact force of 100 lbs at any point without damage or permanent set.
  - 3. Surface Burning Characteristics: Provide assemblies with flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
  - 4. Width of Wings: 2 inches.
  - 5. Corner: Radiused.
  - 6. Color: As selected from manufacturer's standard colors.
  - 7. Length: One piece.
  - 8. Preformed end caps.
- B. Adhesives and Primers: As recommended by manufacturer.
- C. Mounting Brackets and Attachment Hardware: Appropriate to component and substrate.

### **2.04 FABRICATION**

- A. Fabricate components with tight joints, corners and seams.
- B. Pre-drill holes for attachment.
- C. Form end trim closure by capping and finishing smooth.

### **2.05 SOURCE QUALITY CONTROL**

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Provide wall and door protection systems of each type from a single source and manufacturer.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.
- B. Verify that substrate surfaces for adhered items are clean and smooth.
- C. Start of installation constitutes acceptance of project conditions.

### **3.02 INSTALLATION**

- A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to supporting construction.
- B. Position corner guard 4 inches above finished floor to 48 inches high or height as indicated on drawings.

### **3.03 TOLERANCES**

- A. Maximum Variation From Required Height: 1/4 inch.
- B. Maximum Variation From Level or Plane For Visible Length: 1/4 inch.

### **3.04 CLEANING**

- A. Clean wall and door protection items of excess adhesive, dust, dirt, and other contaminants.

**END OF SECTION**



**SECTION 10 2800**  
**TOILET, BATH, AND LAUNDRY ACCESSORIES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Commercial toilet accessories.
- B. Commercial shower and bath accessories.
- C. Under-lavatory pipe supply covers.
- D. Electric hand dryers.
- E. Diaper changing stations.
- F. Fold down changing tables, fixed height and adjustable height.
- G. Dressing benches, wall-mounted folding and stationary with back support.
- H. Utility room accessories.
- I. Owner Furnished, Contractor Installed products, (OFCI).

**1.02 RELATED REQUIREMENTS**

- A. Section 06 1000-Rough Carpentry: Concealed supports for accessories, including in wall framing and plates and above ceiling framing.
- B. Section 10 2113.19 - Plastic Toilet Compartments.

**1.03 REFERENCE STANDARDS**

- A. 2012 TAS - Texas Accessibility Standards 2012.
- B. ADA Standards - 2010 ADA Standards for Accessible Design 2010.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- D. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service 2022.
- E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2023.
- F. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2023.
- G. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium 2017 (Reapproved 2022).
- H. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass 2018.
- I. ASTM C1822 - Standard Specification for Insulating Covers on Accessible Lavatory Piping 2021.
- J. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023b.
- K. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use 2022.
- L. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi 2015, with Editorial Revision (2021).

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

- B. Provide accessories for Integrated Room Mock-ups as required in Section 01 4000-Quality Requirements.
- C. Review delivery dates for Owner-Furnished products.

#### **1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
  - 2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
  - 3. Include electrical characteristics.
- C. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
  - 1. Identify locations using room designations indicated.
  - 2. Identify accessories using designations indicated.
- D. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.
- E. Closeout Submittals:
  - 1. Submit under provisions of Section 01 7800 Closeout Submittals.
  - 2. Maintenance Data: For accessories to include in maintenance manuals.

#### **1.06 WARRANTY**

- A. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace items that fail in materials or workmanship within specified warranty period.
  - 1. All accessories not specifically listed otherwise, (1) year from date of Substantial Completion.
  - 2. Mirrors: Failures include, but are not limited to, visible silver spoilage defects; warranty period (5) years from date of Substantial Completion.
  - 3. Electric Hand Dryers:
    - a. Sensors - (1) year from date of Substantial Completion.
    - b. Motor Brushes - (3) years from date of Substantial Completion.
    - c. All Other Components - (10) years from date of Substantial Completion.

### **PART 2 PRODUCTS**

#### **2.01 OWNER FURNISHED PRODUCTS**

- A. Owner will furnish products indicated. The work includes receiving, unloading, handling, storing, protecting, and installing Owner-Furnished products.
- B. Owner-Furnished Products:
  - 1. Toilet Tissue (Roll) Dispenser (**T1**).
  - 2. Paper Towel (Roll) Dispenser (**T6**).
  - 3. Soap Dispenser (**T11**) or (**T12**). See drawings for mounting type required.

#### **2.02 MANUFACTURERS**

- A. Commercial Toilet, Shower, and Bath Accessories:
  - 1. Basis of Design: Model numbers listed are per Bradley Corporation unless noted otherwise.
  - 2. ASI - American Specialties, Inc: [www.americanspecialties.com/#sle](http://www.americanspecialties.com/#sle).
  - 3. Bobrick Washroom Equipment, Inc.: [www.bobrick.com](http://www.bobrick.com).
  - 4. Bradley Corporation: [www.bradleycorp.com/#sle](http://www.bradleycorp.com/#sle).
  - 5. GAMCO – (General Accessory Mfg. Co): [www.gamcousa.com](http://www.gamcousa.com).



6. Georgia-Pacific Professional: [www.blue-connect.com/#sle](http://www.blue-connect.com/#sle).
  7. Kimberly Clarke Professional: [www.kcprofessional.com](http://www.kcprofessional.com).
  8. Substitutions: Section 01 6000 - Product Requirements.
- B. Under-Lavatory Pipe Supply Covers:
1. Plumberex Specialty Products, Inc: [www.plumberex.com/#sle](http://www.plumberex.com/#sle).
  2. Substitutions: Section 01 6000 - Product Requirements.
- C. Electric Hand/Hair Dryers:
1. American Dryer, Inc: [www.americandryer.com](http://www.americandryer.com).
  2. ASI - American Specialties, Inc: [www.americanspecialties.com](http://www.americanspecialties.com).
  3. Bobrick Washroom Equipment, Inc.: [www.bobrick.com](http://www.bobrick.com).
  4. Bradley Corporation: [www.bradleycorp.com](http://www.bradleycorp.com).
  5. Dyson, Inc: [www.dyson.com](http://www.dyson.com)
  6. Excel Dryer: [www.exceldryer.com/#sle](http://www.exceldryer.com/#sle).
  7. Saniflow: [www.saniflowcorp.com](http://www.saniflowcorp.com).
  8. World Dryer Corporation: [www.worlddryer.com/#sle](http://www.worlddryer.com/#sle).
  9. Substitutions: Section 01 6000 - Product Requirements.
- D. Diaper Changing Stations:
1. Koala Kare Products: [www.koalabear.com/#sle](http://www.koalabear.com/#sle).
  2. Substitutions: 01 6000 - Product Requirements.
- E. Fold Down Changing Tables:
1. MAX-Ability, Inc.: [www.max-ability.com](http://www.max-ability.com).
  2. Substitutions: 01 6000 - Product Requirements.
- F. Dressing Benches:
1. Access Able Designs, Inc.: [www.accessabledesigns.com](http://www.accessabledesigns.com).
  2. Substitutions: 01 6000 - Product Requirements.
- G. Utility Room Accessories:
1. Bradley Corporation: [www.bradleycorp.com](http://www.bradleycorp.com).
  2. Zurn Industries, LLC: [www.zurn.com](http://www.zurn.com).
  3. Substitutions: 01 6000 - Product Requirements.
- H. Source Limitations: Provide products of each category type by single manufacturer.

### **2.03 MATERIALS**

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
  1. Grind welded joints smooth.
  2. Fabricate units made of metal sheet of seamless sheets with flat surfaces.
- B. Keys: Provide four keys for each accessory to Owner; master key lockable accessories.
- C. Stainless Steel Sheet: ASTM A666, Type 304.
- D. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.
- E. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.
- F. Mirror Glass: Tempered safety glass, ASTM C1048; and ASTM C1036 Type I, Class 1, Quality Q2, with silvering as required.
- G. Adhesive: Two component epoxy type, waterproof.
- H. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof.
- I. Expansion Shields: Fiber or rubber as recommended by accessory manufacturer for component and substrate.

## 2.04 FINISHES

- A. Stainless Steel: Satin finish, unless otherwise noted.
- B. Chrome/Nickel Plating: ASTM B456, SC 2, satin finish, unless otherwise noted.
- C. Galvanizing for Items Other than Sheet: Comply with ASTM A123/A123M; galvanize ferrous metal and fastening devices.
- D. Shop Primed Ferrous Metals: Pretreat and clean, spray apply one coat primer and bake.
- E. Back paint components where contact is made with building finishes to prevent electrolysis.

## 2.05 COMMERCIAL TOILET ACCESSORIES

- A. Mirrors: Stainless steel framed, **(T9)** and **(T10)**: 1/4 inch thick tempered safety glass; ASTM C1048.
  - 1. Frame: 0.05 inch angle shapes, with mitered and welded and ground corners; satin finish.
  - 2. Back of unit shall be galvanized steel, secure to frame with concealed screws, equipped with integral horizontal hanging brackets and separate wall hanger for concealed mounting.
  - 3. Products:
    - a. Basis of Design: **(T9)**, Model 7802-1836, single lavatory mirror, 18" x 36".
    - b. Basis of Design: **(T10)**, Model 7802-2460, full-length mirror, 24" x 60".
- B. Grab Bars, **(T4)** and **(T5)**: Stainless steel, textured surface.
  - 1. Heavy Duty Grab Bars:
    - a. Push/Pull Point Load: 250 pound-force, minimum.
    - b. Dimensions: 1-1/2 inch outside diameter, minimum 0.05 inch wall thickness, exposed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.
    - c. Finish: Satin.
    - d. Length and Configuration: As indicated on drawings.
    - e. Mounting: Flanges with concealed fasteners.
    - f. Products:
      - 1) Basis of Design: **(T4)**, Model 8122-00136, 36 inch grab bar.
      - 2) Basis of Design: **(T5)**, Model 8122-00142, 42 inch grab bar.
- C. Combination Sanitary Napkin/Tampon Dispenser, **(T21)**: Stainless steel, semi-recessed.
  - 1. Door: Seamless 0.05 inch door with returned edges and two tumbler locks.
  - 2. Cabinet: Fully welded, 0.03 inch thick sheet.
  - 3. Operation: 25 cent coin required to operate dispenser. Provide locked coin box, separately keyed.
  - 4. Minimum capacity: 30 napkins and 28 tampons.
  - 5. Products:
    - a. Basis of Design: Model 4017-10-45.
- D. Sanitary Napkin Disposal Unit, **(T2)**: Stainless steel, with self-closing door, locking bottom panel with full-length stainless steel piano-type hinge, removable receptacle.
  - 1. Mounting: Partition mounted, dual access or surface mounted; refer to drawings.
  - 2. Products:
    - a. Basis of Design: Model 4721-15, partition mounted, serves two compartments.
    - b. Basis of Design: Model 4722-15, surface mounted.
- E. Single Robe Hook **(T13)**: Heavy-duty stainless steel, single-prong, rectangular-shaped bracket and backplate for concealed attachment, satin finish.
  - 1. Products:
    - a. Basis of Design: Model 9114.

## 2.06 COMMERCIAL SHOWER AND BATH ACCESSORIES

- A. Shower Curtain Rod, (**T17**): Stainless steel tube, 1 inch outside diameter, 0.04 inch wall thickness, satin-finished, with 3 inch outside diameter, minimum 0.04 inch thick satin-finished stainless steel flanges, for concealed mounting.
  - 1. Length: Refer to drawings.
  - 2. Products:
    - a. Basis of Design: Model 9538, shower curtain rod.
- B. Shower Curtain, (**T17**):
  - 1. Material: 9-oz. Nylon reinforced vinyl, 0.014 inch thick with top edge hemmed, matte finish, with antibacterial treatment, flameproof and stain-resistant.
  - 2. Size: Minimum 2-inches wider than the opening by 78 inches high, hemmed edges.
  - 3. Grommets: Corrosion-resistant metal; pierced through top hem on 6 inch centers.
  - 4. Color: White.
  - 5. Shower Curtain Hooks: Stainless steel spring wire designed for snap closure.
  - 6. Products:
    - a. Basis of Design: Model 9537, shower curtain.
    - b. Basis of Design: Model 9536, shower curtain hooks.
- C. Shower Grab Bars, (**T14**), (**T15**), (**T15A**) and (**T16**): Stainless steel, textured surface.
  - 1. Heavy Duty Grab Bars:
    - a. Push/Pull Point Load: 250 pound-force, minimum.
    - b. Dimensions: 1-1/2 inch outside diameter, minimum 0.05 inch wall thickness, exposed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.
    - c. Finish: Satin.
    - d. Length and Configuration: As indicated on drawings.
    - e. Mounting: Flanges with concealed fasteners.
    - f. Products:
      - 1) Basis of Design: (**T14**), Model 8122-00124, 24 inch.
      - 2) Basis of Design: (**T15**), Model 8122-0591528, L-shaped 15"x28". Refer to drawings for handing.
      - 3) Basis of Design: (**T15A**), Model 8122-0592436, L-shaped 24"x36". Refer to drawings for handing.
      - 4) Basis of Design: (**T16**), Model 8122-00148, 48 inch.
- D. Folding Shower Seat, (**T18**): Wall-mounted surface; welded tubular seat frame, structural support members, hinges, and mechanical fasteners of Type 304 stainless steel, reversible seat. Refer to drawings for handing.
  - 1. Seat: Phenolic or polymeric composite one-piece seat or seat slats, of white color.
  - 2. Size: TAS/ADA Standards compliant.
  - 3. Products:
    - a. Basis of Design: Model 9569.
- E. Wall-Mounted Soap Dish, (**T22**): Heavy duty, seamless stainless steel, surface-mounted with drain holes, satin finish; with concealed mechanical fastening suitable for substrate and backplate.
  - 1. Coordinate location with grab bar to avoid conflicts.
  - 2. Products:
    - a. Basis of Design: Model 9014
- F. Towel Bar, (**T19**): Stainless steel, six hooks and 60-inch backplate with exposed surfaces, satin finish.
  - 1. Mounting: Surface mounted.
  - 2. Products:
    - a. Basis of Design: Model 9946.

- G. Single Robe Hook (**T13**): Heavy-duty stainless steel, single-prong, rectangular-shaped bracket and backplate for concealed attachment, satin finish.
  - 1. Products:
    - a. Basis of Design: Model 9114.

## **2.07 UNDER-LAVATORY PIPE AND SUPPLY COVERS**

- A. Under-Lavatory Pipe and Supply Covers (**T23**):
  - 1. Insulate exposed drainage piping, including hot, cold, and tempered water supplies under lavatories or sinks to comply with TAS/ADA Standards.
  - 2. Exterior Surfaces: Smooth non-absorbent, non-abrasive surfaces.
  - 3. Construction: 1/8 inch flexible PVC.
    - a. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
    - b. Comply with ASTM C1822, type indicated.
    - c. Microbial and Fungal Resistance: Comply with ASTM G21.
  - 4. Color: White.
  - 5. Fasteners: Reusable, snap-locking fasteners with no sharp or abrasive external surfaces.
  - 6. Products:
    - a. Basis of Design: Plumberex Specialty Products, Inc; Plumberex Handy-Shield Maxx: [www.plumberex.com/#sle](http://www.plumberex.com/#sle).

## **2.08 ELECTRIC HAND DRYERS**

- A. Electric Hand Dryers, (**T7**): Traditional fan-in-case type, with downward fixed nozzle.
  - 1. Operation: Automatic, sensor-operated on and off.
  - 2. Mounting: Surface mounted.
  - 3. Cover: Cast iron with white porcelain enamel finish.
    - a. Tamper-resistant screw attachment of cover to mounting plate.
  - 4. Fan/Heater Control: Field adjustable down to approximately half-speed with corresponding reduction in heat output.
  - 5. Supply Voltage: 120 V, single phase, 60 Hz, nominal.
  - 6. Electric Hand Dryer Products:
    - a. Basis of Design: Speedflow as manufactured by Saniflow

## **2.09 DIAPER CHANGING STATIONS**

- A. Diaper Changing Station, (**T20**): Wall-mounted folding diaper changing station for use in commercial toilet facilities, meeting or exceeding ASTM F2285.
  - 1. Compliant with the 2012 TAS, Texas Accessibility Standards for work surface height and protruding object limitations, both open and closed positions.
  - 2. Material: Stainless steel.
  - 3. Mounting: Surface mounted, with unit projecting not more than 4 inches from wall when closed.
  - 4. Color: Satin finish.
  - 5. Minimum Rated Load: 250 pounds.
  - 6. Products:
    - a. Basis of Design: Koala Kare Products, a Division of Bobrick; Model KB310-SSWM.

## **2.10 FOLD DOWN CHANGING TABLES**

- A. Fixed Height Wall Mounted Fold Down Changing Station, (**T27**):
  - 1. Length: 75.25"
  - 2. Width: 31"
  - 3. Fixed Mounting Height: Verify with Owner before installation.
  - 4. Weight Capacity: 440 lbs.
  - 5. Color: Graphite Gray.
  - 6. Warranty: Three year limited warranty on parts; one year on labor.

7. Product:
  - a. Basis of Design: MAX-Ability, Inc., Pressalit Care 3000, model R8435318301, fixed height adult changing table, [www.max-ability.com](http://www.max-ability.com).
- B. Adjustable Height Wall Mounted Fold Down Changing Station, (T28):
  1. Length: 75.25"
  2. Width: 31"
  3. Height: Adjustable from 12" to 38 7/8"
  4. Electrical:
    - a. Operate at 24v / 1amp via 120v wall outlet
    - b. Integrated transformer and US 8' power cord
    - c. Linak liquid tight actuator and control system
    - d. Chain drive; maintenance free motor
  5. Weight Capacity: 440 lbs.
  6. Color: Graphite Gray.
  7. Warranty: Three year limited warranty on parts; one year on labor.
  8. Product:
    - a. Basis of Design: MAX-Ability, Inc., Pressalit Care 3000, model R8592318301, electrically height adjustable adult changing table, [www.max-ability.com](http://www.max-ability.com).

## 2.11 DRESSING BENCHES

- A. Dressing Bench, Wall-Mounted Folding, (T25):
  1. Description: Stainless steel tubular frame, 42"W x 20"D seat and 500-lb. capacity.
    - a. Seat: 1/2-inch slatted phenolic seat; color as selected by Architect.
  2. Mounting: Surface, anchored to wall.
  3. Basis of Design: Access Able Designs, Inc.; Model D-101-42: [www.accessabledesigns.com](http://www.accessabledesigns.com).
- B. Dressing Bench, Stationary w/Back Support, (T26):
  1. Description: Stainless steel tubular frame with feet flanges, 42"W x 20"D seat with 24"H back and 900-lb. capacity.
    - a. Seat and Back Rest: 1/2-inch slatted phenolic seat with solid phenolic back rest; color as selected by Architect.
  2. Mounting: Surface, anchored to floor.
  3. Basis of Design: Access Able Designs, Inc.; Model DST-101-42: [www.accessabledesigns.com](http://www.accessabledesigns.com).

## 2.12 UTILITY ROOM ACCESSORIES

- A. Mop and Broom Holder, (T24): 0.05 inch thick stainless steel, Type 304, hat-shaped channel.
  1. Holders: Three spring-loaded rubber cam holders.
  2. Length: Manufacturer's standard length for number of holders.
  3. Mounting: Surface.
  4. Products:
    - a. Basis of Design: Model 9953 as manufactured by Bradley Corporation.
- B. Mop Basin Hose and Bracket, (T24A): Heavy-duty 5/8-inch, cloth-reinforced flexible rubber hose with 3/4-inch brass coupling. Stainless steel, Type 304, bracket with rubber grip.
  1. Length: 30 inches.
  2. Mounting: Surface.
  3. Products:
    - a. Basis of Design: Zurn Light Commercial Plumbing Products; Zurn Z1996-HH: [www.zurn.com](http://www.zurn.com).

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify existing conditions before starting work.
-

- B. Verify exact location of accessories for installation.
- C. For electrically-operated accessories, verify that electrical power connections are ready and in the correct locations.
- D. Verify that field measurements are as indicated on drawings.
- E. See Section 06 1000-Rough Carpentry for installation of blocking, reinforcing plates, and concealed anchors in walls and ceilings.

### **3.02 PREPARATION**

- A. Deliver inserts and rough-in frames to site for timely installation.
- B. Provide templates and rough-in measurements as required.

### **3.03 INSTALLATION**

- A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.
- D. Locate accessories in order that they do not interfere with door swings or use of fixtures. Install recessed accessories after wall finishes have been completed.
- E. Anchor accessories with bolts, plates, and approved type fasteners. Take down any loose items and repair damaged wall surfaces. Accessories anchored to toilet partitions shall be thru-bolted.
- F. Mount surface mounted accessories to backup material with toggle bolts, plumb and align.
- G. At metal stud partitions, provide fire-retardant treated wood blocking for anchorage of grab bars, wall-mounted seats and benches, baby changing stations, and other such wall-mounted accessories where additional loads are anticipated.
  - 1. For accessories protruding 3-inches or less from the wall, Contractor may utilize ClarkDietrich Danback Flexible Wood Backing System with FlamePRO fire-retardant treated wood.
- H. At recessed electric hand dryers located in metal stud wall partitions, install rigid sound insulation in wall around unit.

### **3.04 PROTECTION**

- A. Protect installed accessories from damage due to subsequent construction operations.

### **3.05 SCHEDULE**

- A. Provide the following accessories at type of room scheduled, whether indicated on the drawings or not. Refer to drawings for configuration and mounting heights. Provide (1) of each per accessory listed unless otherwise noted or designated as Owner-furnished.
- B. Type C – Toilet Compartments
  - 1. Type C1 Standard Compartment:
    - a. T1 Toilet Tissue (Roll) Dispenser.
    - b. T2 Sanitary Napkin Disposal (at designated female restrooms, grades 6 to adult only).
  - 2. Type C2, C3 and C5 Accessible Compartments:
    - a. T1 Toilet Tissue (Roll) Dispenser
    - b. T2 Sanitary Napkin Disposal (at designated female restrooms, grades 6 to adult only).
    - c. T4 Grab Bars, 36 inch.
    - d. T5 Grab Bars, 42 inch.
  - 3. Type C4 Ambulatory Accessible Compartment:
    - a. T1 Toilet Tissue (Roll) Dispenser.

- b. T2 Sanitary Napkin Disposal (at designated female restrooms, grades 6 to adult only).
  - c. T5 Grab Bars, 42 inch; (2) each.
- C. Type L - Lavatories:
  - 1. T9 Mirror.
  - 2. T11 Soap Dispenser. At locations with multiple lavatories, provide at a ratio of (1) dispenser per (2) lavatories.
  - 3. T23 Undersink Piping Covers per lavatory.
- D. Type MS - Mop Sink Locations:
  - 1. T24 Mop and Broom Holder.
  - 2. T24A Mop Basin Hose and Bracket.
- E. Type S – Showers:
  - 1. Type S1 Transfer Type Shower Compartment:
    - a. T13 Coat/Clothes Hook. Locate adjacent to shower seat wall.
    - b. T15 Shower Grab Bar.
    - c. T17 Shower Curtain & Rod w/Curtain Hooks.
    - d. T18 Folding Shower Seat.
    - e. T22 Wall-Mounted Soap Dish.
  - 2. Type S2 Standard Roll-In Type Shower Compartment:
    - a. T13 Coat/Clothes Hook. Locate at nearest adjacent wall to shower.
    - b. T14 Shower Grab Bar, 24 inch, (2) each.
    - c. T16 Shower Grab Bar, 48 inch.
    - d. T17 Shower Curtain & Rod w/Curtain Hooks.
    - e. T22 Wall-Mounted Soap Dish.
  - 3. Type S3 Standard Roll-In Type Shower Compartment w/Seat:
    - a. T13 Coat/Clothes Hook. Locate adjacent to shower seat wall.
    - b. T15A Shower Grab Bar.
    - c. T17 Shower Curtain & Rod w/Curtain Hooks.
    - d. T18 Folding Shower Seat.
    - e. T22 Wall-Mounted Soap Dish.
  - 4. Type S4 Shower Compartment (Non-Accessible):
    - a. T13 Coat/Clothes Hook. Locate at nearest adjacent wall to shower.
    - b. T17 Shower Curtain & Rod w/Curtain Hooks.
    - c. T22 Wall-Mounted Soap Dish.
  - 5. Multi-User Showers:
    - a. T19 Towel Bar. Locate at nearest adjacent wall to shower; (2) each.
- F. Type T – Toilet Rooms:
  - 1. Type T1 Single-User Toilet Room:
    - a. T1 Toilet Tissue (Roll) Dispenser.
    - b. T2 Sanitary Napkin Disposal (at unisex or designated female restrooms, grades 6 to adult only).
    - c. T4 Grab Bars, 36 inch.
    - d. T5 Grab Bars, 42 inch.
    - e. T6 Paper Towel (Roll) Dispenser.
    - f. T9 Mirror.
    - g. T11 Soap Dispenser.
    - h. T13 Coat/Clothes Hook.
    - i. T23 Undersink Piping Covers.
  - 2. Type T2 Single-User or Family Toilet Room:
    - a. T1 Toilet Tissue (Roll) Dispenser.

- b. T2 Sanitary Napkin Disposal (at unisex or designated female restrooms, grades 6 to adult only).
  - c. T4 Grab Bars, 36 inch.
  - d. T5 Grab Bars, 42 inch.
  - e. T6 Paper Towel (Roll) Dispenser.
  - f. T9 Mirror.
  - g. T11 Soap Dispenser.
  - h. T20 Baby Changing Station.
  - i. T13 Coat/Clothes Hook.
  - j. T23 Undersink Piping Covers.
- G. Type WF - Wash Fountains
- 1. T9 Mirror, one per station.
  - 2. T11 Soap Dispenser, (2) each.
  - 3. T23 Undersink Piping Covers, if wash fountain is not provided with skirt.
- H. Break Rooms, Work Rooms, Clinics, Classrooms:
- 1. T6 Paper Towel (Roll) Dispenser.
    - a. At each sink location
  - 2. T11 Soap Dispenser.
    - a. At each sink location

**END OF SECTION**



**SECTION 10 4400  
FIRE PROTECTION SPECIALTIES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Fire extinguisher cabinets.
- B. Accessories.
- C. Fireman's Knox Items: Box, Padlock, and FDC Plug.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 4100 - Regulatory Requirements
- B. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.

**1.03 DEFINITIONS**

- A. Where indicated on the Drawings, the abbreviation "F.E.C." defines a fire extinguisher and cabinet and the abbreviation "F.E." is for a fire extinguisher without a cabinet.

**1.04 REFERENCE STANDARDS**

- A. FM (AG) - FM Approval Guide Current Edition.
- B. NFPA 10 - Standard for Portable Fire Extinguishers 2022.
- C. UL (DIR) - Online Certifications Directory Current Edition.
- D. International Fire Code.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide extinguisher operational features, color and finish, and anchorage details.
- C. Shop Drawings: Indicate locations of cabinets, cabinet physical dimensions, rough-in measurements for recessed cabinets, locations of individual fire extinguishers, mounting measurements for wall bracket, installation procedures, and accessories required for complete installation.
- D. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.
- G. Material and Safety Data Sheets for all mastics, glues, and adhesives and for insulating material for fire doors.

**1.06 QUALITY ASSURANCE**

- A. Single Source Responsibility: Obtain products in this Section from one manufacturer.
- B. Certifications
  - 1. Provide extinguishers which are U.L. listed and bear the U.L. "Listing Work" for type, rating, and classification.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with requirements of Section 01 6000 - Product Requirements.
- B. Store extinguishers in protected location until after final cleaning is completed.

**1.08 FIELD CONDITIONS**

- A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

## 1.09 WARRANTY

- A. Comply with requirements of Section 01 7800 - Closeout Submittals.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Fire Extinguishers and Cabinets and Accessories:
1. JL Industries, Inc: [www.jlindustries.com](http://www.jlindustries.com).
  2. Kidde, a unit of United Technologies Corp: [www.kidde.com](http://www.kidde.com).
  3. Larsen's Manufacturing Co: [www.larsensmfg.com](http://www.larsensmfg.com).
  4. Nystrom, Inc: [www.nystrom.com/sle](http://www.nystrom.com/sle).
  5. Potter-Roemer: [www.potterroemer.com](http://www.potterroemer.com).
  6. Samson Products, Inc.: [www.samsonproducts.com](http://www.samsonproducts.com).
  7. Strike First Corporation of America: [www.strikefirstusa.com](http://www.strikefirstusa.com).
  8. Substitutions: See Section 01 6000 - Product Requirements.
- B. Fireman's Knox Box:
1. Knox Company; [www.knoxbox.com](http://www.knoxbox.com).
  2. Substitutions: See Section 01 6000 - Product Requirements.

### 2.02 FIRE EXTINGUISHERS

- A. Provide fire extinguishers on hooks in all Mechanical or Electrical Rooms. All other fire extinguishers are to be in a semi-recessed wall-mounted cabinet.
- B. Contractor shall provide and install all fire extinguishers specified for a project and inspections are to be current at Substantial Completion.
- C. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
1. Provide extinguishers labeled by UL (DIR) or FM (AG) for purpose specified and as indicated.
  2. UL Rating: 2A-10B:C, minimum.
- D. Multipurpose Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gauge.
1. Product: MP10 for all typical installations.
  2. Product: MP5 at Elevator Equipment Rooms and Science Labs.
  3. Class: A:B:C type.
  4. Size: 5 and 10 pound.
- E. Halotron I Type Fire Extinguishers: Stainless steel tank, with pressure gage.
1. Product: HT5 at Computer Lab.
  2. Class: A:B:C type.
  3. Size: 5 pound.
- F. Wet Chemical Type Fire Extinguishers: Stainless steel tank, with pressure gage.
1. Product: WC-6L (6 liter capacity) at Kitchen (20 ft. away from hood).
  2. Class: K.
  3. Size: 1.6 gallons.

### 2.03 FIRE EXTINGUISHER CABINETS

- A. Product - reference schedule below: Model numbers are based on Larsen's Manufacturing Co.

Wall Construction	Model	Fire Rated	Projection	Box Depth	Wall Depth
3-5/8" Metal Stud or 6" CMU	AL-2409-6R	No	2-1/2"	6"	4"
3-5/8" Metal Stud or 6" CMU	AL-FS-2409-R4	Yes	3-1/2"	6"	4"

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8" CMU or wider	AL-2409-6R	No	2-1/2"	6"	4"
8" CMU or wider	AL-FS-2409-6R	Yes	2-1/2"	6"	4-7/8"
8" CMU	AL-2712-RA	No	4"	8"	4-1/2"
8" CMU	AL-FS-2712-RA	Yes	4"	8"	5-3/8"

- B. Cabinet Configuration: Semi-recessed type.
  - 1. Projected Trim: Returned to wall surface, with 2-1/2 inch projection, and 1 inch wide face.
- C. Door: 0.036 inch metal thickness, reinforced for flatness and rigidity with roller type catch. Hinge doors for 180 degree opening with continuous piano hinge. Provide solid doors at athletic and shop areas.
- D. Door Glazing: Tempered glass, clear, 1/8 inch thick, and set in resilient channel glazing gasket.
- E. Cabinet Mounting Hardware: Appropriate to cabinet, with pre-drilled holes for placement of anchors.
- F. Weld, fill, and grind components smooth.
- G. Finish of Cabinet Exterior Trim and Door: Clear satin anodized aluminum.
- H. Finish of Cabinet Interior: White colored enamel.

## 2.04 ACCESSORIES

- A. Extinguisher Brackets: Formed steel, chrome-plated.
- B. If extinguisher is not located in a cabinet, provide bracket no. 860.
- C. Graphic Identification: Applied decal use vertical decal spelling.

## 2.05 FIREMAN'S KNOX BOX

- A. Provide and install emergency access lock box where shown on the drawings.
  - 1. Mount: Recessed (7"x7"x3.25"), provide recessed mounting kit with face flange. Mount at 6'-0" above ground level, verify with fire marshal.
  - 2. Lock: U.L. Listed. Double action rotating tumblers and hardened steel pins accessed by a biased cut key.
  - 3. Finish: Pre-treatment – Zinc Phosphate; Final Coating – weather resistant polyester powdercoat.
    - a. Color: Black.
  - 4. Alarm: Alarm tamper switch. Connect to buildings security system.
  - 5. Model: "Knoxbox Series 3200".
- B. Provide and install two-position electric override key switch with mounting plate. Provide lock cover with weather resistant operation and an emergency agency ID label. Controls emergency power system shutoff. Refer to electrical drawings for locations.
  - 1. Mount: Recessed, provide recessed mounting kit with face flange. Mount as directed by fire marshal.
  - 2. Alarm: Alarm tamper switch. Connect to buildings security system.
  - 3. Model: "Knoxbox 3502 with key switch".

## 2.06 FIREMAN'S KNOX PADLOCK

- A. Provide padlock at access gates where indicated on plan.
  - 1. 3/8" diameter stainless steel shackle.
  - 2. Heavy-duty brass body with EPDM boot.
  - 3. Model: Knox 3753.

## 2.07 FIREMAN'S KNOX FDC PLUG

- A. Provide FDC plugs at all locations.
  - 1. Plug shall be locking style with Knox key wrench.
  - 2. Bright stainless cover.
  - 3. Verify plug size and threads with Fire Department.

4. Model: Knox Model 3011.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify rough openings for cabinet are correctly sized and located.

#### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install cabinets plumb and level in wall openings at locations shown on the Drawings. Install compliant with applicable accessibility requirements.
- C. Secure rigidly in place.
- D. Place extinguishers and accessories in cabinets.

**END OF SECTION**

**SECTION 10 5100  
LOCKERS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Metal lockers.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete base construction.
- B. Section 06 1000 - Rough Carpentry: Wood blocking and nailers.

**1.03 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's published data on locker construction, sizes and accessories.
- C. Shop Drawings: Indicate locker plan layout, numbering plan.
- D. Samples: Submit two samples 12 by 12 inches in size, of each color scheduled.
- E. Manufacturer's Installation Instructions: Indicate component installation assembly.

**1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with requirements of Section 01 6000 - Product Requirements.
- B. Protect locker finish and adjacent surfaces from damage.

**1.05 WARRANTY**

- A. See Section 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide one year manufacturer warranty for repair or replacement of lockers that fail in material or workmanship.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Metal Lockers:
  - 1. ASI Storage Solutions, Inc.: [www.asilockers.com](http://www.asilockers.com).
  - 2. Debourgh Manufacturing Co.: [www.debourgh.com](http://www.debourgh.com).
  - 3. List Industries: [www.listindustries.com](http://www.listindustries.com).
  - 4. Lyon Workspace Products: [www.lyonworkspace.com](http://www.lyonworkspace.com).
  - 5. Penco Products, Inc: [www.pencoproducts.com](http://www.pencoproducts.com).
  - 6. Republic Storage Systems Co: [www.republicstorage.com](http://www.republicstorage.com).
  - 7. WEC Manufacturing: [www.itswec.com](http://www.itswec.com)
  - 8. Win-Holt Equipment: [www.winholt.com](http://www.winholt.com).
  - 9. Substitutions: See Section 01 6000 - Product Requirements.

**2.02 LOCKER APPLICATIONS**

- A. Size, type and quantity: Reference Drawings.
  - 1. Basis of Design:
    - a. Typical Lockers: Republic Storage Systems, Single Point II Corridor.
    - b. Typical Athletic Lockers: Republic Storage Systems, Single Point II Athletic Welded.

**2.03 METAL LOCKERS**

- A. All Lockers: Factory assembled, made of formed sheet steel, Cold-rolled mild steel, uncoated, stretcher leveled; metal edges finished smooth without burrs; baked enamel finished inside and out.
  - 1. Where ends or sides are exposed, provide flush panel closures.
  - 2. Provide filler strips where indicated, securely attached to lockers.
  - 3. Colors: Refer to Section 01 6210 - Schedule of Materials and Colors.

- B. Assembly:
  - 1. Typical Lockers: (KD) Rivet with backup washer to provide permanent shake-proof fastening.
  - 2. Athletic Lockers: All welded construction.
- C. Typical Locker Body: Formed and flanged; with steel stiffener ribs.
  - 1. Body, Shelves, Tops and Trim: 24 gage, 0.0239 inch.
  - 2. Base: Reference drawings for base height and details
- D. Athletic Locker Body: Formed and flanged; with steel stiffener ribs.
  - 1. Body, Shelves, Tops and Trim: 16 gage, 0.060 inch, minimum.
  - 2. Base: Reference drawings for base height and details
- E. Frames: Formed channel shape, welded and ground flush, welded to body, resilient gaskets and latching for quiet operation.
  - 1. Door Frame: 16 gage, 0.0598 inch, minimum.
  - 2. Provide ventilation slots in top and bottom of door frame.
- F. Doors: Hollow channel edge construction, 1 inch thick; welded construction, channel reinforced top and bottom with intermediate stiffener ribs, grind and finish edges smooth.
  - 1. Door Outer Face: 14 gage, 0.0747 inch, minimum.
  - 2. Form recess for operating handle and locking device.
  - 3. Ventilation Method for Typical Lockers: Provide ventilation slots in top and bottom of door.
  - 4. Ventilation Method for Athletic Lockers: Doors for tiered lockers shall have diamond shaped perforations 3/4" wide by 1 1/2" high to provide free air flow while leaving sufficient metal for rigidity and strength. Doors for box lockers 3, 4, 5 and 6 openings high are perforated for free airflow using small diamond perforations 7/16" wide by 15/16" high.
- G. Hinges: Two for doors under 42 inches high; three for doors over 42 inches high; 2" high, 5-knuckle, full loop, tight pin style, weld securely to locker body and double riveted to the inside of the door.
  - 1. Hinge Thickness: 14 gage, 0.0747 inch.
- H. Coat Hooks: Stainless steel or zinc-plated steel.
  - 1. Two single prong wall hooks and one double prong back hook for all single, double, and triple tier lockers. For lockers over 42" high, provide one hat shelf. Lockers under 20" high are not equipped with hooks.
- I. Number Plates: Provide rectangular shaped aluminum plates. Form numbers 1/2 inch high of block font style, in contrasting color.
- J. Latching: Latching shall be achieved by securing a frame hook to the locker side frame located midway up on the door.
  - 1. Locking device is Owner furnished Owner Installed loose padlock. The frame hook shall have a padlock hasp protruding through the stainless steel recessed pocket. Hasp shall be welded to channel frame member. Riveted hasps are not acceptable.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that prepared bases are in correct position and configuration.
- B. Verify bases and embedded anchors are properly sized.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install lockers plumb and square.
- C. Place and secure on prepared base.
- D. Secure lockers with anchor devices to suit substrate materials. Minimum Pullout Force: 100 lb.
- E. Bolt adjoining locker units together to provide rigid installation.

- F. Install end panels, filler panels, and sloped tops.
- G. Install accessories.
- H. Conceal fasteners on all face frames.
- I. Replace components that do not operate smoothly.

**3.03 CLEANING**

- A. Clean locker interiors and exterior surfaces.

**END OF SECTION**





**SECTION 10 5626.13**  
**ATHLETIC MOBILE STORAGE SHELVING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES:**

- A. Mechanically assisted, carriage mounted high-density mobile storage units, support rails, fabrication, and installation including leveling of support rails.

**1.02 RELATED WORK, NOT FURNISHED:**

- A. Structural floor system capable of supporting live and dead loads required by prevailing building codes, including rolling loads of storage units to be installed.
- B. Finish floor covering materials and installation.

**1.03 RELATED SECTIONS:**

- A. Section 03 3000 – Cast-In-Place Concrete
- B. Division 9 – Finishes, relating to finish floor and base materials

**1.04 REFERENCES**

- A. American National Standards Institute (ANSI) Standards:
  - 1. Applicable standards for fasteners used for assembly.
- B. American Society for Testing and Materials (ASTM) Standards:
  - 1. Applicable standards for steel materials used for fabrication.
- C. American Institute Of Steel Construction (AISC) Standards
- D. American Institute Of Steel Construction (AISC) Standards:
  - 1. Applicable standards for steel materials used for fabrication.

**1.05 SYSTEM DESCRIPTION**

- A. General: The system consists of four-post shelving units mounted on manufacturer's track-guided carriages to form a compact storage system. System design permits access to any single aisle by manually moving units until the desired aisle is opened. The carriage/rail system provides uniform carriage movement along the total length of travel, even with unbalanced loads.
- B. Movement Controls: Triple or single arm operating wheels with rotating hand knobs shall be provided on the accessible (drive) ends of shelf units, centered on the end panel, located 40 inches (1051MM) from the base of each unit to permit units to be moved to create a single aisle opening. Turning the handle transmits power through chain drive to drive wheels on each carriage.
- C. Drive System: The system shall be designed with a positive type mechanically-assisted drive which minimizes end play, ensures there is no play in the drive handle, and that carriages will stop without drifting.
  - 1. System shall include a chain sprocket drive system for each movable carriage to ensure that carriages move uniformly along the total length of travel, even with unbalanced loads. All system components shall be selected to ensure a smooth, even movement along the entire carriage length. Drive system gearing shall be designed to permit 1 lb. of force applied to the drive handle to move a minimum of 4,000 lbs. of load.
  - 2. A tensioning device shall be provided on each chain drive with provision for adjusting tension without removing end panels.
  - 3. All bearings used in the drive mechanism shall be permanently shielded and lubricated.
- D. Safety Features:
  - 1. Color-coded visual indicators shall provide verification that carriages are in a locked or unlocked mode.

2. A single safety lock button, mounted on each operating wheel hub, will permit moving a carriage in either direction to create a new access aisle when pulled out (unlocked), or locking the carriage when pushed in.
- E. Finishes:
  1. Fabricated Metal Components And Assemblies: Manufacturer's standard powder coat paint finish.
  2. End Panels, Accessible Ends: Manufacturer's standard powder coat paint finish.
- F. Ease of Movement: Provide mechanically assisted units capable of being moved by exerting a maximum horizontal force of 5 pounds on the operating wheel.

#### **1.06 SUBMITTALS**

- A. Product Data: Submit manufacturer's product literature and installation instructions for each type of shelving, track and installation accessory required. Include data substantiating that products to be furnished comply with requirements of the contract documents.
- B. Shop Drawings: Show fabrication, assembly, and installation details including descriptions of procedures and diagrams. Show complete extent of installation layout including clearances, spacings, and relation to adjacent construction in plan, elevation, and sections. Indicate clear exit and access aisle widths; access to concealed components; assemblies, connections, attachments, reinforcement, and anchorage; and deck details, edge conditions, and extent of finish flooring within area where units are to be installed.
  1. Show installation details at non-standard conditions. Furnish floor layouts, technical and installation manuals for every unit shipment with necessary dimensions for rail layout and system configuration at the project site. Include installed weight, load criteria, furnished specialties, and accessories.
  2. Provide layout, dimensions, and identification of each unit corresponding to sequence of installation and erection procedures. Specifically include the following:
    - a. Location, position and configuration of tracks on all floors.
    - b. Plan layouts of positions of carriages, including all required clearances.
    - c. Details of shelving, indicating method and configuration of installation in carriages.
  3. Provide location and details of anchorage devices to be embedded in or fastened to other construction.
  4. Provide installation schedule and complete erection procedures to ensure proper installation.
- C. Selection Samples: For initial selection of colors and textures, submit manufacturer's color charts consisting of actual product pieces, showing full range of colors and textures available.
- D. Warranty: Submit draft copy of proposed warranty for review by the Architect and Owner.
- E. Maintenance Data: Provide in form suitable for inclusion in maintenance manuals for mobile storage units. Data shall include operating and maintenance instructions, parts inventory listing, purchase source listing, emergency instructions, and related information.
  1. Submit manufacturer's instructions for proper maintenance materials and procedures.
  2. Submit manufacturer's printed instructions for maintenance of installed work, including methods and frequency recommended for maintaining optimum condition under anticipated use conditions. Include precautions against using materials and methods which may be detrimental to finishes and performance.

#### **1.07 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Engage an experienced manufacturer who is ISO 9001 certified for the design, production, installation and service of carriage mounted high-density mobile storage units and support rails. Furnish certificate attesting manufacturer's ISO 9001 quality system registration.
- B. Installer Qualifications: Engage an experienced installer who is a manufacturer's authorized representative for the specified products for installing carriages and anchoring shelving units to carriages.

1. Minimum Qualifications: 10-years experience installing systems of comparable size and complexity to specified project requirements.
2. Installers must be current fiscal year (FY 2019) trained and certified. Provide letter from manufacturer with bid certifying current year certification.
3. Guaranteed 24-hour service response time.
4. A permanent San Antonio office location for tech service for at least 5 years.

#### **1.08 DELIVERY, STORAGE AND HANDLING**

- A. Follow manufacturer's instructions and recommendations for delivery, storage and handling requirements.

#### **1.09 PROJECT CONDITIONS**

- A. Field Measurements: Verify dimensions before fabrication. Indicate verified measurements on Shop Drawings. Coordinate fabrication and delivery to ensure no delay in progress of the Work.
- B. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating mobile storage units. Coordinate construction to ensure actual dimensions correspond to established dimensions.

#### **1.10 SEQUENCING AND SCHEDULING**

- A. Sequencing: Coordinate storage shelving system installation with other work to minimize possibility of damage and soiling during remainder of construction period.
- B. Scheduling: Plan installation to commence after finishing operations, including painting have been completed.
- C. Built-In Items: Provide components which must be built in at a time which causes no delays general progress of the Work.
- D. Pre-installation Conference: Schedule and conduct conference on project site to review methods and procedures for installing mobile storage units including, but not limited to, the following:
  1. Review project conditions and levelness of flooring and other preparatory work performed under other contracts.
  2. Review and verify structural loading limitations.
  3. Recommended attendees include:
    - a. Owner's Representative.
    - b. Prime Contractor or representative.
    - c. The Architect.
    - d. Manufacturer's representative.
    - e. Subcontractors or installers whose work may affect, or be affected by, the work of this section.

#### **1.11 WARRANTY**

- A. Provide a written warranty, executed by Contractor, Installer, and Manufacturer, agreeing to repair or replace units which fail in materials or workmanship within the established warranty period. This warranty shall be in addition to, and not a limitation of, other rights the Owner may have under General Conditions provisions of the Contract Documents.
- B. Warrant the entire movable compact shelving installation against defects in materials for five (5) years and workmanship for a period of one (1) year from date of acceptance by the Owner.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. General: Products are based upon mobile shelving system products manufactured by Spacesaver Corporation. Contingent on meeting all specification requirements fully, other acceptable manufacturers may be included if approved by architect as equal. The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution.

- B. No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least ten days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work, including changes in the work of other contracts that incorporation of the proposed substitution would require, shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.
- C. If the Architect approves a proposed substitution prior to receipt of Bids, such approval will be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner.
- D. No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.
- E. Local distributor is Southwest Solutions Group Inc, 15002 Tradesman Drive San Antonio, Texas 78249. 210-336-5086 Attn: Jeff Rosaasen. [jrosaasen@southwestsolutions.com](mailto:jrosaasen@southwestsolutions.com)

## **2.02 BASIC MATERIALS**

- A. General: Provide materials and quality of workmanship which meet or exceed established industry standards for products specified. Material thicknesses/gauges are manufacturer's option unless indicated otherwise.
- B. High Pressure Plastic Laminates: NEMA LD-3, GP-28, Vertical Grade.

## **2.03 MANUFACTURED COMPONENTS**

- A. Rails:
  - 1. Storage systems 12' of length or less: Rail shall include a one-piece, 1045 hardened steel bar inset into an extruded aluminum alloy #6061-T6 base channel with a combined weight of 1.5 lbs. per foot. Overall 1 1/2" high with a 3 1/2" base channel with an anti-tip groove and a 5/8" running top surface, for dual flange guidance. All rail joints to be overlapped and spliced with roll-pins. Rail shall have anchor bolts on minimum 12" centers. Rail must have 750 lbs capacity per linear foot
    - a. Rail configuration shall permit attachment to top of structural floor system with provision for leveling rails to compensate for variations in floor surface level.
  - 2. Storage systems over 12' in length or more: Rail shall be solid one (1) piece structural steel rail with central flange guidance and tongue and groove connection points. Rail must have 1,000 lbs capacity per linear foot. Material: ASTM/AISI Type 1035 or 1045 steel, or equal, manufacturer's selection. Two piece spot welded rails are unacceptable. Butt joint rail connections are unacceptable.
    - a. All wood floor and entry ramps to be fully leveled plywood decking with no gaps between rails and wood floor. All entry ramps must be 24" minimum two piece ADA compliant entry ramp.
    - b. Rail configuration shall permit attachment to top of structural floor system with provision for leveling rails to compensate for variations in floor surface level.
  - 3. Minimum Contact Surface: 5/8 inch (16MM) wide.
  - 4. Provide rail connections designed to provide horizontal and vertical continuity between rail sections, to gradually transfer the concentrated wheel point load to and from adjoining rail sections.
  - 5. Once rails are leveled, they shall be supported the full length with the specified grout for rail system. Floorless systems do not require grout.
- B. Carriages:

1. Storage system under 12' in length: Carriages shall be a maximum 750 lbs. (1,116 kg) per lineal carriage foot (meter) capacity. Wheel housing shall be constructed of 12-gauge steel and include two welded shelving support plates of 7-gauge steel. Carriage side profiles shall be constructed of 14-gauge steel and shall contain four rivets and four bolt holes with which to secure shelving upright post to the carriage. Carriage wheel housings, carriage side profiles and shelving shall be powder coat painted from manufacturer's standard colors.
    - a. All carriage wheels shall be precision machined and 3" (76 mm) in diameter. All carriage wheel housings shall be joined together by a full-length 1" (25 mm) diameter tube connecting shaft. All wheels shall have two permanently lubricated and shielded ball bearing assemblies with spacers on both sides of all wheels to minimize friction between wheels and carriage. Anti-drift clutch brake assembly shall be provided on all mechanical assist carriages installed on floorless rail.
    - b. Shelving must recess minimum of 2" into and interlock with wheel housings. Surface mount shelving is unacceptable. Carriage design shall provide a minimum of two shelving retention rivets and two carriage bolts to securely retain each shelving post. Top mounting of shelving onto carriages is unacceptable.
  2. Storage system over 12' in length: Provide manufacturer's design movable carriages fabricated of welded wheel assembly with bolted steel and riveted construction. Galvanized carriage components are unacceptable. The use of cross-bracing is unacceptable.
    - a. Design all carriages with a 3/4" lip minimum on both sides of all carriage that will allow the shelving uprights to recess into the carriage. Top mounting of shelving onto carriages is unacceptable.
  3. Provide each carriage with two wheels per rail.
  4. Mechanical Safety Sweep (as required)
- C. Drive / Guide System:
1. Design: Provide drive system which prevents carriage whipping, binding and excessive wheel/rail wear under normal operation.
    - a. If line shafts are used, all wheels on one side of carriage shall drive.
    - b. If synchronized drives are used, a minimum of one wheel assembly driving both sides of carriage at center location required. Drive shaft shall exhibit no play or looseness over the entire length of that assembly.
  2. Shafts: Solid steel rod or tube.
  3. Shaft Connections: Secured couplings.
  4. Bearing Surfaces: Provide rotating load bearing members with ball or roller bearings. Provide shafts with pillow block or flanged self-aligning type bearings.
- D. Wheel Sections:
1. Low-Profile Wheel Section: Minimum 12 ga. fixture-welded wheel sections to ensure that, once installed; bottom storage shelf is no higher than 4.25 inches (108mm) above top of rail. Locate wheel assemblies under each upright to distribute loads directly to wheels.
  2. Wheel Size: Minimum 3 inches (76MM), outside diameter drive and load wheels.
  3. Guide Wheels: All wheels and all locations.
- E. Face Panels:
1. Materials: High Pressure plastic laminate clad particle board with plastic edging on vertical edges.
  2. Finishes: Selected from manufacturer's standard available colors and patterns.
- F. Shelving: (Four Post)

## **2.04 FABRICATION**

- A. General: Coordinate fabrication and delivery to ensure no delay in progress of the Work.
- B. Wheels: Provide precision machined units with permanently shielded and lubricated bearings.

- C. Carriage Wheel Sections: Fabricate Carriage wheel sections to provide two heavy-duty 7 ga. support plates to support the full weight of shelving posts.
- D. Carriages: Fabricate to ensure no more than 1/4 inch (6MM) maximum deviation from a true straight line. Splice and weld to ensure no permanent set or slippage in any spliced or welded joint when exposed to forces encountered in normal operating circumstances.
- E. Shelving, Supports and Accessories: See individual descriptions in "Shelving" paragraphs.

## **2.05 FINISHES**

- A. Colors: Selected by Architect from manufacturer's standard available colors.
- B. Paint Finish: Provide factory applied electrostatic powder coat paint. Meet or exceed specifications of the American Library Association. Enamel based paint is unacceptable.
- C. Laminate Finish: Provide factory applied high pressure laminate panels at locations indicated on approved shop drawings.
- D. Edgings: Provide preformed edging, color-matched to unit colors selected.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine floor surfaces with Installer present for compliance with requirements for installation tolerances and other conditions affecting performance of mobile storage units.
- B. Verify that building structural system is adequate for installing mobile storage units at locations indicated on approved shop drawings.
- C. Verify that intended installation locations of mobile storage units will not interfere with nor block established required exit paths or similar means of egress once units are installed.
- D. Prepare written report, endorsed by Installer, listing conditions detrimental to proper performance of mobile storage units, once installed.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 INSTALLATION**

- A. Rails:
  - 1. Depressed slab provided by contractor for installation of rail.
  - 2. Lay out rails using full length units to the maximum extent possible. Locate and position properly, following dimensions indicated on approved shop drawings. Verify thickness of finished floor materials to be installed (by others) and install level 1/16 inch (0.6MM) above finished floor surfaces.
  - 3. Verify rail position and level; anchor to structural floor system with anchor type and spacings indicated on approved shop drawings.
- B. Shelving Units Installation:
  - 1. General: Follow layout and details shown on approved shop drawings and manufacturer's printed installation instructions. Position units level, plumb; at proper location relative to adjoining units and related work.
  - 2. Carriages:
    - a. Place movable carriages on rails. Ensure that all wheels track properly and centering wheels are properly seated on centering rails. Fasten multiple carriage units together to form single movable base where required.
    - b. Position fixed carriage units to align with movable units.
  - 3. Shelving Units:
    - a. Stabilize shelving units following manufacturer's written instructions. Reinforce shelving units to withstand the stress of movement where required and specified.

### **3.03 FIELD QUALITY CONTROL**

- A. Verify shelving unit alignment and plumb after installation. Correct if required following manufacturer's instructions.

- B. Remove components which are chipped, scratched, or otherwise damaged and which do not match adjoining work. Replace with new matching units, installed as specified and in manner to eliminate evidence of replacement.

#### **3.04 ADJUSTING**

- A. Adjust components and accessories to provide smoothly operating, visually acceptable installation.

#### **3.05 CLEANING**

- A. Immediately upon completion of installation, clear components and surfaces. Remove surplus materials, rubbish and debris resulting from installation upon completion of work and leave areas of installation in neat, clean condition.

#### **3.06 DEMONSTRATION/TRAINING**

- A. Schedule and conduct demonstration of installed equipment and features with Owner's personnel.
- B. Schedule and conduct maintenance training with Owner's maintenance personnel. Training session should include lecture and demonstration of all maintenance and repair procedures that end user personnel would normally perform.

#### **3.07 PROTECTION**

- A. Protect system against damage during remainder of construction period. Advise Owner of additional protection needed to ensure that system will be without damage or deterioration at time of substantial completion.

**END OF SECTION**





**SECTION 10 7300  
PROTECTIVE COVERS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Pre-engineered, free-standing, pre-finished extruded aluminum walkway covers.
- B. Pre-engineered, pre-finished extruded aluminum wall mounted hanging canopies.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete

**1.03 REFERENCE STANDARDS**

- A. AA ADM – Aluminum Design Manual; As Referenced in the International Building Code.
- B. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2012.
- C. AAMA 612 - Voluntary Specification, Performance Requirements and Test Procedures for Combined Coatings of Anodic Oxide and Transparent Organic Coatings on Architectural Aluminum; 2002.
- D. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performance Organic Coatings on Aluminum Extrusions and Panels - American Architectural Manufacturers Association; 2011
- E. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 6000 Tensile Strength; 2010.
- F. ASTM A792/A792M - Steel Sheet, 55% Aluminum-Zinc Alloy Coated by Hot Dip Process; 2010.
- G. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2010.
- H. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2012.
- I. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws and Studs; 2002 (Reapproved 2008).

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Prior to commencement of fabrication, submit detailed shop drawings, showing all profiles, sections of all components, finishes, fastening details, and manufacturer's technical and descriptive data. Include field dimensions of openings and elevations on shop drawings.
- C. Design Data: Submit comprehensive structural analysis of design for the specified loads. Stamp and sign calculations by profession engineer.
- D. Shop drawing sheets that include engineering information designed by the Contractor's Delegated Design Engineer shall be signed and sealed in accordance with the Texas Engineering Practice Act. Sheets that do not provide information designed by the Contractor's Engineer do not require being signed and sealed. Calculation packages require a signed and sealed cover sheet only. Any submittals requiring to be signed and sealed that are received without the signature and seal will be rejected without review.
- E. Samples: 12 inches by 12 inches minimum illustrating design, workmanship and finish color.
- F. Designer Qualification Statement.
- G. Specimen Warranty: Furnish a copy of manufacturer's standard warranty.
- H. Installer Qualification Statement.

**1.05 QUALITY ASSURANCE**

- A. Designer Qualifications: Perform design under direct supervision of a Professional Engineer experienced in design of this type of work licensed in Texas.

- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with no less than five years of documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section, and;
  - 1. With minimum five years of documented experience.
  - 2. Approved by manufacturer.
- D. Coordination: Coordinate work of this section with work of other sections which interface with covered walkway or canopy system (sidewalks, curbs, building fascias, etc.).

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials to project site ready for erection.
- B. Package using methods that prevent damage during shipping and storage on site.
- C. Store materials under cover and elevated above grade.

#### **1.07 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a one-year period after date of Substantial Completion.
- C. Finish Warranty: Provide manufacturer's ten year warranty on factory finish against cracking, peeling, and blistering and two years for anodized finishes.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Protective Covers:
  - 1. AVAdek: [www.avadek.com](http://www.avadek.com).
  - 2. Architectural Fabrication, Inc.: [www.arch-fab.com](http://www.arch-fab.com).
  - 3. Aluminum Techniques Inc.: [www.aluminumtechniques.com](http://www.aluminumtechniques.com).
  - 4. Canopy Solutions, LLC: [www.canopy-solutions.com](http://www.canopy-solutions.com).
  - 5. DITT-Deck, Dittmer: [www.dittdeck.com](http://www.dittdeck.com).
  - 6. Peachtree Protective Covers: [www.peachtreecovers.com](http://www.peachtreecovers.com).
  - 7. East Texas Canopy, Inc: [www.easttexascanopy.com](http://www.easttexascanopy.com).
  - 8. Substitutions: See Section 01 6000 - Product Requirements.

#### **2.02 WALKWAY COVERS**

- A. Extruded Aluminum Walkway Cover shall consist entirely of extruded aluminum sections(roll-formed not acceptable). System shall consist of heli-arc welded, one-piece rigid structural bents (column and beam assemblies), decking, fascia, accessory items and hardware to provide a complete system.
  - 1. Configuration: As indicated on drawings.
  - 2. Sizes: As indicated on drawings.
  - 3. Design Criteria: Design and fabricate to resist loads without failure, damage, or permanent deflection as dictated by the applicable building code. Structure shall be capable of sustaining and supporting a concentrated load such as being walked upon.
    - a. For welded material, the tensile ultimate strength, "Ftuw", and tensile yield strength, "Ftyw", shall be used to determine available strength within weld-affected zone.
    - b. Design, fabrication, and erection of aluminum load-carrying structures, members, and connections shall be in accordance with AA ADM - Aluminum Design Manual; As Referenced in the International Building Code.
  - 4. Finish: Class I Color Anodized Finish: AAMA 611 AA-M12C22A44 Electrolytically deposited colored anodic coating not less than 0.7 mils thick.
  - 5. Finish Color: Refer to Schedule of Colors for approved color selection.
  - 6. Provide a complete system ready for erection at project site.
  - 7. Shop-fabricate to the greatest extent possible; disassemble if necessary for shipping.

8. The Contractor's Walkway Cover Engineer shall not bear on the existing building unless the Walkway Cover Engineer or another Structural Engineer hired by the Contractor evaluates the capacity of the existing structure to withstand loads that would be imposed by the walkway cover and either verifies that there is sufficient capacity or modifies the existing structure in a way that is approved by the Architect. If the covering is connected to the existing building, the Walkway Cover Engineer shall design the connection. For proposal purposes, the Contractor shall assume that it is not acceptable to bear on or attach to the existing building other than with flashing. The Contractor shall be permitted to submit alternative layouts of columns for consideration by the Architect if the alternative layout does not increase the cost of construction or the schedule.
- B. Concrete Foundations
1. Where the foundations have been designed and detailed in the Structural Drawings, the Contractor's Walkway Cover Engineer shall design the attachment of the walkway cover to these foundations. The reactions shall not exceed the allowable values provided in the Structural Drawings. If no values are provided in the Drawings, the Contractor shall submit a request for information requesting this information from the Structural Engineer prior to the design and detailing of the Walkway Covers.
  2. Where foundation design and detailing is not included in the Architectural or Structural Drawings, the foundation shall be designed by the Contractor's Walkway Cover Engineer in accordance with the following:
    - a. All foundations designed by the Walkway Cover Engineer shall be required to comply with the recommendations of the Geotechnical Engineer in the soil reports provided as part of this project manual.
    - b. If the Geotechnical Engineering report provided is not applicable to this project, the Contractor's Walkway Cover Engineer shall design the foundation to be consistent with the minimum requirements of the locally adopted version of the International Building Code. If the minimum requirements of the locally adopted version of the International Building Code require that a soil investigation be performed, the Contractor shall hire the Owner's Geotechnical Engineer at no additional cost to the Owner (including the cost for this work in the Contractor's proposal for the main contract to do this project) and it shall not be permitted to increase the construction schedule beyond the agreed upon schedule to perform the project which is to include the time it takes to have the soil report performed if necessary.
  3. The Contractor shall have foundations designed and installed to accommodate existing conditions such as nearby existing foundations (which shall not be undermined) and overhead obstructions (which may require low-overhead pier drilling equipment).
  4. Refer to Section 03 3000 - Cast-In-Place Concrete.
  5. Sleeves (styrofoam blockout) shall be furnished by the walkway cover manufacturer and placed by the general contractor.

## **2.03 CANOPY SYSTEMS**

- A. The Contractor's Canopy Engineer shall design the attachment of the canopies to the Structure. Where allowable reactions are provided on the Structural Drawings, the Contractor's Canopy Engineer shall design their attachments to not exceed these allowable reactions. Where no allowable reaction is provided, the Contractor's Canopy Engineer shall evaluate the Structure provided and limit reactions so as to not exceed its structural capacity or modify the existing structure in a way that is approved by the Architect. The Contractor shall be permitted to submit alternative configurations for consideration by the Architect if the alternative configurations do not increase the cost of construction or the schedule.
- B. Canopy: Shop fabricated, shop finished, extruded aluminum decking, (roll-formed not acceptable), outriggers, fascia and hanging rod assemblies free of defects impairing strength, durability or appearance.
1. Configuration: As indicated on drawings.
  2. Sizes: As indicated on drawings.

3. Design Criteria: Design and fabricate to resist loads without failure, damage, or permanent deflection as dictated by the applicable building code. Structure shall be capable of sustaining and supporting a concentrated load such as being walked upon.
  - a. For welded material, the tensile ultimate strength, "Ftuw", and tensile yield strength, "Ftyw", shall be used to determine available strength within weld-affected zone.
  - b. Design, fabrication, and erection of aluminum load-carrying structures, members, and connections shall be in accordance with AA ADM - Aluminum Design Manual; As Referenced in the International Building Code.
4. Finish: Class I Color Anodized Finish: AAMA 611 AA-M12C22A44 Electrolytically deposited colored anodic coating not less than 0.7 mils thick.
5. Finish Color: Refer to Schedule of Colors for approved color selection.
6. Provide a complete system ready for erection at project site.
7. Shop-fabricate to the greatest extent possible; disassemble if necessary for shipping.

## **2.04 MATERIALS**

- A. Aluminum Extrusions: ASTM B209 or B 221.
- B. Aluminum Coated Steel Sheet: ASTM A792/A792M.
- C. Concealed Structural Supports: Aluminum, or steel coated for corrosion resistance and dissimilar metal isolation.
- D. Fasteners: ASTM F593 stainless steel or ASTM A 307 carbon steel.
  1. Deck Screws (rivets not permitted): Type 18-8 non-magnetic stainless steel sealed with a neoprene "O" ring beneath 5/8" outside dimension, conical washer.
  2. Fascia Rivets: Size 3/16" by 1/2" grip range aluminum rivets with aluminum mandrel.
  3. Bolts: All bolts, nuts and washers to be 18-8 non-magnetic stainless steel.
  4. Tek Screws: not permitted

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine substrates and site area for conditions that might prevent satisfactory installation.
- B. Verify that dimensions of supporting structure are within plus/minus 1/8 inch of dimensions shown on shop drawings.
- C. Verify that all adjacent painting, roofing, masonry work, and other work that might damage finish has been completed prior to installation of sun screens.
- D. Do not install until after all adjacent painting, roofing and masonry have been completed.
- E. Do not proceed with installation until all conditions are satisfactory.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's installation instructions.
- B. Set units level, plumb, with uniform joints, and aligned with building elements.
- C. Separate dissimilar metals using concealed bituminous paint or non-absorbent gasket.
- D. Anchor units to structure as indicated on the drawings.
- E. Do not cut or trim aluminum members without approval of manufacturer; do not install damaged members.
- F. Touch-up damaged finish coating using material provided by manufacturer to match original coating.

### **3.03 TOLERANCES**

- A. Maximum Variation from Level/Plumb: Plus/Minus 1/8 inch.

**3.04 CLEANING**

- A. Clean exterior surfaces units of dust and debris; follow manufacturer's cleaning instructions for the finish used.

**3.05 PROTECTION**

- A. Protect units after installation to prevent damage due to other work until the Date of Substantial Completion.

**END OF SECTION**



**SECTION 10 7500  
FLAGPOLES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Aluminum Flagpoles.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete base and foundation construction.
- B. Section 09 9000 - Painting and Coating: Site painting.

**1.03 REFERENCE STANDARDS**

- A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2021.
- B. ASTM B241/B241M - Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube 2022.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on pole, accessories, and configurations.
- C. Shop Drawings: Indicate detailed dimensions, base details, anchor requirements, and imposed loads.
- D. Maintenance Data: Provide lubrication and periodic maintenance requirement schedules.

**1.05 QUALITY ASSURANCE**

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. External Halyard System: Provide manufacturers standard halyard system, including:
  - 1. Provide flash collar of spun aluminum.
  - 2. Provide finial ball 6" in diameter of 14 gauge, spun aluminum on each flagpole.
  - 3. Provide truck assembly on each flagpole consisting of cast aluminum assembly with ball bearing non-fouling, revolving double truck.
  - 4. Provide cast aluminum cleats, 9" long, two per flagpole, with aluminum fastenings.
  - 5. Provide two continuous 3/8" diameter braided nylon halyards per flagpole, each with two bronze snaps with neoprene or vinyl covers.
  - 6. At each cleat, provide a cast aluminum cover with hasp for padlock, staple, and tamper-proof screws.
  - 7. Finish exposed surfaces to match the flagpoles.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Spiral wrap flagpole with protective covering and pack in protective shipping tubes or containers.
- B. Protect flagpole and accessories from damage or moisture.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Flagpoles:
  - 1. Acme Flagpoles Company, Division of Lingo, Inc.: [www.acmelingo.com](http://www.acmelingo.com).
  - 2. American Flagpole: [www.americanflagpole.com](http://www.americanflagpole.com).
  - 3. Babcock-Davis Associates, Inc.: [www.babcock-davis.com](http://www.babcock-davis.com).
  - 4. Concord Industries, Inc: [www.concordindustries.com](http://www.concordindustries.com).
  - 5. Morgan-Frances Flagpoles: [www.morgan-frances.com](http://www.morgan-frances.com)

6. Pole-Tech Co., Inc: [www.polettech.com](http://www.polettech.com).
7. Substitutions: See Section 01 6000 - Product Requirements.

## **2.02 FLAGPOLES**

- A. Flagpoles:
  1. Material: Aluminum.
  2. Design: Cone tapered.
  3. Mounting: Ground mounted type.
  4. Outside Butt Diameter: 6 inches.
  5. Outside Tip Diameter: 3.5 inches.
  6. Nominal Wall Thickness: 156 inches.
  7. Nominal Height: 35 ft; measured from top of base. Where more than one pole is located in a group, all poles shall be 35 ft. high.
  8. Halyard: External type.
- B. Performance Requirements:
  1. Structural Performance: Provide flagpoles capable of withstanding the effects of wind loads as determined according to NAAMM FP 1001, Guide Specifications for Design of Metal Flagpoles.
  2. Base flagpole design on maximum standard size nylon flag suitable for use with pole or flag size indicated, whichever is more stringent.

## **2.03 POLE MATERIALS**

- A. Aluminum: ASTM B221 (ASTM B 221M) , 6063 alloy , T6 temper.

## **2.04 ACCESSORIES**

- A. Finial Ball: Aluminum, 6 inch diameter.
- B. Truck Assembly: Cast aluminum; revolving, stainless steel ball bearings, non-fouling.
- C. Cleats: 9 inch size, aluminum with stainless steel fastenings, two per halyard.
- D. Cleat Box: Aluminum, with built-in hinge and hasp assembly, attached to pole with tamper proof screws inside box.
- E. Halyard: 5/16 inch diameter nylon braided with steel or bronze core.
- F. Connecting Sleeve For Multiple Section Poles: Same material as pole, precision fit for field assembly of pole, concealed fasteners.

## **2.05 MOUNTING COMPONENTS**

- A. Foundation Tube Sleeve: AASHTO M 36, corrugated 16 gage, 0.0598 inch steel, galvanized, depth of 36 inches.
- B. Lighting Ground Rod: 18 inch long copper rod, 3/4 inch diameter.
- C. Lightning Ground Cable: Copper No. 6 AWG, soft drawn.

## **2.06 FINISHING**

- A. Metal Surfaces in Contact With Concrete: Asphaltic paint.
- B. Aluminum: Anodized to AA-C22-A42; Class 1, clear color
- C. Finial: Spun Aluminum finish.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that concrete foundation is ready to receive work and dimensions are as indicated on shop drawings.



**3.02 PREPARATION**

- A. Coat metal sleeve surfaces below grade and surfaces in contact with dissimilar materials with asphaltic paint.

**3.03 INSTALLATION**

- A. Install flagpole, base assembly, and fittings in accordance with manufacturer's instructions.
- B. Fill foundation tube sleeve with concrete specified in Section 03 3000.
- C. Install foundation plate and centering wedges for flagpoles base set in concrete base and fasten.

**3.04 TOLERANCES**

- A. Maximum Variation From Plumb: 1 inch.

**3.05 ADJUSTING**

- A. Adjust operating devices so that halyard function smoothly.
- B. Install the flagpoles in strict accordance with the manufacturer's recommendations as approved by the Architect, aligning plumb to a vertical tolerance of one in 1,000 and adjusting operating components for optimum smoothness of operation.

**END OF SECTION**



**SECTION 11 2336  
COMMERCIAL APPLIANCES**

**PART 1 – GENERAL**

**1.01 SECTION INCLUDES**

- A. Commercial Washer-Extractors
- B. Commercial Drying Tumblers
- C. Commercial Ice Machines

**1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete
- B. Division 22 - Plumbing
- C. Division 23 - Heating, Ventilating and Air-Conditioning
- D. Division 26 - Electrical

**1.03 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product data: Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
  - 1. Materials list of items proposed to be provided under this Section;
  - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
  - 3. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

**1.04 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. The contractor shall furnish a written guarantee warranting all materials, devices, equipment and workmanship to be free of defects for a period of one (1) year from the date of completion and acceptance. Any defects in materials, devices, equipment and workmanship which become apparent within the guarantee period shall be repaired and replaced by the contractor at his own expense and at no additional cost to the Owner.
- C. After the above one (1) year period of guarantee, the equipment shall be guaranteed for five (5) years in accordance with standard warranties as offered by the manufacturer.
- D. Provide extended seven (7) year warranty for ice machine evaporator with water filtration system.

**PART 2 – PRODUCTS**

**2.01 EQUIPMENT MANUFACTURERS**

- A. Dexter Laundry: [www.dexter.com](http://www.dexter.com)
- B. Manitowoc Foodservice (Commercial Ice Machines): [www.manitowocice.com](http://www.manitowocice.com)
- C. Substitutions: See Section 01 6000 - Product Requirements.

**2.02 WASHER-EXTRACTORS/DRYING TUMBLERS - COMMERCIAL**

- A. Provide the following products:
  - 1. Washer-Extractor with the following attributes:
    - a. Model: Dexter, model WCVD50HCB-125Z.
    - b. Capacity: 50 lb.
    - c. Electrical Requirements: 208 volt
  - 2. Drying-Tumblers with the following attributes:

- a. Model: Dexter model DCW55HCW-10
- b. Capacity: 55 lb.
- c. Gas:
  - 1) Energy: 165,000 BTU/HR
  - 2) Electrical Requirements: 120/60/1
- d. Air Outlet: 8"

### **2.03 COMMERCIAL ICE MACHINES**

- A. Provide the following products:
  - 1. Ice Machine with Storage Bin:
    - a. Model: Manitowoc - Indigo, model IY0324A
    - b. 24 Hour Yield: 350 lbs.
    - c. Condenser: Air
    - d. Cube Size/Type: Half-dice style ice - 3/8-in. W x 1-1/8 in. D x 7/8-in. H
    - e. Storage Capacity: Bin i333 B-320, 210 lbs.
    - f. Provide inline filter and RPZ.
    - g. Electrical Requirements: 115V/60hz/1 phase with a minimum of 11.5 amp circuit

## **PART 3 – EXECUTION**

### **3.01 INSTALLATION**

- A. This contractor shall do all fitting, fastening, connecting, leveling and placing of all Equipment as required to complete each item in its permanent position.

### **3.02 CLOSEOUT ACTIVITIES**

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.
- B. Demonstrate proper operation of equipment to Owner's designated representative.

### **3.03 SYSTEM STARTUP**

- A. Provide manufacturer's field representative to perform systems startup.
- B. Prepare and start equipment and systems in accordance with manufacturers' instructions and recommendations.
- C. Adjust for proper operation within manufacturer's published tolerances.

### **END OF SECTION**

**SECTION 11 40 00  
FOODSERVICE EQUIPMENT**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. The general provisions of the Contract, including General and Supplementary Conditions and General Documents, apply to the Work specified in this Section.

**1.2 SUMMARY OF THE WORK**

- A. Project Name and Location: **TOMBALL HIGH SCHOOL #3  
TOMBALL, TX**
- B. Approval of Working Surface: Any contractor performing work over the work of other contractors shall notify the Architect of any unsatisfactory conditions. The beginning of work by any contractor shall constitute acceptance of the previous work.
- C. Field Verification of All Dimensions: Before ordering any materials or doing any work, field verify all measurements of the building and be responsible for their accuracy. No extras will be allowed for variations from drawings in existing conditions or work performed under this contract. Any discrepancies found shall be submitted to the Architect or Foodservice Design Professionals (FDP) for instructions before proceeding.
- D. Cutting and Patching: No excessive cutting will be permitted, nor shall any structural members be cut without the written approval of the Architect. Each Contractor shall leave all chases and openings straight, true, and of the proper size in their work, as may be necessary for the proper installation of their and other contractors' work. After such work has been installed, the contractor shall carefully fit around, close, repair, patch, and point up the same as directed to the satisfaction of the Architect.
- E. Cooperation: The General Contractor, all other contractors, and all subcontractors shall coordinate their work with all adjacent work and shall cooperate with all other trades to facilitate the general progress of the work. Each trade shall afford all the other trades every reasonable opportunity to install their work and store their material.
- F. Inspection and Tests: The architect, Owner, Foodservice Design Professionals (FDP), and their representative shall always have access to the work, whether in preparation or progress. Provide proper and safe facilities for such access and inspection.
- G. Fees, Permits, and Inspections: Secure and pay fees for all permits, licenses, and inspections as required by all authorities having jurisdiction. Give all notices and comply with all laws, ordinances, codes, rules, regulations, and contract requirements bearing on the work.

**1.3 SCOPE OF WORK**

- A. Include the Work specified, shown, or inferable as part of Food Service Equipment. Portions of this Work may be subcontracted to those qualified to do such work as necessary because of jurisdictional trade agreements and restrictions.

- B. The General Contractor is responsible for Related Work specified in other Sections: i.e., final plumbing, electrical and mechanical connections. The Kitchen Equipment Contractor (KEC) is responsible for all internal connections.
- C. Specifications and drawings have been prepared to form the basis for procurement, erection, start-up, and equipment adjustment in this contract. Plans and specifications shall be considered mutually explanatory. Work required by one, but not by the other, shall be performed as though required by both. Items required by one but not by the other shall be provided as though required by both. Work shall be accomplished as called for in specifications and shown on drawings so that all equipment items shall be entirely functional for the purpose for which they were designed and intended. Provide all necessary material, tools, equipment, and labor required for the complete delivery, un-crating, erection, and installation as designated on the food service equipment plan and, in the specifications, to be made ready for final connection by the appropriate Division contractors. When there is any discrepancy between drawings and specifications, bidders should seek clarification of any discrepancies from the Architect and or Foodservice Design Professionals (FDP) before bidding.
- D. Should the drawings disagree in themselves or the specifications with the drawings (*and clarification was not sought before bidding*), the higher cost, better quality, more stringent, and greater quantity of the work or materials shall be completed without additional costs to the Owner.

#### **1.4 OTHER DIVISIONS/CONTRACTORS RELATED WORK**

**A. Division 03 (Concrete) is responsible for but not limited to:**

- 1. Slab depressions reinforced concrete wearing bed at prefabricated cold storage assemblies.
- 2. Concrete or masonry platforms (with a finished top and coved base at the perimeter) for the raised setting of food service equipment.
- 3. Slab depressions to receive stainless steel drain trench liner/grate assemblies (provided under this Section).

**B. Division 09 (Finishes) responsible for but not limited to:**

- 1. Interior finished floor with a coved base at prefabricated cold storage assemblies.

**C. Division 10 (Specialties) responsible for but not limited to:**

- 1. S/S Corner Guards throughout the kitchen (unless specified otherwise).
- 2. Lockers.

**D. Division 22 (Plumbing) is responsible for but not limited to:**

- 1. All connections shall follow local codes and national standards, except where plans and specifications exceed those codes and standards.
- 2. Empty PVC and wide-sweep bends for refrigerant piping to beverage lines, Co2 lines, and remote food service equipment refrigeration systems.

3. Rough-in and final connection of plumbing systems to food service equipment and between components (including materials and labor). Accessories provided loose with food service equipment by Section 11 40 00 to be field installed by Division 22. This includes but is not limited to the installation of all faucets (water fill faucets, pre-rinse faucets, etc.), hoses, gas disconnects, and drains from the equipment point of connection to building plumbing systems.
  - a. Kitchen Equipment Contractor is responsible for providing all faucets (water fill faucets, pre-rinse faucets, etc.), drain fittings, mixing valves, control valves, water pressure regulators, vacuum breakers, and all accessories for equipment specified under 11 40 00. Division 22 is responsible for installation.
4. Indirect drain line runs from the equipment to the nearest drain or floor sink—lines to be type 'K' Copper.
5. If any plumbing accessories or fittings are provided loose with equipment by 11 40 00, Div. 22 is to attach to equipment and provide final connection.
6. Gas Supply Systems with all components and fittings required for a complete system.
7. Water Supply Systems with all components and fittings required for a complete system.
8. Compressed Air Systems with all components and fittings required for a complete system.
9. Piping and Drainage Systems (Sanitary and grease laden). Systems are to be cleaned before the final connection with food service equipment.
10. Floor Sinks (Provide and Install). Flange and grates to be flush with the finished floor.
11. Floor Drains (Provide and Install). Flange and grates to be flush with the finished floor.
12. Trench Drains (Provide and Install). Trench Liners provided by 11 40 00. Flange and liners to be flush with the finished floor.
13. Grease Traps as required (Size, Provide, Locate, and Install). Verify with local codes to bypass or pipe thru Grease Trap and/or Interceptor.
14. P-Traps as required (including all disposers).
15. Interconnect water thru Water Filter (Filter provided by 11 40 00 unless otherwise specified) to equipment.
16. Gas Quick Disconnect Installation (Quick Disconnect provided by 11 40 00).
17. Safety Restraint Cable Installation (Safety Restraint Cable Provided by 11 40 00).
18. Specified couplings and piping to all equipment furnished by 11 40 00.
19. Air Compressors (Size, Provide, and Install unless otherwise specified).
20. Water Softeners (Size, Provide, and Install unless otherwise specified).

21. Pressure Boilers (Size, Provide, and Install unless otherwise specified).
22. Hand Sinks (Provide (unless otherwise specified) and Install). Provide a hot water tempering valve if required. Water temperature to be at least 100 degrees and flow for at least 20 seconds.
23. Ice Bin Drain Insulation (Provide and Install).
24. Unions at disposer solenoid valves (Provide and Install).
25. Back Flow Prevention as required (Provide and Install - including all disposers). Back-Siphonage shall be installed at all fixtures and equipment where backflow and/or back-siphonage may occur and where a minimum air gap cannot be provided between the water to the fixture or equipment at its flood/level rim. When furnished with equipment, vacuum breakers shall override the above if acceptable with applicable codes. Division 22 is responsible for verifying requirements with local codes.
26. Janitor Sink with Faucet (Provide and Install).
27. Freeze Proof Hose Bibb at the exterior of the building by receiving door (Provide and Install - unless otherwise specified).
28. Reverse Osmosis Systems (Size, Provide (unless otherwise specified), Locate, and Install).
29. All piping within the counter body or under fabricated counters must be run to a connection point below the counter body by Section 11 40 00—final connection by Division 22.
30. Exhaust Hood condensate drain connections (Provide and Install).
31. Interconnection of ½" CW to Pre-Rinse and Disposers cone/body inlets piped through the solenoid and vacuum breaker.
32. Fire System Piping. The exposed piping is to be chrome plated.
33. Pipe ½" cold water to swirl inlets at disposers.
34. Water Treatment for Ice Builders (Non-Chlorinated water with a PH Level of 10 or Higher) and any drains and overflows. Piping from Ice Builders to Tumble Chillers by Div. 23.
35. Refer to Section 2.2 PLUMBING / MECHANICAL REQUIREMENTS for additional information.

**E. Division 23 (Mechanical) responsible for but not limited to:**

1. All connections shall follow local codes and national standards, except where plans and specifications exceed those codes and standards.
2. Empty EMT Conduit with pull-wire and wide-sweep bends for refrigerant piping to remote food service equipment refrigeration systems.



3. Rough-in and final connection of mechanical systems to food service equipment, cold storage assemblies, and between components (including materials and labor).
4. A mechanical contractor will test and balance rooms and exhaust hoods. **Balance report for food service Exhaust Hoods to be provided to Foodservice Design Professionals (FDP) immediately upon completion (send to Houston.Submittal@fdp.org) and must be submitted with O&M manuals.**
5. Exhaust Hoods, Condensate Hoods, Fire Suppression Systems, connections, and controls (Provide and Install – unless otherwise specified). Provide tempered air at all supply ducts.
  - a. If Exhaust/Condensate Hoods and Fire Suppression Systems are specified under Section 11 40 00, Division 23 is responsible for all Exhaust and Condensate Hood connections (Provide and Install).
6. VFD System and controllers when required by code (Provide and Install).
7. Provide and install all ventilation (direct or indirect), air conditioning, and heating systems (unless otherwise specified).
8. Coordinate Supply and Return ducts above Serving Counters. Cold air is not to blow directly on hot food counters or open-air refrigerated merchandisers.
9. Coordinate Supply and Return ducts away from equipment with top-mounted refrigeration. Air is not to blow directly on compressors.
10. Mechanical Contractor to locate temperature monitors within return ducts.
11. Circulating air above cold storage assemblies (Provide and Install).
12. Circulating air above and in air gaps at Warehouse cold storage assemblies (Provide and Install).
13. Water Chillers as required (Provide, Size, and Locate).
14. Piping from Ice Builders to Tumble Chillers (Size, Provide and Install).
15. Refer to Section 2.2 PLUMBING / MECHANICAL REQUIREMENTS for additional information.

**F. Division 26 (Electrical) responsible for but not limited to:**

1. Rough-in and final connection of electrical systems to food service equipment, cold storage assemblies, and between components (including materials and labor). Accessories provided loose with food service equipment by Section 11 40 00 to be field installed by Division 26.
2. Empty EMT Conduit with pull-wire and wide-sweep bends for refrigerant piping to remote food service equipment refrigeration systems.
3. Empty EMT Conduit with pull-wire and wide-sweep bends for interconnect cables between LAN and POS terminals, change-makers, pre-check units, printers, CPUs, etc.

Division 26 to verify where the conduit will run for POS System (i.e., Manager's Office or IDF Room).

4. Empty EMT Conduit with pull-wire and wide-sweep bends for fire suppression systems. Interconnect the Fire Protection System to panel box shunt trips and building alarms.
5. Cold Storage Assembly Light Fixture Installation (Provided loose by Section 11 40 00).
6. Table Limit Switch Installation (Provided loose by Section 11 40 00).
7. Electrical Materials and Devices (Shunt-trip breakers, surge protectors, lighting control devices, conduit, wire, etc.).
8. Switches and Stainless Steel Disconnects as required (Provide, Locate, and Install – to be in an accessible location).
9. Charging Stations for Forklifts, Pallet Stackers, and Pallet Jacks (Size, Provide, Locate, and Install).
10. Interconnection between Condensate Fan and Dishmachine control panel.
11. Interconnection between Exhaust Hood fans and switch.
12. Interconnection between Exhaust Hood lights and switch.
13. Door Heaters, Lights, Coils, and Heated Pressure Relief Ports pre-wired to the junction box at the top of cold storage assemblies provided by Section 11 40 00—final connection by Div. 26.
14. If any electrical accessories, fittings, and cord/plugs are provided loose with equipment by 11 40 00, Div. 26 is to attach to equipment and provide final connection.
15. Provide waterproof receptacles in wet areas.
16. All electrical connections beneath Exhaust Hoods to extend to shunt trip breakers with electrical panel box for shutdown during fire mode.
17. Receptacles will be pre-wired to Junction Box or Load Center for final connection by Division 26.
18. All electrical lighting, power, and distribution systems.
19. Do not interconnect more than three (3) convenience outlets on one (1) breaker.
20. Other than convenience outlets, all electrical connections on food service plans are dedicated breakers.
21. Doorbell at receiving door (Provide and Install –audible throughout Kitchen, Office, and Dry Storage room).
22. Adequate lighting at receiving door.
23. Dedicated circuit for heated drain line connection in Walk-In Freezer (120/1/16.0 Amp) at each coil.

24. Refer to Section 2.5, ELECTRICAL REQUIREMENTS, for additional information.

**G. Division 27 (Communication) responsible for but not limited to:**

1. Data line coordination for food service equipment.
2. Time clocks.
3. Video cameras for learning assistance in food service areas as required (Provide, Locate, and Install).
4. Edwards 860 Series (Red Lens) surface-mounted Xenon Strobe Beacons within the Kitchen (located above the Freezer) and Cafetorium interconnecting to the Cold Storage Assembly Entrapment Panic Alarm. Coordinate location with Owner. Strobe Beacons to be audible throughout Kitchen and Cafetorium (**Critical**).

**H. Division 28 (Electronic Safety and Security) is responsible for but not limited to:**

1. Security Cameras as required (Provide, Locate, and Install).
2. Interconnection of Entrapment Panic Alarm for Cold Storage Assembly to the main Building Alarm System that will notify the person designated by the Owner that the Entrapment Panic Alarm has been activated (**Critical**).

**I. General Contractor responsible for but not limited to:**

1. Any wall penetration required for food service equipment utilities. Escutcheon plates or S/S sleeves are to be provided and installed as needed.
2. Bulk Freezer Ventilation Pipe (Provide and Install unless otherwise specified).
3. Core drilling for Guide Rails.
4. Refrigeration Roof Curbs / Roof Jack.
5. Interior Bollards – to be epoxy painted per local codes (Provide and Install).
6. Provide and Install ¾" Plywood blocking in the wall for mounting equipment furnished by Section 11 40 00 as required.
7. Cold Storage Assembly Depressions (to be dead level) and sand leveling bed.
8. Structural bracing for Bulk Cold Storage Assembly ceiling panels if required.
9. Menu System Video Monitors in Servery (unless otherwise specified).
10. Structural bracing for Menu System Video Monitors if required.
11. Interior/Exterior refrigeration penetrations and sleeves at building penetrations.
12. DoorScope viewer (peephole) with wide viewing angle at receiving door.

13. Canopy at receiving door. Coordinate height with the height of Receiving Door (8') and the mounting height of Air Screen above the door.
14. Soap and towel dispenser provided by Owner. G.C. is responsible for installation.
15. Washer and Dryer (Provide and Install, unless otherwise specified).
16. Dwarf wall at exposed front/ends of cafeteria serving counters with the finish as selected by the Architect.
17. Final cleaning of all equipment before demonstrations.

## **1.5 QUALITY ASSURANCE**

- A. In addition to complying with all applicable laws, statutes, building codes, and regulations of public authorities, comply with the following:
  1. National Sanitation Foundation (all equipment to bear label)
  2. National Electric Code
  3. Underwriters' Laboratories, Inc. (all applicable equipment to bear label)
  4. American Gas Association Laboratories
  5. National Fire Protection Association
  6. Americans with Disabilities Act
  7. Food and Drug Administration HACCP Guidelines
  8. International Energy Conservation Code (IECC)
  9. Department of Energy
  10. Environmental Protection Agency
- B. Furnish certification of regularly manufactured equipment listing or classification by Underwriter's Laboratories, Inc. with the initial submittal.
- C. Furnish a list of equipment and components (internal and external) that are not of domestic origin. All equipment and components (internal and external) should be of domestic origin when possible. This information should be provided with the initial submittal.
- D. Projects outside the continental United States shall adhere to all local authorities having jurisdiction over that project.

## **1.6 SUBSTITUTIONS**

- A. **Equipment items or components specified are intended to be the Basis of the Bid. All other brands, including any additional names, which may be listed as "Alternates" or "Approved Equal," must conform with the general and item specifications, warranties,**

**size/dimensions, quality, accessories, function, voltage, horsepower, etc. of the first-named brand and be subject to Paragraph C-03 of this Article.**

B. Proposed Substitutions:

1. Submitted at least 14 calendar days before Bid Date.
2. Submit proposed substitutions with catalog data and manufacturer's shop details indicating all modifications required to conform with the specified brand.
3. List of deviations must include equipment name, model number, accessories, and features with deviation(s) noted for specified and proposed alternate equipment. Equipment without listed deviation(s) will be considered furnished as specified.

C. Substitutions with prior approval:

1. Submitted on Bidder's letterhead attached to Proposal Form with individual additive/deductive amounts stipulated and the documentation required in Paragraph B-02.
2. Owner reserves the right to accept or reject any or all substitution proposals before execution of the Contract.
3. Provide all design/engineering services required to adjust in space, systems, utilities, etc., and pay all additional costs of utilities, construction, or professional services that may be incurred due to the acceptance of any substitution.

D. All appliances within a common group or category (e.g., refrigerators, kettles, ovens, etc.): same manufacturer.

## **1.7 INTERPRETATION OF DOCUMENTS**

- A. During Bidding: Bidder's, supplier's, or vendor's questions and comments about Construction Document's clarity or intent will be addressed by addendum.
- B. After Award:
1. Clarification Bulletin will confirm Construction Document requirements.
  2. Request for Information submitted by Contractor shall contain Contractor's proposed resolution.

## **1.8 WARRANTY**

- A. Provide a written warranty for parts and labor for one year from the date of Substantial Completion, including an extended four-year replacement warranty on compressor bodies.
- B. Components of equipment subject to replacement before one year's use (such as refrigerator door gaskets) and those items which may fail due to improper or inadequate periodic maintenance by the Owner/Operator (such as an uncleaned refrigeration system condenser) are not intended to be included within the scope of the Warranty.

- C. Refrigeration Systems/Equipment: One-year free service available within twenty-four hours of notification.
- D. Furnish three copies of a list of all equipment and their respective local service agencies, indicating the address, telephone number, and name of the person to contact. The service agencies selected shall be factory-authorized for the equipment assigned whenever possible.
- E. Provide the following for refrigeration systems/equipment unless specified otherwise:
  - 1. One (1) year of free refrigeration system service is available within twenty-four hours of notification.
  - 2. Provide five (5) year manufacturer's registered written replacement warranty certificate covering compressor bodies. Warranty to cover labor costs for the first year.
  - 3. Provide ten (10) years of the manufacturer's registered written replacement/repair warranty certificate covering cold storage assembly panels. Warranty to cover defects in material and workmanship. Warranty to cover labor costs for the first year.
  - 4. Provide one (1) year parts and labor warranty for all parts of the refrigeration system(s) and cold storage cooler(s) and freezer(s) not otherwise covered herein.
- F. All above-stated warranty periods are from the date of Substantial Completion. All replacement parts due to a warranty call should be the same quality as the original. Replacement parts should be of a domestic origin where possible.

#### **1.9 SUBMITTAL DATA**

- A. Special Requirements: The following are in addition to any general requirements given elsewhere in the Documents.
- B. Submittal Requirements:
  - 1. Kitchen Equipment Contractor to furnish all submittals via PDF, drawings to be scaled per General Specifications and provided in Three (3) submittal packages.
  - 2. Foodservice Design Professionals requires the below-listed business days for each package submitted. Packages are to be submitted within 14 days between each issued package. Each package should contain individual submittal sets.
    - a. Package One to include (2) Individual sets: 10 Business Days for Review
      - i. Equipment rough-in
      - ii. Equipment Brochure
    - b. Package Two to include (3) Individual sets: 10 Business Days for Review
      - i. Exhaust Hoods
      - ii. Cold Storage Assemblies
      - iii. Refrigeration

- c. Package Three to include (4) Individual sets: 15 Business Days for Review
  - i. Custom Fabrication
  - ii. Serving Counters
  - iii. Merchandising Equipment
  - iv. Miscellaneous Submittals
- C. Submittals to be identified with the below-listed file name structure:
  - 1. 11 40 00-1 EQUIPMENT BROCHURE
  - 2. 11 40 00-2 EQUIPMENT ROUGH-IN PLANS
  - 3. 11 40 00-3 CUSTOM FABRICATION
  - 4. 11 40 00-4 SERVING COUNTER
  - 5. 11 40 00-5 EXHAUST HOODS
  - 6. 11 40 00-6 COLD STORAGE ASSEMBLY
  - 7. 11 40 00-7 REFRIGERATION
  - 8. 11 40 00-8 BEVERAGE MERCHANDISER
- D. Package One (1) requires both submittals: Brochure and Rough-in plans. **If not sent together, the submittal will be rejected.**
- E. Foodservice Design Professionals (FDP) will notate all submittals in RED. Architects and General contractors will be notated in color per their direction.
- F. If hard copy submittals are required, Kitchen Equipment Contractor will furnish all copies to the specified trades as required.
- G. If discrepancies, missing information, or incorrect information occur within the documents, Kitchen Equipment Contractor is to seek clarification or note the need for further direction on submittals. The Kitchen Equipment Contractor is to bid the higher of the discrepancies. *Refer to Section 1.3 SCOPE OF WORK: Subsection D.*
- H. Brochure Format (for regularly manufactured equipment and components):
  - 1. Front and rear protective cover with labeled project name.
  - 2. Brochure index: Indicate Functional Area/Room number, item number, quantity, description, and manufacturer.
  - 3. A separate flysheet for each component or item of equipment, indicating item number, name, quantity, manufacturer, optional equipment, modifications, special instructions, and utility requirements. Any equipment or assembly containing more than one buyout sub-assembly or component shall have the second item listed in parenthesis beside the primary item name—for example, Serving Counter (hot food well).

4. Catalog specification sheet with all options notated on the specification sheet and manufacturer's drawing.
- I. Shop Drawings (Rough-In Drawings):
1. Separate drawing sheets: same size as Contract Drawings (Contract Drawings are not to be traced or reproduced). Submittal drawings are to be provided by Kitchen Equipment Contractor and not copied or reproduced from Contract Documents. Any reproduced submittal drawings will be rejected.
  2. 1/4" scale drawing of fixed/movable food service equipment and prefabricated Cold Storage Assemblies with itemized schedules.
  3. Special Conditions Drawings, sizing, and locating the following conditions:
    - a. Slab depressions, cores, sleeves, or block-outs (cold storage assemblies, drain trenches, piping, etc.).
    - b. Concrete or masonry platforms.
    - c. Pipe sleeves or roof jacks.
    - d. Wall openings or block-outs for pass-through equipment, recessed control panels, in-wall fire-protection system components, etc.
    - e. Blocking grounds or anchor plates required in walls for equipment support/attachment.
    - f. Above-ceiling hanger assemblies for support of exhaust hoods, ceiling-mounted pot racks, etc.
    - g. Access panels in walls or ceiling for service of equipment.
    - h. Ceiling pockets or recesses for unusually high equipment.
    - i. In-wall carriers for wall-hung or cantilevered equipment.
  4. Electrical Rough-In Drawing
  5. Plumbing and Mechanical Rough-In Drawing
  6. Required information:
    - a. All fixed and portable food service equipment shown on Contract Drawings.
    - b. All prefabricated Cold Storage Assemblies and Conveyor/Dishtable Assemblies shown on Contract Drawings.
    - c. All general-use and convenience utilities or services indicated on Contract Drawings, including those required by or connected to equipment or devices, not in this Section.
    - d. All Rough-In Drawings: Fully dimensioned from engineering benchmark (column lines, when provided) and finished-room surface to the point of stub-up through



floor and stub-out through wall or ceiling for all mechanical, electrical, and plumbing services.

e. Connection number/tag system and symbols: Identical to Contract Drawings.

J. Shop Drawings (Manufacturer's and Fabricator's):

1. Sheet Size: Identical to Contract Drawings, drawn or plotted at a 1/4" scale for plan view, 1/2" for elevations, and 1 1/2" for sections and construction details.
2. Included information: The item number, name, and quantity.
3. Construction details, sections, and elevations to reflect the requirements of the Specifications and Drawings.
4. Indicate adjacent walls, columns, and equipment.
5. Indicate plumbing and electrical schematic drawings for equipment such as conveyors, waste systems, self-cleaning exhaust hoods, exhaust hood fire protection systems, and fabricated fixtures with a single electrical or plumbing connection.
6. Mechanical or electrical operating components or products integrated into a fabricated fixture: ventilation and service access required or recommended by the manufacturer, including panel size and location to permit easy lubrication, adjustment, or replacement of all moving parts.

K. All equipment and engineering rough-in plans sheet numbers are to match the contract documents. All equipment item numbers and engineer item numbers located on the schedules are to match the contract documents. All engineering requirements must be updated to accommodate the provided equipment and match the contract documents. The Kitchen Contractor coordinates any MEP revisions to accommodate the supplied and proposed equipment. The Kitchen Equipment Contractor is responsible for any costs associated with equipment substitution.

L. Foodservice Design Professionals (FDP) drawings and schedules are not to be copied in any way. Any replicated drawings of Foodservice Design Professionals (FDP) will be rejected.

#### **1.10 SERVICE MANUAL**

- A. Three copies bound in 1 1/2" hardback, three-ring binders (as many volumes as required by the scope of the project) with the same data as the brochure after installation (Refer to "Submittal Data"). Provide separate service manuals for each independent area within the project scope (Main Kitchen, Culinary, Concession, etc.).
- B. Each Volume: Section for maintenance of finish materials (e.g., stainless steel, plastic laminates, FRP, Plexiglas, etc.).
- C. Catalog specification sheet and/or manufacturer's shop drawings.
- D. Each Volume: Index of items, manufacturer's operating/maintenance information, replacement parts data, list of all product warranties, and price lists. Provide the name, title, and address of personnel at each respective manufacturer and service personnel to be contacted for spare/replacement parts and service after the warranty period.

- E. To the extent possible, provide two copies of the manufacturer's video instructional cassettes for operating, maintenance, and equipment service.
- F. Internally subdivide binder contents with permanent page dividers, logically organized by equipment item number or manufacturer name, with tab titling printed under reinforced, laminated plastic tabs.
- G. Electronically submitted manuals must follow the formatting requirements listed above.
- H. **Service Manual to be provided to the owner before kitchen equipment demonstration.**

#### **1.11 VERIFICATION AND COORDINATION OF PROJECT / DATA**

- A. Utilities Rough-in Drawings and field verifications are to be completed within four weeks after receipt of notice-to-proceed. Review Contract Drawings and Submittal Data for accuracy and completeness and notify Architect of conflicts and proposed adjustments. Coordinate work with other sub-contractors.
  - 1. KEC to provide on-site field verification of all underground utilities before pouring concrete for capacity and location and coordinate with General Contractor. Submit a review to Architect and General Contractor. If rough-ins need to be relocated, KEC will compensate other trades for the required relocation.
  - 2. KEC to provide on-site field verification of all other utility connections and locations and coordinate with General Contractor. Submit a review to Architect and General Contractor.
- B. On-Site Inspection Reports
  - 1. Before concrete pour: The Kitchen Equipment Contractor is to submit a copy of the report below to the Architect, General Contractor, and Foodservice Design Professionals (FDP) within 24 hours of the inspection. The form to be submitted is contained within these General Specifications.
  - 2. Before delivery of equipment: The Kitchen Equipment Contractor is to submit a copy of the report below to the Architect, General Contractor, and Foodservice Design Professionals (FDP) within 24 hours of the inspection. The form to be submitted is contained within these General Specifications.



**On - Site Inspection Report**  
**Prior to Concrete Pour**

Inspection Date \_\_\_\_\_ Project Name \_\_\_\_\_  
Project Location \_\_\_\_\_

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Inspector's Name \_\_\_\_\_ Company \_\_\_\_\_  
Inspector's Contact Number \_\_\_\_\_ Email \_\_\_\_\_

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Architectural Firm \_\_\_\_\_ Contact \_\_\_\_\_  
Architect's Contact Number \_\_\_\_\_ Email \_\_\_\_\_

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General Contractor \_\_\_\_\_ PM \_\_\_\_\_  
G.C. Contact Number \_\_\_\_\_ Email \_\_\_\_\_

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Foodservice Consultant Foodservice Design Professionals, LLC PM \_\_\_\_\_  
Contact Number 281.350.2323 Email \_\_\_\_\_

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An on-site Inspection to verify the location of UNDERGROUND utilities was conducted on this date. The following conditions were observed and brought to the attention of the General Contractor. (KEC is to provide a written description and copy of the Utility Plan indicating the corrective action required).

**1. What difficulties, if any, were encountered?**

Inspector's Initials \_\_\_\_\_

**This Inspection Report is the responsibility of the Kitchen Equipment Supplier and the General Contractor. Coordination between the two parties is mandatory.  
Neither the Architect nor FDP need to be present at any of the inspections.**

**EMAIL A COPY OF THIS REPORT AND ANY ADDITIONAL INFORMATION TO THE ARCHITECT,  
GENERAL CONTRACTOR AND FOODSERVICE DESIGN PROFESSIONALS, LLC.**  
FOODSERVICE DESIGN PROFESSIONALS, LLC 114000 - 10  
FOOD SERVICE EQUIPMENT



**On - Site Inspection Report**  
**Prior to Delivery of Equipment**

Inspection Date \_\_\_\_\_ Project Name \_\_\_\_\_  
Project Location \_\_\_\_\_

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Inspector's Name \_\_\_\_\_ Company \_\_\_\_\_  
Inspector's Contact Number \_\_\_\_\_ Email \_\_\_\_\_

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Architectural Firm \_\_\_\_\_ Contact \_\_\_\_\_  
Architect's Contact Number \_\_\_\_\_ Email \_\_\_\_\_

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General Contractor \_\_\_\_\_ PM \_\_\_\_\_  
G.C. Contact Number \_\_\_\_\_ Email \_\_\_\_\_

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Foodservice Consultant Foodservice Design Professionals, LLC PM \_\_\_\_\_  
Contact Number 281.350.2323 Email \_\_\_\_\_

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An on-site Inspection to verify the location of INSTALLED utilities was conducted on this date. The following conditions were observed and brought to the attention of the General Contractor. (KEC is to provide a written description and copy of the Utility Plan indicating the corrective action required).

**1. What difficulties, if any, were encountered?**

Inspector's Initials \_\_\_\_\_

**This Inspection Report is the responsibility of the Kitchen Equipment Supplier and the General Contractor. Coordination between the two parties is mandatory.**  
**Neither the Architect nor FDP need to be present at any of the inspections.**

**EMAIL A COPY OF THIS REPORT AND ANY ADDITIONAL INFORMATION TO THE ARCHITECT,  
GENERAL CONTRACTOR AND FOODSERVICE DESIGN PROFESSIONALS, LLC.**

**FOOD SERVICE EQUIPMENT**

- C. Review critical systems/components for application, performance, and capacity and submit calculation worksheets with the initial submission of brochure/rough-in drawings, with all proposed adjustments noted, including:
  - 1. Exhaust hood removal/supply air volume, velocity, static pressure, duct collar sizes, and locations.
  - 2. Refrigeration Systems (compressor, condenser, and evaporator) capacities/sizes, quantities, and refrigerant piping distances/sizes.
  - 3. Exhaust Hood Fire Suppression Systems (nozzle locations, air handler, fuel interlocks, piping/distance limitations).
  - 4. Locations of Vacuum Breakers.
  - 5. Conformance of Refrigerated Components/Equipment with HACCP Guidelines (e.g., salad/sandwich pans, upright/open refrigerator cabinets, salad bars) with HACCP Guidelines.
  - 6. Gas and water line sizes and manifold configurations.
  - 7. Diameter and length of flexible connector lines for fixed/movable gas appliances.
  - 8. Fabricated Equipment load center panels (individual and total amperage calculations and circuit balance).
  - 9. ADA compliance of workstations, service positions, passageways, etc.
- D. Ceiling mounted appliances/fixtures: Verify and coordinate dimensions/location of support framing/hangers with the General Contractor—all material and installation below 12'-0" AFF: Section 11 40 00.
- E. Dimension Responsibility: Obtain actual or guaranteed measurements for the proper equipment fit. All dimensions indicated in Contract Documents are approximate and are as accurate as can be determined at the time. Field-check all horizontal/vertical measurements and conditions at the building before fabrication or delivery of equipment and notify the Architect of all conflicts or deviations from the dimensions shown.
- F. Checking Dimensions at Site: Before ordering any materials or doing any work, verify all measurements of the building and be responsible for their correctness. No extras will be allowed for variations from drawings in existing conditions or work performed under this contract. Any discrepancies found shall be submitted to the Architect for instructions before proceeding.
- G. Scheduling to Fit Openings: Should it become necessary to schedule the construction of walls or partitions before delivery of fixed equipment, the equipment must be fabricated for passage through finished openings. Maintain close contact with the project and be cognizant of all conditions, including vertical handling limitations within the building (elevator cabs or openings, stairs, etc.) and possible hoisting requirements. Coordinate all procedures with General Contractor and Project Team.

- H. Refrigerated and Dry Storage Areas: Verify and coordinate dimensions to accommodate scheduled modular shelf sections. Notify Architect of the variance between the Contract Documents and actual conditions.
- I. Color/Pattern Selections: Submit selection samples of solid polymer products, plastic laminate, paint or stain finishes, and vinyl-coated surface material of equipment as selected by the Owner.
- J. Movable Equipment Interface: Rolling stock (pan racks, carts, dollies, dish/tray/rack dispensers) required to fit through or into fixed equipment (roll-in refrigerators, counter bodies, etc.) is to be reviewed and coordinated for compatibility at the time initial of shop drawing submittal. Indicate conflicts and proposed adjustments.
- K. Relocation of Work: Relocate or re-route work as required to coordinate related items free of charge if no extra work is involved.
- L. **Kitchen Equipment Contractor must provide FDP with the food service equipment lump sum pricing (including material and labor) after the contract has been executed and before submittals are provided to FDP. This information is critical to FDP for accounting/billing purposes.**

#### **1.12 EQUIPMENT FURNISHED / INSTALLED BY OTHERS**

- A. Obtain and coordinate utility requirements of Owner-Furnished/Owner-Installed (OF/OI) equipment with the building utilities and rough-in drawings/provisions.
- B. Coordinate physical data of OF/OI appliances or equipment and incorporate information into Submittal Drawings. Vendor- or Purveyor-Furnished equipment (e.g., coffee/tea equipment): same as OF/OI.

#### **1.13 WORK INSTALLED BUT FURNISHED BY OTHERS**

- A. Coordinate delivery/installation schedule of Owner-Furnished/Contractor-Installed (OF/CI) equipment with the Owner at least ninety (90) days before equipment requirement.
- B. Obtain and coordinate utility requirements of OF/CI equipment with the building utilities and rough-in drawings/provisions.
- C. Receive at the job site and fully incorporate into installation procedures as if furnished under this Section.

### **PART 2 - PRODUCTS**

#### **2.1 FABRICATED FIXTURES MATERIAL / COMPONENTS**

- A. Stainless steel sheets or shapes: 18-8, Type 302, polished to 180 grit No. 4 finish.
  - 1. Stainless steel joints and seams: Heli-arc welded, free of pits and flaws, ground smooth, and polished to a No. 4 finish.

2. The “grain” direction of horizontal stainless-steel surfaces: Longitudinal, including the splash back. The polishing procedure at right-angle corners of fixtures shall provide a mitered appearance.
- B. Galvanized Iron Sheets: Armco copper bearing Zinc Grip or Zinc Grip/Paint Grip.
  1. Galvanized iron joints and seams: Arc-welded, free of pits, flaws, and ground smooth.
  2. Galvanized sheets or shapes: Washed with mineral spirits and painted with Rust-Oleum gray semi-gloss enamel.
- C. Sound Deadening: Schnee Butyl Sealant ½” wide rope positioned continuously between all frame members or contact material and underside of stainless-steel surface (sinks, tabletops, food wells, over shelves, and undershelves). Tighten stud bolts for maximum compression of sealant and trim excess.
- D. Plastic Laminates: Color/pattern selected by Architect, in 1/16” thickness for flat surfaces; 1/32” thickness for radiused surfaces. Plastic laminates and adhesives must be NSF-approved (Standard No. 35).
- E. Solid Polymer products: Color/pattern/material selected by Architect in thickness as specified. Solid Polymers and adhesives must be N.S.F. approved (Standard No. 51).
- F. Casters:
  1. Fabricated fixtures with “Open Base” construction: Jarvis and Jarvis Model No. 5-405-113P-NSF swivel casters with grease seals on forks and wheels; Zerk fitting in swivel; two casters: Model No. E-75 Verti-Lock brakes. All casters: B-7” rolling bumpers with stainless steel top discs.
- G. Cutting Boards: 1/2” thick Read Products, Inc. “Richlite” cutting board, size as indicated.
- H. Identification Plates, Labels, Tags:
  1. Prohibited Information: Names of suppliers, fabricators, and contractors.
  2. NSF Labels: Required on all pieces of equipment.
  3. Required Information: Function or purpose of controls such as display light switches, food warmer controls, etc.
  4. Plate Construction: Engraved phenolic plastic, secured to equipment with epoxy cement or stainless-steel screws. Furnish samples.

## **2.2 PLUMBING / MECHANICAL REQUIREMENTS**

- A. Plumbing Fittings and Components: Furnished under this Section as follows:

Note: Fitting and components described in Items 1, 2, 3, 4, and 5 are furnished loose by 11 40 00 for final installation and connection by Division 22.

1. Control valves and appliance pressure regulators for water, gas, steam, and vacuum breakers: wherever required on food service equipment (chrome-plated where exposed).
2. Faucets and drains with and without connected overflows (unless otherwise indicated) for all sinks.
3. Specialty food service water-fill faucets, hose bibbs, or hose assemblies indicated in drawings/specifications.
4. Wade Model No. W-10 Shock-Stop shock absorbers for all food service equipment with quick-opening or solenoid-operated water valves.
5. T&S HW-6 Series Water Quick Disconnect hose, diameter per water connection size requirements, with safety fitting, w/coiled restraining device, full port ball valve, antimicrobial coating, lifetime warranty.
6. Extensions of indirect waste fittings to open-sight floor sink or floor drains from sinks, under bar equipment, and food-holding components of serving counters (e.g., cold pans, hot food wells, refrigerator/freezer coils not equipped with condensate evaporators) furnished and installed by Division 22. Drains: All drains to be type 'K' Copper – Paint with aluminum paint where exposed. **Div. 22 to ensure a minimum air gap of 1" and not less than twice the effective opening of the indirect waste pipe, per code. Div. 22 to ensure all drain lines are centered over floor sink grate openings and no water splashes on the floor.**
7. Piping brackets and supports beneath fabricated equipment.
8. Closed Base Bodies: Removable 18-gauge stainless steel closure panel at plumbing penetrations under the top.
9. Control valves on Open Base fixtures: Mounted on a 14-gauge stainless steel gusset-shaped panel with h 3½" setback from the countertop edge/rim to the face of the control handle.
10. Fill hose/faucet at support pedestals or Closed Base Body: Installed in a 15" x 18" x 5" deep recessed mounting panel. Panel bottom: sloped on a 60° angle, with 3/8" stainless steel rod hanger-bracket for the hose.
11. Provide filtration option as shown on contract documents (a, b, c, or combination thereof):
  - a. In-line Water Filter System:
    - i. Everpure System filters for coffee/tea brewers, icemakers, water chillers, convection steamers, and beverage systems. They should be sized per the manufacturer's recommendation.
  - b. Remote Central Water Filter System.
  - c. Remote and/or In-line Reverse Osmosis system.



- B. Gas-Heated Equipment Fittings and Components: Furnished under this Section as follows:
1. Fixed Equipment: T&S Manufacturer Safe-T-Link "HG-4-SK" Series gas appliance connector: Coated Hose w/NPT Male Ends, Swivel Links, 2-Piece Quick Disconnect, 90° Elbow & Installation Kit. Diameter per fuel volume/connection size requirements. Gas valve diameter size per fuel volume/connection size requirements.
    - a. Restraining device: Heavy duty steel cable, fastened to equipment and walls, 3" to 6" shorter than equipment connector length.
- C. Final Plumbing Connections Provisions:
1. Fabricated equipment containing components, fittings, and devices indicated on food service connection drawings to be connected to the building systems: each component, fitting, or group thereof pre-piped to a utility compartment for final connection by Division 22. Refer to drawings for capacities.
  2. Field-assembled equipment (e.g., prefabricated cold storage assemblies, exhaust hoods, ware wash machines, convection ovens, etc.): plumbing components completely interconnected under this Section for final connection arrangements indicated on Utility Connection Drawings.
  3. All plumbing final connection points of equipment shall be tagged, indicating the following:
    - a. Item number
    - b. Name of devices or components
    - c. Type of utility (water, gas, steam, drain, chilled water)
- D. Ducts and Vents:
1. Exhaust hoods furred-in to ceiling: 2" high duct collar for final connection to the duct system.
  2. Warewash machines equipped with integral vent cowls or extended hoods: furnished with 18-gauge stainless steel seamless duct risers to 6" above the finished ceiling for final connection. The duct: trimmed at the ceiling with a 16-gauge stainless steel angle flange with all corners welded.
- E. Refer to Section 1.4: OTHER DIVISIONS/CONTRACTORS RELATED WORK; Sub Sections E. Plumbing and F. Mechanical for additional information.

## **2.3 FOOD SERVICE EQUIPMENT REFRIGERATION SYSTEMS**

- A. Install complete with all refrigerants, oil, dials, dehydrators, gauges, and controls required for the system's proper operation.
- B. Self-contained or factory-installed compressors: Check and adjust to the proper operating temperature prescribed by FDA/HACCP.

## **2.4 PLUMBING TRIM**

- A. Faucets: Furnished for all sinks or equipment requiring open water supply.
- B. Fill Faucets: Furnished for appliances requiring open water supply.
- C. Drain Fittings: Furnished for all sinks or equipment requiring removal of liquids. Install specified chrome-plated or stainless-steel fittings in die-stamped openings with washers and locknuts. The solder may be used as a sealer but shall not be applied to the top surface of the drain fittings.

## **2.5 ELECTRICAL REQUIREMENTS**

- A. All electrical systems, components, and accessories within the work of this Section: Certified to be in accordance with NEC 70.
- B. Electrical Fittings and Components: Furnished under this Section as follows. Coordinate food service equipment loads, voltage, and phase with the building system and confirm any existing or OF/OI equipment requirements.
- C. Cord and Caps:
  - 1. Coordinate all food service equipment cord/caps with related receptacles.
  - 2. All 120, 120/208, and 208 volts “plug-in” equipment shall have Type SO or SJO cord and plug with ground wire fastened to the frame/body of the item.
  - 3. Cord lengths for fixed equipment: Adjusted to eliminate loose-hanging excess.
  - 4. All non-fixed plug-in “buy-out” equipment: Hubbell configuration and ratings as required.
  - 5. All mobile electrical support equipment (heated cabinets, dish carts, etc.) and counter appliances mounted on mobile stands (mixers, food cutters, toasters, coffee makers, microwave ovens, etc.): 8’-0” cord length with cord-hanger strap secured to the rear of equipment or mobile stand.
- D. Switches and Controls:
  - 1. Each motor-driven appliance or electrically heated unit: Equipped with a control switch or starter per Underwriters’ Laboratories, Inc., with low-voltage and overload protection.
  - 2. Disposer controls recess-mounted in the wall: External fittings and accessories removed from the enclosure and furnished with 16-gauge stainless steel perimeter angle flange with welded corners. Install control at 4’-0” AFF to the bottom of the enclosure.
  - 3. Disposer controls recess-mounted in counter-splash risers: External fittings and accessories removed from NEMA 4 enclosure and furnished with 16-gauge stainless steel perimeter angle flange with welded corners. Install control at 3’-0” AFF to the bottom of the enclosure. Provide the panel with a 60” long Seal-Tite electrical conduit from the bottom of the control panel for final field connections under Division 26.

4. Equipment that is not provided with built-in circuit breakers or fused terminal block and is indicated on Utility Connections Drawings to be directly connected to the building electrical system: a NEMA 4 stainless steel disconnect switch furnished and installed by Division 26.
  5. All remote manual starters, disconnect switches, magnetic contactors or starters, and push-button stations: NEMA Type 4 enclosure; NEMA Type 1 enclosure only when installed in a Closed Base Body.
- E. Heating Elements:
1. Electrically heated equipment: Thermostatic controls.
  2. Water heating equipment: Equipped with positive low water shut-off.
- F. Receptacles and Switches:
1. Receptacles installed in vertical panels of support pedestals or Closed Base Bodies: installed in 12" x 8½" x 3" deep recessed mounting panel sloped at a 60° angle and turned up to the top of the opening.
  2. Pre-wire receptacles in closed base fixtures to a junction box installed within 6" from the bottom of utility or compressor compartments.
  3. Receptacles mounted on Open Base fixtures: Installed on a 12" x 10½" x 4½" deep 14-gauge stainless steel panel with returned ends and sloping recess—secure panel to the underframe of fixture top.
  4. Pre-wire receptacles on open base fixtures to a junction box secured to a leg or mounted on the underside of the lower shelf. Vertical runs of wiring: Made in rigid conduit or within the tubular leg.
  5. Receptacles installed in/on-fabricated equipment: Hubbell, Inc. assemblies horizontally mounted in a metal box with stainless steel cover plate.
  6. Switches installed in/on-fabricated equipment: Hubbell, Inc. with metal box and stainless-steel cover plate. Switches: pre-wired to the controlled device and a junction box installed within 6" from the bottom of the utility or compressor compartment. All refrigeration system switches: Installed within the compressor compartment near the door opening.
  7. Load centers installed in/on fabricated equipment to have all fixture components pre-wired to the load center with balanced phase loading. Load center: Ready for final connection by Division 26 and flush-mounted within the utility compartment rear panel, set back 8" from the access door. All breaker/device information will be typewritten on the circuit schedule in the load center door (number corresponding breaker/device) with an enclosed schematic wiring diagram of fixture components.
  8. All receptacles are to be pre-wired to the cord and plug assembly and routed through the over-shelf post at all island equipment locations unless specified otherwise.

G. Light Fixtures:

1. Light fixtures with lamps installed in/on fabricated or field-assembled equipment: pre-wired to a junction box for final connection (continuous-run fixtures when indicated).
2. LED Display Light: Install light fixtures full-length of Display Stand and Serving Shelf with stud bolts and pre-wire through support posts to an apron-mounted switch.
3. Heat Lamps: Installed to the underside of serving shelf assemblies. When multiple 24" heat lamps are specified, provide maximum length heat lamp chassis. Install all switches remotely from lamps.
4. **Cold Storage LED Light Fixtures: Furnished by Section 11 40 00, final installation by Div. 26. All electrical wiring and conduit, provided by Div. 26, electrically connected through the Vapor Proof light fixture base connection, located on the interior door header—all Conduit to be EMT Watertight. Door frame wiring stubs out the top of panels 8" in flexible conduit for final connection by the electrical contractor. All horizontal conduits: below ceiling panels. All lighting fixtures will be wired from inside the assembly—no penetrations through the ceiling panels. Seal-sleeved penetrations are airtight at both sides of the panel. KEC is responsible for verifying that trade contractors seal all penetrations.**

H. Final Electrical Connection Provisions:

1. Fabricated equipment containing electrically operated components or fittings indicated on Utility Connections Drawings: Direct connected, with each component, fitting, or group pre-wired to a junction box for final connection by Division 26. Refer to drawings for circuit loading.
2. Fabricated equipment containing electrically operated components and devices indicated: Circuit-breaker load center with each component or device pre-wired to a separate circuit breaker for balanced phase loading and single final connection by Division 26.
3. Field-assembled equipment (e.g., prefabricated cold storage assemblies, exhaust hoods, ware wash machines, etc.) shall have electrical components completely interconnected in this Section for final connection arrangements as indicated on Utility Connection Drawings by Division 26.
4. Pre-wire the following groups of cold storage assembly electrical devices to a top-mounted junction box for final connection by Division 26 per compartment grouping (unless otherwise indicated).
  - a. Light fixtures and switches; heated pressure-relief ports.
  - b. Door/jamb heaters.
  - c. Evaporator fans, defrost elements and drain line heaters.
5. All electrical final connection points of equipment shall be tagged, indicating the following:

- a. Item number.
  - b. Name of devices on the circuit.
  - c. Total electrical load.
  - d. Voltage and phase.
- I. Lamps: in all food service equipment containing light fixtures. Refrigerator or heated cabinets: All exposed LED lamps above or within a food zone: Shat-R-Shield lamps or standard lamps, sleeved with end caps.
- J. Refer to Section 1.4: OTHER DIVISIONS/CONTRACTORS RELATED WORK; Subsection F. Division 26 (Electrical) for additional information.

## **2.6 CUSTOM – FABRICATED / ASSEMBLED UNITS**

- A. Mechanical or electrical operating components or products integrated into a fabricated fixture: Ventilation and service access required or recommended by the manufacturer. The service access panel(s) size and placement permit easy lubrication, adjustment, or replacement of all moving parts and are to be indicated on fabrication shop drawings.

## **2.7 BAKER TABLETOPS (Unless specified otherwise)**

- A. 14-gauge 304 S/S top with 2" square turn down at the front, 6" high enclosed splash at two (2) sides and rear. Brace same as "Counter/Tabletops."
- B. 1¼" x 6" high integral coved riser at rear and ends unless indicated otherwise on drawings.
- C. 16-gauge stainless steel flour-trough at free long sides, secured to the underside of the top. Trough: 3" diameter with eased edges/corners.

## **2.8 COUNTER / TABLETOPS**

- A. 14-gauge stainless steel; all free edges turned down 2" with ¾" tight hem at the bottom—free corners: rounded on ¾" radius.
- B. Marine edges: Turned up ½" on 45° angle and turned down 2" with ¾" tight hem at the bottom.
- C. Cafeteria serving countertops at hot food stations: Full-length x 3½" x ½" high raised rail at (customer's) front side with 45° integral turndown to counter surface.
- D. Tops abutting high fixtures or walls: Cove up specified height and slope back 1½" at the top on 45° angle; 2½" slope where piping occurs. Turn down 1" at the rear of the splash and tight ends to the bottom of the top turndown. Secure splash turndown to the wall with a 4" long 14-gauge stainless steel "Z" clip anchored to the wall, 36" OC.
- E. Freestanding tables and all serving counter splash-risers: Turned back at a 90° angle with 1" turndown at the rear.

- F. Brace tops with rigid-welded 1½" x 1½" x 1/8" galvanized steel angle frame at the perimeter with cross bracing 2'-0" OC maximum. Provide 4" x 4" x 12-gauge stainless steel triangular pads where leg gusset welds to frame. Paint the entire frame with Rust-Oleum gray semi-gloss enamel. Angle frames: Secured to the underside of top surfaces with ¼" studs welded 9" OC maximum with chrome-plated washer, lock washer, and cap nut. Studs: Such length that cap nuts can be made up tight, bringing the top down snugly on the angle frame eliminating all vibrations or "oil-canning."
- G. Tops: 1½" overhang at free sides of underframe or Closed Base Body.
- H. Mockett Model No. SG5-26 chrome-plated/plastic grommet assembly or integrally welded stainless-steel flange or inverted gusset where service utilities or support posts penetrate or abut tops, ground, and polished to match the top. When conditions permit, provide a 1" x 1½" rectangular backsplash opening for service utilities instead of piercing the horizontal surface. Install stainless steel split tubing at the raw edge of the opening.
- I. Extend underbracing members to the wall, turn down 6", and anchor to the wall when specified to be mounted on leg/bracket assembly.
- J. All openings in tops: 3/16" high raised die-formed edges.
- K. All top openings for pans or inserts: 20-gauge stainless steel, watertight liners, 8½" deep, secured to the underside of the countertop.
- L. All "built-in" and "drop-in" counter equipment/appliances to have framing members at the perimeter of the opening.
- M. Scrap Basket: 18-gauge stainless steel construction 6½" x 6½" x 21¾" long. Top of container: 5/8" wide x ¼" high full perimeter flange with ¼" diameter stainless steel rod bail handle. Interior vertical corners coved on ½" radius. Countertop: Fitted with 6¾" square die-stamped opening.

## **2.9 COLD PANS**

- A. 14-gauge stainless steel with ¾" coved interior welded integrally to the countertop with a 3/16" raised edge at the perimeter of the opening – depth of cold pan to follow NSF 7 compliance.
- B. Slope bottom to required quantity of Component Hardware Model No. E16-4021 drain fittings at 48" OC maximum. Sleeve through insulation at drain fittings and extend common drain line into utility compartment for indirect waste connection.
- C. ½" OD copper refrigerant lines in a serpentine pattern, 1½" OC flattened for maximum contact. Secure tubing to the underside of ¼" thick aluminum "distribution plate" installed tight to the underside of the frost plate area and apply cold-conductive mastic to all surfaces.
- D. Component Hardware Model No. E16-4021 drain fittings at 48" OC maximum, sleeved through the insulation with common drain line extended into utility compartment.
- E. Heat Cable: Low-wattage, full-perimeter, below countertop at the edge of depression. Secure with "Z" clips, 9" OC, and interwire with compressor switch for simultaneous operation.

- F. Enclose the sides and bottom of pans with an airtight 18-gauge galvanized jacket and pack with 2" fiberglass insulation set in mastic.
- G. Compressor: Size as indicated or required to accommodate the size of the cold pan. Locate the compressor in the compartment below the unit or as shown on the drawings.
- H. Sectional 16-gauge stainless steel perforated false bottom ( $\frac{1}{4}$ " holes, @  $\frac{3}{4}$ " OC). Turn down  $1\frac{1}{2}$ " on all sides, weld corners, and provide finger rings. False bottom sections: 24" long maximum.

## **2.10 DRAWERS**

- A. Stainless Steel Liners: Component Hardware Model No. S80-2020 (20" x 20"), easily removable with drawer in the fully extended position.
- B. Drawer Frame: 16-gauge stainless steel flanged out at the top. Weld the frame to a double-panel 16-gauge stainless steel drawer front with full-length recessed pull at the top (similar profile as Garco Model No. R-1060) with closed ends.
- C. Channel-formed horizontal pull:  $\frac{3}{4}$ " turndown at the front and ends with  $\frac{1}{2}$ " tight hem. The front edge of the pull: flush with the face of the drawer. Recess behind pull: sloped up on a 60° angle, terminating 1" below the bottom edge of pull.
- D. Mount drawer frame on Component Hardware Model No. S52-2020 self-closing slides, with Delrin bearings, full-depth of the fixture. Secure slides to the body or brackets to eliminate lateral movement in the extended position. Refrigerator drawers: Component Hardware Model No. S52-2024 stainless steel slides with Delrin bearings.
- E. Drawer enclosure in an Open Base Fixture: 18-gauge stainless steel flanged out at the top for attachment to the underside of the tabletop. The lower edge of the enclosure is flanged in toward the open bottom. Mount drawer slides to enclosure and brace as required. The face of the enclosure is to be the same length and height of the drawer face. Provide  $\frac{3}{4}$ " deep offset in front of the enclosure and  $2\frac{1}{2}$ " from the underside of the tabletop for a flush-fitting appearance.
- F. Drawer enclosure on freestanding fixture: Full depth of table framing.
- G. Drawer enclosure in a Closed Base Fixture: Completely partitioned from the adjoining area. Drawer front: Flush fitting with the face of the body.
- H. Drawer Liners other than tool/utility: Bread Drawer: Component Hardware Model No. S83-2020; Refrigerated Drawer: Component Hardware Model No. S81-1520 stainless steel liner.
- I. Cash Drawer: Integral stainless-steel body, 3" deep.

## **2.11 FOOD WELLS (UNLESS SPECIFIED OTHERWISE)**

- A. Food Warmer Controls: Remote-mounted in sloping recessed apron panel. The control panel is recessed  $2\frac{1}{2}$ " from the bodyline at the top of the 60° slope and 1" at the lower edge. Terminate slope angle  $2\frac{1}{2}$ " below the countertop. Mount panel on concealed piano hinge at bottom edge; secure with screws at upper corners.

- B. Manifold all warmer drains and extend to within the utility compartment for indirect waste connection. Install valve in the drain line and extend handle through compartment door.
- C. Removable 18-gauge stainless steel closure panel at the underside of warmers.
- D. 14-gauge stainless steel plate/utensil shelf full-length of hot food station unless noted otherwise: 10" below countertop x 9" deep, with rear panel coved up to the underside of the countertop; end panels turned up square. Front of shelf: Turned down 1½" and returned under for closure panel attachment.
- E. Food wells: Hatco Model No. HWBIBRT-FULD insulated food warmer (1200 watts, 208 volts, single phase) secured to the underside of 12" x 20" die-stamped countertop openings with thermal breaker mastic rope applied at the perimeter of food well flange.
- F. Soup Warmers: Hatco Model No. HWB-11QTD soup warmer secured to the underside of 11" diameter die stamped countertop opening with thermal breaker mastic rope applied at the perimeter of soup well flange. The maximum allowable temperature of the countertop at the contact surface is: 120°F. Each warmer: Equipped with one 11-quart stainless steel round insert and slotted cover.

## **2.12 SINKS**

- A. 14-gauge stainless steel; all interior corners (horizontal/vertical) coved on ¾" radius. 1½" wide double-walled partitions with flat tops between compartments.
- B. Continuous exterior panels of multiple-compartment sinks: 14-gauge stainless steel filler panel welded ground and polished between compartments.
- C. Sinks (with overflow): Score and slope sink bottom ½" to die-stamped opening fitted with Fisher 22306 twist waste valve 3 1/2" x 2" with overflow and tailpiece. 14-gauge stainless steel bracket: Welded to sink bottom for drain stem with 1½" handle clearance.
- D. Where sinks are installed in fixtures with Closed Base Body, provide a Fisher 22306 twist waste valve 3 1/2" x 2" with overflow and tailpiece. (Sinks with dimensions larger than 20" x 20" in Closed Base Body will not have overflow fitting.) 14-gauge stainless steel bracket: welded to sink bottom with T & S Model No. BL-4740-1 guide bushing. Install on shortened drain stem, one T & S Model No. BL-4710-1 remote control stem assembly only (length as required) with Model No. 113-L universal joint and white blank button. Set drain control handle in Cambro Model PSB-6 bowl with bottom omitted (dress raw edge) to permit passage of drain handle—secure bowl in utility compartment door or body panel with clear silicone.
- E. When single-hole deck-mounted faucets are specified, install overflow fitting in the sidewall of the sink compartment and provide ell-fitting in connecting tubing.
- F. Flush Covers when specified: 1/2" thick Read Products, Inc. "Richlite" cutting board, size as indicated. Support clips: ¼" stainless steel rod 2" long, formed at 45° with two ¾" leg ends (¼" long threaded ends). Insert rod clips through tight-clearance holes in the sink, seal watertight, and secure with stainless steel acorn nuts or tack-weld at the exterior of the sink wall. Set support clips ½" below the top. Provide a 14-gauge stainless steel channel or angle



support frame to store covers when not in use. Cover holder: Adjacent to sink compartment, below countertop, or under drawer assembly.

### **2.13 TRAY SLIDES (UNLESS OTHERWISE SPECIFIED)**

- A. Tray slides: 12" wide, solid 14-gauge stainless steel turned up 2" at the rear behind countertop turndown; turned down 4" at the front and free ends unless otherwise indicated.
- B. Three ¼" high die-formed inverted "V" ridges at 4" OC, 2" from the leading edge, terminating 2" from ends of tray slide with tapered ridge ends.
- C. Ridges formed on radius: Equal-length segments with 2" separation between chords.
- D. Secure tray slides to countertop/body frame, same as "Countertops." Enclose the exposed underside of the tray slide with 18-gauge stainless steel.
- E. When indicated, project tray slides 2" beyond the serving countertop and return the entire width of the serving counter at free ends.
- F. All tray slides are to be provided and mounted per ADA requirements.

### **2.14 DISHTABLES**

- A. Soiled/clean dishtable: 14-gauge stainless steel; free edges coved up 3" with 1½" diameter rolled rim and bullnose corners.
- B. Edge of dishtables next to high fixtures or walls: Coved up 10" and sloped back 1½" on 45° angle; 2½" slope where piping occurs. Turn down 1" at the rear of splash and secure to wall with 4" long 14-gauge stainless steel "Z" clips anchored to the wall, @ 36" OC.
- C. Exposed rear splash: 16-gauge stainless steel finish panel from the top of the splash to the bottom edge of the rolled rim with a welded vertical joint at the end. Secure the panel with concealed attachment and install bracing 24" OC.
- D. Cove all interior corners (horizontal/vertical) on ¾" radius and slope tables 1/8" per foot to sinks, scuppers, or ware wash machines, maintaining level crown/splash.
- E. Brace dishtables with 1" x 4" 12-gauge stainless steel channels down the top centerline and between each pair of legs, with closed ends. Bracing: secured to the underside of the dishtable with ¼" studs welded 6" OC maximum, with chrome-plated washer, lock washer, and cap nut. Studs: such length that the cap nuts can be made up tight, bringing the dishtable down on the channel members, eliminating all vibration and "oil-canning."
- F. Integrally welded stainless steel flange or inverted gusset where service utilities or support posts penetrate or abut tops; ground and polished to match the top.
- G. Hose Bibb: Chicago Model No. 305VBRCF; mounted on 12-gauge stainless steel flange or inverted gusset bracket with 3/8" stainless steel rod hose hanger.

- H. Extend underbracing members to the wall, turn down 6", and anchor to the wall when specified to be mounted on leg/bracket assembly.
- I. Paper-Drop Opening: 9" square with 4" integral chute having hemmed bottom edge. Slope dishtable top 1" toward the opening, forming a 16" square tapered deposit point.
- J. Accessible Tray-Drop Opening: 10" x 18" with integral 16-gauge stainless steel seamless chute sloped at 45° angle toward the center of mobile soak sink position.
- K. All dishtables with a Conveyor Type Dishmachine must have a table limit switch provided by Manufacturer and installed by Division 26. Wiring must be concealed within dishtable fabrication.

## **2.15 DISH / TRAY DEPOSIT ASSEMBLY**

- A. 14-gauge stainless steel deposit shelf, size as indicated. Extend the frame through the opening, flush with the public side of the partition, height as local code authorities require. Turn the shelf down 1" at the front with ¾" return at the bottom (either scribed into a partition or forming reveal). Shelf: 1" square turndown at the long rear side, integral with conveyor slider pan, tray-accumulator, or dishtable. Extend the rear/end splash to align with the head of the deposit station opening. Modify rolled rim at the operator's side of the tray drop window to have a 3" rolled rim.
- B. 18-gauge stainless steel window frame with perimeter flange channel-formed 1" x ¾" at both wall sides. Weld all corners of the frame and install with concealed attachment. Align/about one jamb of the frame with end splash of conveyor slider pan or dishtable whenever adjacent.

## **2.16 UTENSIL – WASH COUNTERS**

- A. 14-gauge stainless steel; all free edges coved up 3" with 1½" diameter rolled rim and bullnose corners.
- B. Edges of utensil-wash counters next to high fixtures or walls: Coved up 10" and sloped back 1½" on 45° angle; 2½" slope where piping occurs. Turn down 1" at the rear of splash and secure backsplash to the wall with 4" long 14-gauge stainless steel "Z" clip anchored to wall @ 36" OC. Vacuum breaker pockets: 4" long square turnback sections aligned with the slope break line.
- C. Exposed Rear Splash: 16-gauge stainless steel finished panel from the top of the splash to the bottom edge of the rolled rim with a welded vertical joint at the end of the splash and ½" turnback at the bottom of the panel. Secure the panel with concealed attachment and install bracing 24" OC.
- D. Cove all interior corners (horizontal/vertical) on ¾" radius and slope tables 1/8" per foot, maintaining level crown.
- E. Brace utensil-wash counters with 1" x 4" 12-gauge stainless steel channels down the centerline of the top and between each pair of legs, with closed ends.

Bracing: Secured to underside of dishtable with ¼" studs welded 6" OC. maximum, with a chrome-plated washer, lock washer, and cap nut. Studs: Such length that the cap nuts can be made up tight, bringing the dishtable down on the channel members, eliminating all vibration and "oil-canning."

- F. Integrally welded stainless steel flange or inverted gusset where service utilities or support posts penetrate or abut tops: ground and polished to match the top.
- G. Extend underbracing members to the wall, turn down 6", and anchor to the wall when specified to be mounted on a leg/bracket assembly.
- H. Hose Bibb: Chicago Model No. 305VBRCF; mounted on 12-gauge stainless steel flange or inverted gusset bracket with 3/8" stainless steel rod hose hanger.

## **2.17 DOORS**

- A. 18-gauge x 1" stainless steel double pan-formed welded construction, insulated with 1" thick polyurethane boards. Seal the perimeter joint of the pans. Offset the lower horizontal framing member of the Closed Base Body to align the flush access door with the bottom of the Body.
- B. Channel-formed full-length horizontal recessed pull: ¾" turndown at the front and ends with ½" tight hem. The front edge of the pull: Flush with the face of the door. Recess behind pull: Sloped up on a 60° angle and terminated 1" below the bottom edge of pull.
- C. Door Hardware
  - 1. Two Component Hardware Model No. M75-1002 stainless steel hinges (notch door/jamb at hinge location).
  - 2. Component Hardware Model No. 35-2000 Concealed Magnetic Catch.
  - 3. Component Hardware Model No. D30-4780 lock in the upper free corner of the door.
- D. Louvered opening: Cut-out opening size as indicated, turn in 1", and weld. All corners: Ground and polished.
  - 1. Full-height 18-gauge stainless steel louver with 1" vanes at 45°, ½" spacing. Perimeter channel-formed frame: 1½" x 1".
  - 2. 45° x 1" x ½" x opening width plus ½" 18-gauge stainless steel louver.
  - 3. Tack the louver flange's weld tab to the door's back panel.
- E. Drain handles opening: 6" diameter hole through the double pan to accommodate Cambro Model No. PSB-6 Bowl:
  - 1. Secure the bowl to the door panel with clear silicone.
  - 2. Omit the bottom of the bowl. Dress raw edges of opening for passage of drain handle.
  - 3. Exposed insulation at the penetration of the door pan: Painted black.

- F. Sliding Doors: fabricate same as Paragraph "A."
  - 1. Aluminum Sliding Door Track: Component Hardware Model No. B57-0000 Series, length as required. Secure to angle frame at the top of the underside.
  - 2. Front/rear door sheaves: Stainless steel  $\frac{3}{4}$ " side-mounted door hangers; two (2) required per door.
  - 3. Recessed Vertical Pull at Upper Corner of Door: Component Hardware Model No. P63-1012.
  - 4. By-Passing Door Guides secured to bottom shelf: Component Hardware Model No. B62-1093.
  - 5. Door Stop at the bottom edge of door: Component Hardware Model No. B60-1086.
- G. Offset the lower horizontal framing member of the Closed Base Body/utility compressor compartment to align the door flush with the bottom of the Body.

## **2.18 CLOSED BASE BODIES**

- A. Frame: Rigid-welded  $1\frac{1}{2}$ " x  $1\frac{1}{2}$ " x  $\frac{1}{8}$ " galvanized steel angle forming a continuous structure around the top and bottom perimeters of the fixture, a post at each corner, studs spaced 48" OC maximum. The top of the frame is cross-braced with  $1\frac{1}{2}$ " angles, 2'-0" OC maximum.
- B. 18-gauge stainless steel panels and trim with concealed attachment. All seams: Welded, ground, and polished.
- C. Exposed Vertical Corners: Rounded on  $\frac{3}{4}$ " radius. Closed Base Bodies adjacent to walls or fixtures: square corners.
- D. Vertical and horizontal channel members at shelf interior or drawer enclosures, such as corners and center mullions: Closed and sealed.
- E. Closed Base Bodies set on finished masonry platforms: closed and caulked at the underside of equipment overhang and bolted to the platform. Body overhang of the platform: 1" at free ends and 2" at the front and exposed rear sides.
- F. Closed Base Bodies not set on the platform: Component Hardware Model No. A54-2-6, 6" legs spaced 4'-0" OC maximum.

## **2.19 COMPRESSOR COMPARTMENTS**

- A. Same material as Closed Base Bodies with back and end partitions; omit bottoms only.
- B. 10-gauge steel slide-out support: Channel frame on full extension slides with 125 lb. minimum capacity secured to fixture frame with anti-vibration mountings for maximum sound deadening. Closed Base Body on the solid platform: front-to-back slide-out support channels set 4" above the bottom for air circulation.

- C. Access Door: 18-gauge stainless steel double-pan type with a channel formed horizontal recessed pull full length of the top (similar profile as Garco Model No. R-1060) with closed ends. Channel-formed horizontal pull:  $\frac{3}{4}$ " turndown at front and face of the door. Recess behind pull slopes up on a 60° angle, terminating 1" below the bottom edge of pull. Offset the lower horizontal framing member of the Closed Base Body to align the flush access door with the bottom of the body.

Door hardware: two Component Hardware Model No. M75-1002 stainless steel hinges (notch door/jamb at hinge locations) and Component Hardware Model No. 35-2000 concealed magnetic catch.

- D. Access Doors Louver: Full-height, with  $1\frac{1}{2}$ " x 1" x 18-gauge stainless steel channel-formed frame with welded corners. 18-gauge stainless steel louver. Submit a sample of the design for approval.

## **2.20 UTILITY COMPARTMENTS**

- A. Closed Base Bodies or Pedestal Supports: Fitted with utility compartments wherever piping or wiring is required in/on the fixture.
- B. Same material as Closed Base Bodies with full-height back and end partitions. Omit bottoms except at hose-reel locations.
- C. Access Doors: 18-gauge stainless steel double-pan type with a channel formed horizontal recessed pull full-length of the top (similar profile to Garco Model No. R-1060) with closed ends. Channel-formed horizontal pull:  $\frac{3}{4}$ " turn down at the front of the door, a recess behind the pull slopes up on a 60° angle, terminating 1" below the bottom edge of the pull. Offset the lower horizontal framing member of the Closed Base Fixture to permit flush alignment of the door with the face and bottom edge of the body. Door hardware: two Component Hardware Model No. M75-1002 stainless steel hinges (notch door/jamb at hinge locations) and one Component Hardware Model No. 35-2000 concealed magnetic catch.
- D. No shelves of Closed Base Fixtures are to be penetrated.

## **2.21 UTENSIL RACKS**

- A. Rack:  $\frac{1}{4}$ " x 2" 300 series stainless steel flat bar with No. 4 finish, fully welded and formed to match the shape shown on drawings. Lowest band - 7'-6" AFF unless otherwise indicated.
- B. Ceiling Mount Supports 1-5/8" diameter 16-gauge stainless steel tubing from band to 18" above the ceiling. Anti-sway bracing above the ceiling -  $1\frac{1}{2}$ " Unistrut members. Tubing penetrations at the ceiling - Component Hardware Model No. A16-0206 stainless steel gussets.
- C. Table Mount Supports 1-5/8" diameter 16-gauge stainless steel tubing extended thru countertop. Secure to closed base framing or cross rail/undershelf on the open base fixture. Tubing penetrations of countertops - integrally welded stainless steel inverted gusset.

- D. Utensil Rack Hooks - Component Hardware Model No. J77-4401 stainless steel hooks spaced 8" OC maximum.
- E. Electrical Receptacle: NEMA No. 5-20-R or as noted. Mount in fully welded 3½" x 5½" x 3" 14-gauge stainless steel enclosure with ½" radius corners. Stainless steel cover plate to fit specified receptacle. Pre-wire thru tubular support for final connection above the ceiling by Division 26.

## **2.22 CASHIER / SERVING COUNTERS**

- A. Exterior Body Panels, when specified: ¾" thick marine grade hardwood plywood with plastic laminate or solid polymer in Architect's selection of color/pattern at all exposed surfaces; backing sheet where concealed.
- B. Position, size, and finish horizontal or vertical reveal as Architect directs.
- C. Secure panels to counter body framing in a concealed manner. Install removable panels with "Z" clips overlapping body framing members.
- D. Hinged doors in exterior body panel(s) - Grass Model No. 1200VZ or 1200VZ8 self-closing hinges. Three (3) required per door; Grass Model No. G/HRZ base plate at each hinge; Ives Model No. TM820 concealed push latch at each door. Confirm Model No. and provide samples with the submittal.
- E. Cashier counter to have 16-gauge s/s intermediate shelf, turned down 1 1/2" with tight hem at front. Cove up 2" at rear and sides. Brace undershelf with 1" x 4" 14-gauge stainless steel channel at the longitudinal centerline. Provide an outlet for power/data within the body above the intermediate shelf. Provide cash drawer inserts per district standards.
- F. Sneeze Guards to be adjustable and meet NSF standards.

## **2.23 OPEN BASE STRUCTURES**

- A. 1-5/8" OD x 16-gauge seamless stainless-steel tubing legs beveled at the bottom. 1¼" OD cross rails fully welded (360° smooth and polished) to legs at 10" AFF, OC.
- B. Top of Leg: Inserted in Component Hardware Model No. A20-0206 gusset fully welded to table frame or sink bottom.
- C. Bullet Foot: Component Hardware Model No. A10-0851.
- D. Freestanding fixtures requiring utility connections: Component Hardware Model No. A10-0854 flanged feet at the fixture corners, anchored to the floor with non-corrosive bolts.

- E. Table Bases: Maximum leg spacing of 6'-0" OC; dishtable and utensil wash counter bases at 5'-0" OC.
- F. Open Base equipment specified to be supported by brackets at the rear side only (not completely cantilevered): Tubular legs at the front side only with Component Hardware Model No. A10-0854 flanged feet anchored to the floor with non-corrosive bolts. Front-to-back cross rail: fitted into Component Hardware Model No. A20-0406 circular gusset secured to the wall with non-corrosive bolts.

## **2.24 UNDER SHELVES**

- A. Open Base Structures: 16-gauge stainless steel turned down 1½" with tight hem at the bottom. Notch all corners to fit tubular legs and weld from the underside to fill the gap, grind, and polish. Cove up 2" at the rear or ends adjacent to wall, columns, refrigerators, etc. The turn-up at freestanding fixtures is to be hemmed tight to the bottom of the turndown. Brace undershelf with 1" x 4" 14-gauge stainless steel channel at the longitudinal centerline and each intermediate pair of legs.
- B. Open Base Structure specified to be supported by brackets at the rear side only (not completely cantilevered): 16-gauge stainless steel turned down 1 ½" at free sides with tight hem at the bottom edge. Notch all corners to fit tubular legs as required and weld from the underside to fill the gap, grind, and polish. Cove up 2" at rear ends, as indicated. Fill the gap at the front-to-back rail, grind, and polish. Brace undershelf with 1" x 4" x 1" 14-gauge stainless steel channel at longitudinal centerline between front to back rails.
- C. Closed Base Fixtures: 16-gauge stainless steel turned down 1½" at front. Front edge of bottom shelf: Turned back and sealed to finished masonry platform or boxed for leg application. Center shelf has ¾" tight hem.
  - 1. Shelves: Turn up square at ends (coved up at rear only) to the shelf above or countertop flanged out for attachment with no open spaces at interior.
  - 2. All shelf partitions at exposed ends of cabinet bodies or interiors: Free of exposed framing members.
  - 3. Reinforce shelves with full-length 1" x 4" x 14-gauge stainless steel closed hat channel.
  - 4. Unless otherwise noted, all closed base undershelves must be 22" deep and clear.
  - 5. Fully weld smooth and polish the vertical seam of the shelf turndown/turn up with the face of the body partition.
  - 6. Seal the vertical seam of the square turn-in at the exposed interior of open shelf sections.

## **2.25 ANCHOR PLATES / WOOD GROUNDS**

- A. Behind the finished surface, wherever building walls, partitions, or ceiling construction will not accommodate direct attachment of equipment such as over shelves, wall cabinets, hose reels, utensil racks, exhaust hoods, display cases, etc. Material and installation by General Contractor. Location and coordination with trades by Section 11 40 00.

- B. Anchor Plates: Not less than 12" x 12" x ¼" thick steel, secured to the structure above or behind the finished surface, positioned at attachment points.
- C. Wood Grounds: Length required by fixture, component, or device, 24" wide x ¾" thick plywood secured to partition system before gypsum board installation.
- D. Above ceiling supports: Structural shapes (4" x 8.0 lb. channel) suspended from the structure. Maximum height 15'-0" AFF. Size: width of equipment x length of equipment plus 6'-0". Cross bracing at 6'-0" OC maximum.

## **2.26 OVER SHELVES**

- A. 16-gauge stainless steel with free edges turned down 1" with ½" tight hem at the bottom—¾" radius at free corners.
- B. Turn up 2" raw at walls and sides with a horizontal coved corner at the rear. Round front corners of turn up on ¾" radius.
- C. Where shelf width exceeds 12" width, reinforce with ½" x 4" x 14-gauge stainless steel closed hat channel full-length of the shelf.
- D. Wall-Mounted Shelves: 16-gauge stainless steel brackets 48" OC maximum, set in 6" from ends.
- E. Freestanding Shelves: Where splash is required at free over shelves, turn up square 2" at ends, cove up at the rear, and hem tight to lower edge of front turndown. Weld exposed corners.
  - 1. Freestanding over shelves: 16-gauge stainless steel cantilevered brackets at the rear of the table; double-cantilevered brackets at the center of the table. Posts for cantilevered over shelves are 1-5/8" OD x 16-gauge stainless steel secured to the underframe, 4'-0" OC. Ends of shelves: Secured to adjacent wall/fixture or mounted on 1¼" diameter stainless steel posts.
  - 2. Freestanding over shelves not on cantilevered brackets: 1¼" OD x 16-gauge stainless steel posts, each pair at 4'-0" OC maximum.
- F. Baker Table Over shelves: Supported 18" above the top with 1¼" OD stainless steel tubular supports with channel shoe secured to risers.
- G. Glass/Cup Rack Over shelf at Dishtables: 14-gauge stainless steel with 1½" deep "vee" trough at free long sides with 1" tight hem inside the trough. Provide a ½" marine edge at free ends and; a 4" splash at the wall. Suspend shelf at 18" above dishtable surface on posts/brackets anchored to dishtable frame/wall at rear; 1" OD stainless steel tubing supports from the structure above the ceiling at front edge, 60" OC at each end.
  - 1. Install at both ends a ½" stainless steel drain tube (connecting both vee-troughs) extended to the dishtable surface through splash turnback.



2. Rack-rest: horizontal full-length 1-5/8" OD stainless steel tubing supported at 10" OC above shelf (8" OC for double service shelf) by 1 1/4" OD stainless steel tubing with closed ends. Support tubing: welded, ground, and polished, spaced 60" OC.
3. Rack-rest supports to wall: 4" x 4" x 10-gauge stainless steel flange plates welded to support tubing. Anchor flanged plates to blocking ground with non-corrosive bolts.

## **2.27 DRAIN TRENCH LINER / GRATING**

- A. Liners: 14-gauge stainless steel in sizes as indicated.
- B. Interior of liners: 6" deep with all interior corners (horizontal/vertical) coved on 3/4" radius; sloped and scored 1" to integrally welded Component Hardware Model No. D34-Y011 basket drain assemblies @ 48" OC, fitted with 6" long welded tailpiece. Stainless steel safety chain: connected to basket strainer assembly and top of liner wall.
- C. Liners: 1" wide perimeter shoulder at the top, turned up flush with finished floor, tight hemmed back down to the shoulder level, and flanged out 2" for attachment to the slab.
- D. Underside of sloping liner portion: 2" long "Z" clips.
- E. Grating: IMC-TEDDY PFD-ADA removable fiberglass grating:
  1. 1" deep "I" bearing bars with 0.6" wide top flange.
  2. Full perimeter frame, section quantities, and sizes indicated.
  3. Maximum of 2'-0" sections.
  4. Grating bars should be spaced 0.4" apart per ADA requirements.
  5. Grating to be two (2) equal sizes.

## **2.28 WALL PANELS**

- A. Wall Panels: 18-gauge stainless steel, double pan-formed 1/2" thick with internal stiffener members. Fill with USDA-approved thermal insulation, full height, and width of panels, and attach to the interior with mastic. The maximum allowable temperature at the rear side of the panel: is 120°F.
  1. Height of panels as required: Top of tile base to the underside of the hood, top of tile base to the top cap of stub wall, or top of splash to the underside of the hood.
  2. Level and square lower edge and sides.
  3. Butt joints on all panels.

## **2.29 EXHAUST HOODS (SURFACE-MOUNTED CONDENSATE)**

- A. Hoods: Size/shape as indicated: 18" high on the interior.

- B. Body: 16-gauge stainless steel, with all seams welded, ground, and polished.
- C. Continuous condensate trough at perimeter: 3" x 1".
- D. Frame the top of the hood with 1½" angle iron assembly and suspend from the structure above the ceiling by ½" diameter steel rods, drawn tight against the finished ceiling surface.
- E. Duct opening/collar as specified with stainless steel louvered grille over the opening.
- F. Div. 22 to extend drain line to floor sink when shown. The drain line is to be silver painted. Div. 22 to ensure all drain lines are centered over floor sink grate openings and no water splashes on the floor.
- G. ½" diameter steel hanger rods at 4'-0" OC maximum to be by Kitchen Equipment Contractor, but they are to be anchored to the supporting structure (or slab) by the General Contractor in the locations required by exhaust hood shop detail.
- H. Hoods and components to meet all NSF standards, NFPA 96, UL 710 and current IECC requirements.

### **2.30 EXHAUST HOODS (UNLESS SPECIFIED OTHERWISE)**

- A. Exhaust to be provided to meet all current local jurisdiction mechanical and energy code requirements. Kitchen Equipment Contractor to verify code requirements and coordinate with Divisions 23 and 26. Hoods over production equipment to be Type 1 with continuous capture. All Type 1 hoods should be 6' deep to ensure smoke/steam capture unless otherwise noted.
- B. Install fire suppression system(s) in all ventilators specified in this section. Install per the manufacturer's recommendations and applicable codes or standards. Submit installation certification form to Architect.
- C. Locate chemical cylinders as indicated on drawings and install piping to exhaust hood(s) in a concealed manner. Set cylinders and cabinets at 7'-0" clear AFF unless noted otherwise. Provide polished chrome plated tubing piping/fittings, where exposed at cylinder location and at the interior of exhaust ventilator—exposed pipe threads in/above the food zone are not allowed. Submit a schematic installation diagram and confirm critical distances from cylinders to nozzles.
- D. Remote manual release located in the path of egress from the protected exhaust hood area. Kitchen Equipment Contractor to coordinate location with local Fire Marshal requirements before submittal review. All conduits will be recessed within the wall; SURFACE MOUNTING WILL NOT BE ACCEPTED.
- E. Provide one (1) handheld Type 'K' and ABC 6-liter fire extinguisher per Ansul system, surface wall mounted.
- F. Required quantity and sizes of mechanically operated gas valves.

- G. Confirm interconnection of all equipment as required to ensure exhaust hood and fire suppression systems are entirely operational and meet local jurisdiction code requirements.
- H. ½" diameter steel hanger rods at 4'-0" OC maximum to be by Kitchen Equipment Contractor, but they are to be anchored to the supporting structure (or slab) by the General Contractor in the locations required by exhaust hood shop detail.
- I. Provide an appropriate quantity of fire suppression systems as required by local jurisdiction code requirements.
- J. Double wall insulated construction at ends. S/S where exposed.
- K. Hoods and components to meet all NSF standards, NFPA 96, UL 710 and current IECC requirements.
- L. Refer to Section 1.4: OTHER DIVISIONS/CONTRACTORS RELATED WORK; Subsection E. Division 23 (Mechanical) for additional information.

### **2.31 HIGHLIGHTING**

- A. Polish the following vertical surfaces to a No. 8 finish:
  - 1. Serving and display shelf turndowns.
  - 2. Conveyor and dish/tray deposit station turndowns/frame.
  - 3. Tray slide turndowns.

### **2.32 SHOP / FIELD JOINTS**

- A. Field joints: The least number is used only when equipment size must be limited for building or interior space access.
- B. Stainless steel tops (including edges and splashes): Fully welded, ground, and polished to match adjacent surfaces.
- C. Vertical field joints of fixture backsplashes that are inaccessible from the back: terminate 1" above the horizontal coved corner. The remaining height of the field joint: hairline butt joint with offset draw-angle behind. All horizontal/vertical draw joints: located and noted on shop drawings.
- D. Hairline butt joint: 1½" x 1½" x 1/8" steel angles welded to the back/underside of countertop/shelf. Offset angle beyond joining metal edge ½" (min.) to provide a flat backing surface for a joint with the angle of other joining metal edge, set for ½" space between vertical legs of angles. Bolt sections together with 5/16" machine bolts, lock washers, acorn head cap nuts, set 3" OC.
- E. Closed Base Bodies: Draw-type with hairline seam fully field-welded.
- F. Millwork: Plastic laminated joints shall be dowelled, glued, and draw-bolted with fasteners.

- G. Solid Polymer: Surfaces drawn tight, filled, sanded, and finished to match adjacent surfaces.

## **2.33 PREFABRICATED COLD STORAGE ASSEMBLIES**

- A. Assembly to be installed by Factory Authorized Installers only.
- B. KEC to provide a 1-year cold storage assembly panel installation warranty. Panel installation warranty to cover labor and part replacement issues resulting from a failure to complete the following during installation:
1. Cold Storage Assembly panels to be installed square, plumb, and level.
  2. To create a proper seal, ceiling panels must be installed flush and tight to wall panels with undamaged gasket material. Any signs of condensation at joints or assembly walls should be reported to FDP and addressed immediately. Caulk at panel seams will not be an acceptable solution.
  3. All cam-locks should be engaged and cam-lock covers in place.
  4. Any gaps under the floor angle (due to shimming) must be entirely sealed to the slab.
  5. All penetrations in the ceiling or wall panels should be insulated and sealed by appropriate trade contractors and verified by KEC, including but not limited to Light Fixtures, Refrigeration Lines, Sprinklers, Temperature Sensors, etc.
  6. Proper installation of the door systems should allow the door to self-close and seal around the perimeter of the door opening and at the floor threshold.
  7. Final operation of the IC/IC+ control, door heaters, and light switches should be confirmed upon completion of the electrical connections.
  8. The cold storage assembly panel installation warranty will cover service issues resulting from faulty installation.
- C. **KEC is responsible for overall install accuracy/quality and quality control of work performed regardless of installer or any field modifications due to building/construction conditions.**
- KEC is to provide a Letter of Install Approval to Foodservice Design Professionals (FDP) upon completed installation, verifying that all items above have been inspected by the KEC for completeness and installed per manufacturer requirements. This letter will be required as part of the completion of the contract.**
- D. Sectional Assemblies: Size/shape indicated on drawings; 9' AFF unless otherwise specified. Door locations/size: exactly as shown.
- E. Sandwich Panel Insulation: Class 1 Urethane with a vapor barrier, 4" thickness with mature "U" factor of .030 or lower.
- F. Wherever compartment dimension exceeds the clear-span ability of ceiling panels, provide I-beam support on the exterior of the ceiling or spline-hangers. Install ½" diameter steel rods

through beams/hangers and secure them to the structure above. Beams or posts within compartments are not acceptable.

- G. Reinforce prefabricated wall panels to rigidly support the door assemblies—all door jambs are furnished with replaceable full-perimeter thermostatically controlled heater cables. Install 2" x 4" 16-gauge stainless steel hat-channel full-width of the jamb with 1/8" stainless steel removable flush sill, secured with stainless steel screws and sealed watertight to channel.
- H. Provide an aluminum cove base at the interior and exterior of exposed panels for all floor assemblies.
- I. Floor Installations:
  - 1. **4" Recessed Exposed Factory Floor Installation (if required):**
    - a. Six mil polyethylene sheets in slab recess with all joints lapped 6 inches and sealed to form a watertight seal.
    - b. Level and square prefabricated perimeter and partition wall panels anchored to slab recess. Protect the exposed surface of panels.
    - c. 4" commercial grade manufacturer's dura floor with diamond treadplate surface and marine grade plywood subfloor.
    - d. 15# felt slip sheet over insulation with 6" lapped joints flashed up the height of the finished floor base.
    - e. 1/2" sand leveling bed by G.C.
  - 2. **8-1/2" Recessed Floor Installation (if required):**
    - a. Six mil polyethylene sheets in slab recess with all joints lapped 6 inches and sealed to form a watertight seal.
    - b. Level and square prefabricated perimeter and partition wall panels anchored to slab recess. Protect the exposed surface of panels.
    - c. 4" manufacturer's floor.
    - d. 15# felt slip sheet over insulation with 6" lapped joints flashed up the height of the finished floor base.
    - e. 1/2" sand leveling bed by G.C.
    - f. Concrete flooring and tile over insulation by Divisions 03/09.
  - 3. **12" Recessed Floor Installation (if required):**
    - a. Six mil polyethylene sheets in slab recess with all joints lapped 6 inches and sealed to form a watertight seal.

- b. Level and square prefabricated perimeter and partition wall panels anchored to slab recess. Protect the exposed surface of panels.
  - c. 4" manufacturer's floor.
  - d. 15# felt slip sheet over insulation with 6" lapped joints flashed up the height of the finished floor base.
  - e. 1/2" sand leveling bed by G.C.
  - f. Concrete flooring over insulation by Division 03:
    - i. Concrete mix: 5000 psi @ Freezers and 3000 psi @ Coolers.
    - ii. No limestone or fly ash; fiberglass reinforced.
    - iii. #3 rebar, set on 12" centers in both directions.
    - iv. Center rebar vertically in wearing bed.
    - v. 10" high concrete 45° angled wall curb at interior perimeter per food service details.
  - g. Diamond treadplate wall panels on the interior and exposed exterior by 11 40 00. Refer to drawings for height. Coordinate diamond treadplate wall covering at the interior with angled wall curb.
  - h. Ventilation Pipe Requirements by G.C.:
    - i. Bottom perforated vent pipes to be #40 PVC on six ft. max centers open on both ends with the thermostatically controlled fan on (1) end and perforated mesh on the opposite end of the fan at the exterior of the building.
    - ii. Vent pipes to turn parallel with exterior wall - 180° turn down.
    - iii. Vent pipe openings to be held at 24" above grade or roof per design.
    - iv. Fans to be Grainger Manufacturer and sized per airflow needs. Airflow is to be sized based on the length and number of bends.
    - v. If no exterior wall is adjacent, vent pipes will route up and extend past the roof. Roof penetrations by Division 07.
4. **Surface Mounted Factory Floor Installation (if required):**
- a. 4" commercial grade manufacturer's dura floor with diamond treadplate surface and marine grade plywood subfloor.
  - b. 36" reinforced diamond treadplate internal ramp.

- c. 10-gauge stainless steel threshold to provide a smooth transition to the interior cold storage assembly floor.
- J. Modularm Model No. 75LC (unless otherwise specified) temperature monitor/alarm with sensor and probe-cord length required to extend from the exterior front of the assembly to a mounting position of the sensor within the evaporator return airstream. The system is to be interconnected to the building's alarm system (by Division 27) and to notify facility personnel of the district/owner choosing when activated.
- K. Modularm Model No. IP-1 (unless otherwise specified) Illuminated Push Button and Entrapment Alarm interconnected to Edwards 860 Series Strobe Beacons (Strobes by Div. 26) in Kitchen above freezer and in Cafetorium. The system is to be interconnected to the building's alarm system (by Division 27) and to notify facility personnel of the district/owner choosing when activated.
- L. Cooper Atkins Temp Track smart system (unless otherwise specified) for hospital applications. Confirm all component model numbers for complete installation and operation.
- M. LED surface-mounted light fixture, in quantity/arrangement shown on drawings—light fixtures to be perpendicular to coils. Light fixtures wired to interior and exterior temperature control panel. Light fixtures are to be provided by Section 11 40 00 and installed by Division 26. Division 26 is to seal all conduit penetrations at light fixtures. KEC to verify that penetrations are sealed.
- N. Penetrations of Panels: To be sealed by factory installer and appropriate trade contractors, with Dow Corning 3-6548 silicone RTV foam, total depth of the panel. Trim excess flush. KEC to verify that all penetrations are sealed.
- O. Install closure panels and trim strips to building walls and ceiling with concealed attachment. Closure material: same as wall panels unless noted otherwise.
- P. Compartment Entrance Doors: 36" x 78" nominal clearance unless otherwise noted.
  - 1. Mount hinged doors on two Kason Model No. 1346; polished chrome-plated nylon cam-lift hinges.
  - 2. Hinge doors as indicated on drawings.
  - 3. Defrost heater: Thermostatically controlled and replaceable at the entire perimeter of all doors, except when using clear Lexan doors (in addition to door jambs). Defrost heaters to be wired for continuous service.
  - 4. 36" high x full-length diamond aluminum treadplate at front and rear of all hinged doors.
  - 5. 12" x 2" engraved phenolic plastic compartment identification sign in Architect's color selection with 1" letters, mounted above door window.
  - 6. 14" x 24" four-panel glass view window with heater and molded non-metallic inner and outer frame. The heater is to be wired for continuous service.

7. Padlock/key provisions in the door latch with safety release mechanisms as listed below.
  8. Kason 1826 Intelli-Vent LED Heated Pressure Relief Ports with Dual Port Vent and Security Light. Locate One (1) 12" below ceiling on cooler/freezer common wall panel and One (1) 12" below ceiling on cooler wall panel. If Cooler and Freezer are separate units, locate one on the freezer wall panel as well, 12" below ceiling and mounted in the door frame assembly. All ports to have separate dedicated electrical connections and be wired for continuous service.
  9. Kason Model No. 0487 (unless specified otherwise) Frost Free inside release with fiberglass rod and plastic flange with safety flow plastic knob – ADA compliant.
  10. Manual backup vacuum release mechanism to punch hole in wall assembly to release vacuum within freezer assembly. Mechanism to include a pull-down handle with freeze-proof hand grip. Handle to have the ability to penetrate and/or punch hole in wall accordingly to assist with opening of door assembly in the event of entrapment (and failure of frost free inside release button). Wall panel to include knock-out section to assist with requirements. Release mechanism assembly to be built-in/mounted to the door assembly structural frame to minimize mechanism tear-out and/or failure. Handle to be painted yellow with phenolic label "Vacuum Pressure Release."
- Q. Provide refrigeration calculations and refrigeration alarm to meet local jurisdiction code requirements.
- R. If air screens or air shields are specified above doors or on the interior of the assembly, the manufacturer must provide adequate blocking in panels to support these components and pre-wired electrical connections. Installer to coordinate location of door closure to not interfere with air screens or air shields. Clear-VU swinging door assemblies are not required if air shields are specified.
- S. S/S trim above cold storage assembly to conceal manufacturers ceiling grid.
- T. Field-check all horizontal/vertical measurements and conditions at the building before fabrication or delivery of equipment.
- U. Cold Storage Assemblies to be installed by the PRE-APPROVED INSTALLERS listed below:
1. QBR Refrigeration, 30083 Hwy 90 Blvd., Katy, TX 77493, Mr. Andy Spellins, 713-973-2875, [andy.spellins@qbrsales.com](mailto:andy.spellins@qbrsales.com)
  2. Machine Ice, 8915 Sweetwater Ln., Houston, TX 77037, Mr. Will Weaver, 281-448-7823
  3. Coolers Inc., 6922 Alder Dr., Houston, TX 77081, Mr. Lee Mamone, 713-665-8886

## **2.34 COLD STORAGE REFRIGERATION SYSTEMS**

- A. Unit Coolers: specified quantity and model, ceiling-hung by ½" OD nylon bolts with stainless steel washers and nuts. Insert hanger bolts through the plastic sleeve and seal penetration airtight.



1. Unit cooler drain fittings: positioned as indicated on drawings. Installation of cast tee-fittings on drain pan outlet with union and cleanout plug and extension of 1" Type K copper drain line through wall panel to air-gap fitting or floor drain under this Section.
  2. Slope drain line ½" per foot, trap at the exterior of assembly and turn down into the drain. Manifold drain lines of adjacent compartments wherever possible.
  3. Install drain line plastic sleeve through compartment wall, seal around drain line, and install stainless steel escutcheon with setscrews.
  4. Electric drain line heater cable (self-regulating 7 watts): on all unit coolers operating below 36°F., installed from coil drain line fitting to wall penetration under this Section. Heater cables: the minimum rating of 15 watts/lineal foot, 208 volts, single phase. Wrap drain line with maximum 2" loop spacing and interwire to unit cooler for continuous operation.
  5. Mounted, pre-piped, and pre-wired evaporator components:
    - a. Sporlan thermostatic expansion valve with external equalizer.
    - b. Shut-off valve at evaporator suction and liquid lines.
    - c. Sporlan "Catch-All" refrigerant filter/dehydrator on liquid line.
    - d. White Rogers 1609-101 adjustable thermostat with remote bulb positioned in return airstream of the evaporator.
    - e. Electrical disconnect switch in NEMA 4 enclosure.
    - f. **For any facility within 20 miles of a salt air environment:** Condenser and Evaporators to be built with Electrofin coating to retard salt air deterioration. Coils are to be coated with Technicoat 10-2 coating for protection against a salt air environment.
  6. Two (2) fan door activation switches to turn off evaporator coils when the door is opened.
- B. Refrigerant System Installation:
1. Refrigerant Lines; Type "L" rigid copper tubing. Fittings: Wrought copper or brass designed for use with high-temperature solder. Piping joints: Made with silver solder (Sil-Fos). Piping: Properly suspended from and anchored to the structure with adjustable hangers 6' OC maximum. Suction lines: Sized to have a maximum pressure drop of two pounds in medium-temperature systems; one pound in low-temperature systems. Liquid lines: Sized to give maximum pressure to prevent trapping of oil. Insulation on all suction lines: Armaflex insulation by Armstrong. ¾" thick at medium-temp 1" thick at low temp. Refrigerant lines in PVC conduit: Sealed at both ends with Dow Corning 3-6548 silicone RTV foam. The refrigeration system installer will wrap Exterior Refrigerant Lines in the self-fastening jacket of Type 3003-H14 aluminum alloy 0.016-inch thick. Provide aluminum strapping and seals for applying aluminum jackets

and covers according to the manufacturer's recommendations for a completely weather-tight covering.

C. Evacuation and Charging:

1. After completion of the pressure test, the system shall be evacuated using an approved auxiliary vacuum pump. Connections for evacuation: Following the manufacturer's recommendations.
2. Charging after the initial charge, which is contained in the condensing unit (R448A Non-CFC Ozone Depletion Refrigerant for medium and high temp units, R513A - Non-CFC Ozone Depletion Refrigerant on low temp units) – (Refrigerant must meet District Standards, Industry Standards, and local Codes): given through the charging valve in the high side passing all of the liquid refrigerants through a charging dehydrator. All charging lines and gauges must be purged of air before connection with the system. Refrigerant: unused and shall be delivered in clean containers. After the system is fully charged: start and place it in full operation.

D. Refrigeration system to be installed by the **PRE-APPROVED INSTALLERS** listed below:

1. QBR Refrigeration, 30083 Hwy 90 Blvd., Katy, TX 77493, Mr. Andy Spellins, (713) 973-2875, [andy.spellins@qbrsales.com](mailto:andy.spellins@qbrsales.com)
2. Machine Ice, 8915 Sweetwater Ln., Houston, TX 77037, Mr. Will Weaver, (281) 448-7823
3. Coolers Inc., 6922 Alder Dr., Houston, TX 77081, Mr. Lee Mamone, (713) 665-8886

## **2.35 PRE-APPROVED KITCHEN EQUIPMENT CONTRACTORS**

A. Only the following named Subcontractors and those approved later, if any, are approved for inclusion in the Contractor's Bid.

B. **Any contractor requesting inclusion within this bid must submit AIA form 305 a minimum of 14 days before the bid date for review or as required by Architect.**

1. Stafford Smith, Mr. JP Garcia, 7129 North Loop East, Houston, TX 77028, (713) 892-5001, E-mail: [jpgarcia@staffordsmith.com](mailto:jpgarcia@staffordsmith.com)
2. Kirby Restaurant Supply, Mr. Billy Anderson, 809 S. Eastman Road, Longview, Texas 75602, Phone: (903) 757-2723, Fax: (903) 757-9519, Email: [billya@kirbyrestaurantsup.com](mailto:billya@kirbyrestaurantsup.com)
3. Mission Restaurant Supply, 1126 S. St. Mary's Street, San Antonio, Texas 78210. Mr. Brian Mosher, Phone (210) 354-0690, Fax (210) 354-0746, E-mail: [brianM@missionrs.com](mailto:brianM@missionrs.com)
4. Kommercial Kitchens, Mr. Terry Woodard, 13544 East Fwy., Houston, TX 77015, (409) 769-1199, E-mail: [terry@kommercialkitchens.com](mailto:terry@kommercialkitchens.com)

5. Amundsen Commercial Kitchens, Mr. Lewis Beville, 105 Montie, Longview, TX 75604, (903) 576-6354, E-mail: [lewis@afeok.com](mailto:lewis@afeok.com)
6. Supreme Fixtures Co., Inc., Mr. Tim Hampel, 11900 Vinny Ridge Road, P.O. Box 193655, Little Rock, AR 72219, Phone: (501) 455-2552, Fax: (501) 455-0802, E-mail: [tim@supremefixture.com](mailto:tim@supremefixture.com)

## **2.36 PRE-APPROVED STAINLESS-STEEL FABRICATION SUPPLIERS**

- A. Only the following named Subcontractors and those approved later, if any, are approved for inclusion in the Contractor's Bid.
- B. **Any supplier requesting inclusion within this bid must submit AIA form 305 at least 14 days before the bid date for review or as required by Architect.**
  1. Texas Metal Equipment Company, Mr. Andrew Harman, 6707 Mayard, Houston, Texas 77041, (713) 466-8722, Fax: (713) 466-0166
  2. Kommercial Kitchens, Mr. Terry Woodard, 13544 East Fwy., Houston, TX 77015, (832) 767-5287
  3. Mission Restaurant Supply, 1126 S. St. Mary's Street, San Antonio, Texas 78210. Mr. Brian Mosher, Phone (210) 354-0690, Fax (210) 354-0746, E-mail: [brianM@missionrs.com](mailto:brianM@missionrs.com)

## **PART 3 - EXECUTION**

### **3.1 DELIVERY AND INSTALLATION**

- A. Supervision: Provide a skilled and proficient foreman or supervisor who shall remain on the job during the entire installation.
- B. Delivery: Coordinate with the progress of construction and Owner's operation schedules. Unless otherwise instructed and documented by Owner or General Contractor, the following procedures apply:
  1. Field-Assembled Fixed Equipment integrated into the structure (e.g., cold storage assemblies, exhaust hoods, drain trench/grate assemblies, conveyor systems, ceiling-mounted utensil racks, etc.) are to be sent to the job site when directed by the General Contractor and installed/protected accordingly.
  2. All other Fixed Equipment: delivered after completion of work on adjacent finished ceilings, lighting, finished floor and wall systems, including painting.
  3. Major Movable Equipment: delivered, when possible, to inventory in a secured area for interim job-site storage or, if the secured area is unavailable when fixed equipment installation/clean-up has been completed.
  4. Minor appliances and loose items (e.g., pans, covers, flatware containers, etc.) should be delivered only when the Owner is prepared to receive and inventory such items.

- C. Installation: performed by the manufacturer of custom fabricated fixtures.
1. Assemble, square, level, and ready all items for the final utility connections.
  2. Cut neatly around obstructions to provide sanitary conditions.
  3. Where gaps of  $\frac{1}{4}$ " or less occur adjacent to or between equipment, insert rope backing and smoothly applied General Electric construction sealant Series SE-1200 silicone mastic (silver color). Mask both sides of the gap for neat sealant application and remove excess. If space exceeds  $\frac{1}{4}$ ," neatly install 18-gauge stainless steel trim molding of proper shape with concealed attachment. Use epoxy cement or "Z" clips wherever possible to secure stainless steel trim. Exposed edges or corners of trim: eased and smooth.
  4. Refrigeration coil drain line runs to an indirect drain connection greater than 2" from the face of the wall or panel: Either of the following field procedures:
    - a. Trench the floor and provide a 6" wide x 2" deep 16-gauge stainless steel sloping (-1" to -2") trough from the face of the cooler/freezer wall to the body of the floor sink/floor drain. Trough: turned up 4" at the wall;  $\frac{3}{4}$ " flange with  $\frac{1}{2}$ " turndown at both long sides. Set trough in waterproof mastic and seal 1" OD drain tube penetration into floor sink/floor drain at -2 $\frac{1}{2}$ " BFF. Patch the floor to match adjacent material/surface.
    - b. Provide 12" x 6" x 2" deep 16-gauge stainless steel condensate pan mounted to cooler/freezer wall at 6" AFF clear. Trench the floor and install a 1" OD drain line from the bottom of the pan to the body of the floor sink/drain. Slope drain line  $\frac{1}{4}$ " per foot and seal all connections watertight. Patch the floor to match adjacent material/surface.
- D. Protection of Work:
1. Fabricated fixtures: Fiberboard or plywood taped to tops and exposed body panels/components.
  2. Manufactured Equipment: Fiberboard or plywood taped as required by equipment shape and installation-access requirements.
  3. Prohibited use of equipment: Tool and materials storage, workbench, scaffold, stacking area, etc.
  4. Damaged Equipment: Immediately documented and submitted to the Owner with the Contractor's recommendation of action for repair or replacement and its impact on the Project Schedule and Contract Amount, if any.

### **3.2 CLEAN AND ADJUST**

- A. Clean up and remove all debris from this Work from the job site as the installation progresses.
- B. Lubricate and adjust drawer slides, hinges, and casters.

- C. Adjust pressure regulating valves, timed-delay relays, thermostatic controls, temperature sensors, exhaust hood grilles, etc.
- D. Clean or replace faucet aerators and line strainers.
- E. Touch-up damage to painted finishes.
- F. Startup and check the operation of all refrigeration systems for at least 72 hours before acceptance.

### **3.3 EQUIPMENT START-UP/DEMONSTRATION**

- A. Carefully test, adjust, and regulate all equipment following the manufacturer's instructions and certify in writing to the Owner that the installation, adjustments, and performance are in full compliance.
- B. Provide the Owner or food service Operators with a thorough operational demonstration of all equipment and furnish instructions for general and specific care and maintenance. Coordinate and schedule selected equipment items and attendees with the Owner at least two weeks before the demonstration starts.

### **3.4 FINAL OBSERVATION**

- A. Final observation will be made when the Contractor certifies that they have completed their work, thoroughly reviewed the installation/operation of each item in the contract, and found it to comply with the Construction Documents.
- B. Repetitive final observations (more than two) and all costs associated with it which may be incurred due to the Contractor's failure to comply with the requirements of this Article will be invoiced to this Contractor on a \$70.00/hr and expense basis.

#### **PART 4 - EQUIPMENT SCHEDULE**

- 4.1 REGULARLY MANUFACTURED EQUIPMENT/COMPONENTS:** Standard finishes and accessories unless specifically deleted or superseded by the Contract Documents.
- 4.2 FABRICATED AND FIELD-ASSEMBLED EQUIPMENT:** Arrangement and configuration as shown on Plans, Elevations, Detail Drawings, and outlined in Specifications.
- 4.3 REFER TO DRAWINGS:** For unit quantities and plumbing, electrical or mechanical provisions are required, including the manufacturer's optional voltages, wattages, burner capacities, etc.
- 4.4 REFER TO PART 2 – PRODUCTS:** For accessories, fittings, requirements, and procedures related to the listed buy-out and fabricated equipment.
- 4.5 ALTERNATE MANUFACTURER REQUIREMENTS:** A specific product manufactured by the listed pre-approved equals shown under Section 4.7 Food Service Equipment are acceptable only if the specific product can evidence compliance with the specified line items and the contract documents (Refer to Section 1.6; Sub-Section A.).
- 4.6 RE-USED EXISTING EQUIPMENT IF SHOWN**
- A. Existing equipment scheduled for re-use is to be inventoried and documented that equipment is in operating condition once Kitchen Contractor has taken ownership.
  - B. Provide pictures of all equipment once inventoried and issue them to the architect to ensure that equipment has not been damaged.
  - C. Verify the locations of all equipment with the owner.
  - D. Existing equipment that is to be reused may need parts or accessories for proper and complete operation. Submit a report listing all items with pricing for approval to allow complete installation.
  - E. Utility disconnection and re-connection: Under Divisions 22 and 26. Kitchen Contractor to verify utility requirements of existing equipment and coordinate with Foodservice Design Professionals (FDP) as required. All utilities not scheduled for re-use must be capped and covered by required disciplines.
  - F. Disassembly, removal, transportation, and relocation: under this Section and scheduled with General Contractor. The owner's representative must be present and coordinate the date/time with the owner.
  - G. Thoroughly clean inside and out before relocation.
  - H. Review functional parts (e.g., doors, controls, heating elements, compressors, etc.) and submit a report of required repairs and cost estimates. Any finishes or equipment damaged due to construction will be repaired as required.
  - I. Existing equipment not scheduled for reuse is to be carefully removed/relocated by the Kitchen Contractor per the Owner's direction. Kitchen Contractor to coordinate the date/time with General Contractor and Owner.

- J. Removal or replacement of existing equipment is to be scheduled for times of least interruption and inconvenience to the food service operation. Submit the proposed time frame schedule, task sequence, and process for approval before starting work.
- K. Kitchen Contractor to verify size and shape for all existing re-used equipment and coordinate with Foodservice Design Professionals (FDP) as required.
- L. Any modification(s) required/desired for re-used existing equipment to be verified by the Kitchen Contractor. Before the changes are made, all modifications must be approved by the Owner and Foodservice Design Professionals (FDP).
- M. The KEC is to verify and coordinate all the utility requirements with the construction documents as required. Refer to the general specifications regarding conflicts.

#### **4.7 FOOD SERVICE EQUIPMENT**

- A. All equipment is to have a performance check from factory-authorized personnel. Warranties will begin on the day of the performance check.
- B. All equipment and internal components should be of domestic origin where possible.
- C. Architectural coordination items for potential Food Service color, material or signage selections:
  - 1. Countertops: Stone (stainless steel is provided unless otherwise specified)
  - 2. Tray slides: Corian or Stone (stainless steel is provided unless otherwise specified)
  - 3. Counter fronts: Ceramic tile, 3 Form, or Plastic Laminate
  - 4. Sneeze Guards: Stone insets
  - 5. General color, material and graphic selections:
    - a. Display Air Screen Merchandisers – Color selection: Powder Coat or Plastic Laminate (stainless steel is provided unless otherwise specified)
    - b. Bakery Display Cases – Color selection: Powder Coat or Plastic Laminate (stainless steel is provided unless otherwise specified)
    - c. Pass Thru or Reach In Holding Cabinets - Color selection: Powder Coat (Mfg.: True) or Plastic Laminate (Mfg.: Traulsen) (Stainless steel is provided unless otherwise specified)
    - d. Hanging Heat Lamps – Track and Fixture color selection
    - e. Heated Merchandisers
    - f. Portable Guide Rails – Stanchion and Belt color selection
    - g. Popcorn machine – Signage selection

- h. Bottle Cooler – Signage selection
  - i. Graphics Package information
  - j. Hot Food Well covers
- D. General Architectural finishes:
  - 1. Walls: Ceramic Tile, Flat FRP, or Molded FRP (Smooth, Impervious, and easily cleanable as approved by local jurisdiction)
  - 2. Ceilings: Removable Vinyl Face Tile (Smooth, Impervious, and easily cleanable as approved by local jurisdiction)
  - 3. Floors: Tile, Epoxy, or Rubberized flooring system (Smooth, impervious, easily cleanable and slip resistant as approved by local jurisdiction) (Coordinate floor tile transition at serving lines)
  - 4. Floors: Cold Storage Assembly – Extend kitchen floor flush into Cold Storage Assembly with coved base
  - 5. Furr Downs above Serving Counters



**MAIN KITCHEN**

**ITEM NO. 102                      COLD STORAGE ASSEMBLY**

**QUANTITY 1**

**Manufacturer:** American Panel  
**Model:** ---  
**Size and Shape:** Refer to drawings  
**Alternate:** Thermokool, Bally, Kolpak

1. Installation to be completed by Factory Approved / Authorized installer. Refer to Section 2.33  
Submittal drawings to include factory approval letter or certificate.
2. Assembly to have 9'-6" interior clearance.
3. 304 #3 finish 20 gauge stainless steel finish where exposed, 20 gauge galvanized steel where concealed.
4. Factory floor with smooth aluminum finish, recessed in slab 8 1/2". Secure floor to wall assembly with cam-lock assembly. KEC to ensure the floor assembly is level prior to the wearing bed installation. Kitchens finished floor to extend to walk-in.
5. Threshold to be smooth and level with finished floor.
6. Interior walls to be .040" aluminum, white embossed texture on walls.
7. Ceiling to be embossed textured .040" aluminum baked white enamel.
8. Two (2) 36" doors. Doors to be 18 gauge stainless steel, type 304 (18-8), #3 finish, with heated perimeter / door jambs / windows and threshold heaters. Each door to be equipped with 3'-0" high diamond tread kick plate on both sides of doors. Mount hinged doors on two (2) Kason model no. 1346 (or equal); polished chrome plated nylon cam-lift hinges.
9. Provide an illuminated Push Button and Entrapment alarm within cooler and freezer, interconnected to Edwards 860 Series Strobe Beacons (or equal), in Kitchen above freezer and Cafetorium (Verify Location). (Strobe Beacons by Div. 26). Alarm to notify facility personnel of activation based on district/owner requirements.
10. Provide Kason model no. 0487 Frost Free Inside release (or equal). Fiberglass rod and plastic flange, with safety glow plastic knob, ADA compliant.
11. Manual backup vacuum release mechanism to punch hole in wall assembly to release vacuum within freezer assembly. Mechanism to include a pull-down handle with freeze-proof hand grip. Handle to have the ability to penetrate and/or punch hole in wall accordingly to assist with opening of door assembly in the event of entrapment (and failure of Frost free inside release button). Wall panel to include a knockout section to assist with requirements. Release mechanism assembly to be built-in/mounted to the door assembly structural frame to minimize mechanism tear-out and/or failure. Handle to be painted yellow with phenolic label "Vacuum Pressure Release".
12. 18 gauge stainless steel, type 304 (18-8), #3 finish trim where adjacent to walls and enclosure panels that extend to 2" above finished ceiling.
13. Freezer One (1) lot LED light fixtures to operate in temperatures to -20 F. **Lights to be installed perpendicular to coils.**

14. Refrigerator- One (1) lot LED light fixtures. Lights to be installed perpendicular to coils.
15. 3'-0" high diamond tread plate at exposed exterior surfaces. Fasten to wall with stainless steel fasteners.
16. Provide door bumper at doors.
17. All conduit to be exposed. No ceiling penetrations.
18. Provide Manufacturers alarm/control system that includes hi/low limits. Route temperature sensor to be located to the side of evaporator coil.
19. Doors to be provided with CCI Industries, Inc., Clear-VU swinging door assemblies.
20. K.E.C. to provide aluminum coved base to interior of assembly. Provide sealant between floor and wall panels.
21. All holes in assembly to be sealed by factory installer.
22. 6" oversized heated Pressure Relief Port with red indicator light to confirm electrical interconnection. Locate 12" below ceiling on cooler/freezer common wall and on cooler wall. Additional Heated Relief Port to be provided on freezer door and interconnected to door assembly electrical. Locate upper corner of hinged side of door.
23. KEC to field verify all horizontal/vertical measurements and conditions at the building prior to fabrication or delivery of equipment.
24. KEC to provide 1 year walk-in panel installation warranty. KEC is responsible for overall install accuracy/quality and quality control of work performed regardless of installer or any field modifications due to building/construction conditions. KEC to provide Letter of Install Approval to FDP upon completed install.
25. Manufacturer to provide One Year Parts and Labor Warranty.
26. Interwiring of temperature monitor panel to master building alarm system or to the Owner's network. Technology department to provide all interfacing of alarm system and with the building alarm system. Conduit from refrigeration system to monitor by Division 26. Temperature Monitor installation at 4'-0" above finished floor. All conduit to be located above walk-in cooler/freezer ceiling. Exposed electrical conduit is not acceptable. Threshold to be smooth and level need to be moved up just after last flooring option line.
27. Manufacturer Representative to provide training on controls and inside emergency release mechanisms.
28. Manufacturer to review final installation and provide letter confirming installation meets manufacturer requirements.
29. **Special Instruction:** Assembly to be connected to back-up generator per TISD standards.

**ITEM NO. 103.1**

**COLD STORAGE REFRIGERATION SYSTEM**

**QUANTITY 1**

<b>Manufacturer:</b>	RDT
<b>Model:</b>	ZS1-2 EcoSmart
<b>Size and Shape:</b>	Refer to drawings
<b>Alternate:</b>	Cold Zone

1. Air cooled system.
2. Cooler temperature to be +35 degrees.

3. Freezer temperature to be -10 degrees.
4. EcoSmart system on demand defrost.
5. KE2 Controllers located per Owner requirements.
6. S/S covered housing.
7. All exterior piping to be aluminum wrapped.
8. System to accommodate Item No. 102 Cold Storage Assembly.
9. S/S covered housing mounted to a 24" tall 1/8 galvanized angle iron frame anchored to concrete pad. Provide S/S skirting around frame.
10. Mount condensing unit on common exterior rack. Refer to Architectural and Engineering drawings for exact location of remote unit. Coordinate routing of refrigeration lines and conduit with appropriate trades. Heat tape and insulate all drain lines. General Contractor to seal all building penetrations at refrigeration lines.
11. **Special Instruction:** Unit to be connected to back-up generator per TISD standards.

**ITEM NO. 104                      COLD STORAGE SHELVING**

**QUANTITY 1**

**Manufacturer:** Cambro  
**Model:** Camshelving Premium  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Each unit to be four (4) tiers high with open grid mats.
2. Four (4) 74" post per unit. Provide foot plates at all posts when assembly is supplied with walk-in floor.
3. Refer to drawings for size, width and lengths.
4. Quantity One (1) to equal One (1) lot: all shelving shown within cold storage assembly.
5. Verify shelving requirements with approved submittal prior to ordering.

**ITEM NO. 105                      DUNNAGE RACK**

**QUANTITY 2**

**Manufacturer:** Cambro  
**Model:** Camshelving Premium  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Size as shown.

**ITEM NO. 107                      DRY STORAGE SHELVING**

**QUANTITY 2**

**Manufacturer:** Cambro  
**Model:** Camshelving Premium  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Each unit to be five (5) tiers high with open grid shelving.
2. Four (4) 86" posts per unit.
3. Quantity Two (2) to equal One (1) Lot: all shelving shown within the dry storage room.
4. Refer to drawings for size, width, and lengths.
5. Verify shelving requirements with approved submittal prior to ordering.

**ITEM NO. 109.1**

**ICE MAKER**

**QUANTITY 1**

**Manufacturer:** Hoshizaki  
**Model:** KML-500MAJ/B-500  
**Size and Shape:** Refer to drawings  
**Alternate:** Manitowoc

1. One (1) ice maker model no. KML-500MAJ
2. One (1) ice bin model no. B-500
  1. Stainless steel bin.
  2. Stainless steel legs.
  3. Provide bin adapter kit as required.
  4. Provide Luminice II Virus and Bacteria Inhibitor.
  5. Provide sizes and quantities as required: T&S model #HW-6VERIFY-48 water hose and disconnect from filter to Ice Machine.
3. One (1) Everpure EV9293-01 pre-filter and water filter sized to manufactures recommendations. Mount on wall adjacent to ice machine in an easily accessible location.
6. Coordinate cord and cap with receptacle. Water supply to filter to be hard copper plumbed. 60" long flex hose from filter to ice maker. Interconnection thru water filter to ice machine and final connection by Division 22. Water filter overflow tube to be strapped to back side of ice machine and extend to 1" above floor sink.

**ITEM NO. 110B**

**STACKED WASHER/DRYER**

**QUANTITY 1**

**Manufacturer:** Owner Furnished  
**Model:** ---  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Washer:
  2. 2.0 cubic ft. capacity.
  3. Straight vane agitator.
  4. 7 cycles, 2-speed.
  5. 4 water temperatures.
  6. "Quick pak" sound insulation.
  7. Color to be white.
  8. Water and drain hoses.
9. Dryer:

10. 3.4 cubic ft. capacity.
11. 4 cycles plus Air only.
12. Auto dry.
13. Wrinkle Guard 1.
14. Color to be white.
15. To include dryer cord and vent kit.
16. Units to include model stationary assembly including: white stack stand, dryer wall mount kit, door latch kit.
17. Verify utility requirements with owner/operator. Models at time of delivery shall be the current models' numbers.

**ITEM NO. 111                      CHEMICAL SHELF**

**QUANTITY 1**

**Manufacturer:** Cambro  
**Model:** Camshelving Premium  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Each unit to be four (4) tiers high with open grid mats.
2. Four (4) 74" posts per unit.

**ITEM NO. 121                      TWO COMPARTMENT SINK W. DISPOSER**

**QUANTITY 2**

**Manufacturer:** Custom Fabricated  
**Model:** ---  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Top: 14 gauge type 304 S/S marine edge with 2" turndown at free sides.
2. Open base construction.
3. 10" high splash where adjacent to walls/fixtures.
4. Two (2) 24" x 26" x 15" deep sink compartments.
5. One (1) T&S model no. B-0291, splash mount faucet, 18" swing nozzle, LL inlets, for ¾" hot and cold water connections.
6. Two (2) Fisher 22306 twist waste valve 3 1/2" x 2" with overflow and tailpiece. Provide 18 gauge S/S bracket for drain handle welded to sink bottom.
7. Provide One (1) T&S model no. B-0133-EE-CR-8C pre-rinse, **two (2)** B-0108-C spray head, two(2) B-0109-04 18" long wall bracket (dealer to cut to correct length), one (1) additional spray face model no. 108SFRK with ceramic cartridges.
8. 16 gauge S/S undershelf per drawings.
9. Disposer - installed in top integrally welded disposer cone. Notch and punch splash turn back for vacuum breaker. 12 gauge S/S bracket mounted below counter top for disposer control panel ground and polished to match top.

10. 12" deep single post mounted overshef at 18" above counter top, punched to accommodate spray rinse.
11. Post mounted utensil rack, extend 1-5/8" diameter S/S post from back splash, turn forward 12" and weld full length x 2" x 1/4" S/S bar with Component Hardware model no. V-77-4401 S/S sliding hooks at 8" on center. Verify height with owner.
12. One (1) Chicago model no. 305-VBRCF hose bibb and rack mounted on 12 gauge S/S bracket ground and polished to match top. Hose and spray nozzle by owner.
13. Omit rear rail at sink compartments, disposer, and front rail at hose bibb.
14. Two (2) "Richlite" 1/2" thick removable sink covers installed at each sink. Weld 1/4" bar stock, set 5/8" below work surface at all four corners for support of sink covers. Two (2) finger holes per board.
15. Provide top and bottom c-channel support storage for sink covers at right or left end of counter.
16. One (1) Edlund model no. S-11 Manual can opener, mounted on raised platform.
17. Flanged feet at front only.
18. Seal at all splash penetrations.

**ITEM NO. 123                      DISPOSER-CONE MOUNT/SINK MOUNT**

**QUANTITY 4**

<b>Manufacturer:</b>	Salvajor
<b>Model:</b>	200-CA-18-ARSS -LD /200-SA-6-ARSS-LD
<b>Size and Shape:</b>	Refer to drawings
<b>Alternate:</b>	---

1. Fixed nozzle.
2. Delete standard syphon breakers and provide T & S B-0456-04 vacuum breakers and mount 6" from tabletop to base of breaker.
3. Solenoid valve.
4. Flow control.
5. Model no. ARSS-LD control panel.
6. Auto-reverse.
7. Dejamming tool.
8. Install vacuum breaker in splash.
9. S/S cone cover.
10. Perforated silver saver and disposer cone with scrap ring.
11. Two (2) Swirl inlet located in disposer cone at a 45 degree angle.
12. GC to pipe 1/2" cold water to disposer body and swirl inlets. Excess electrical cord to be secured to fabrication as required. Install into counter by section 114000.

**ITEM NO. 124                      WORKTABLE W/ OVERSHELF**

**QUANTITY 2**

<b>Manufacturer:</b>	Custom Fabricated
<b>Model:</b>	---
<b>Size and Shape:</b>	Refer to drawings

**Alternate:** ---

1. Top: 14-gauge type 304 S/S top with 6" high backsplash at wall and 2" turndown at free sides.
2. Open base construction.
3. 16-gauge S/S overshef post mounted 18" above working surface.
4. 16-gauge S/S undershef.
5. Two (2) 20" W x 20" L drawer assemblies. Component Hardware #S52-2020 drawer slides with delrin bearings - 200lb capacity. Component Hardware #S80-2020 drawer pan.
6. Close back of splash when exposed.

**ITEM NO. 125                      20 QT. MIXER W/STAND**

**QUANTITY 2**

**Manufacturer:** Hobart  
**Model:** HL200  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Food mixer, Bench Model, 1/2-HP motor, 20 qt. Capacity.
2. 115/60/1 ph.
3. 15 minute timer.
4. Epoxy enamel finish-bench model.
5. One (1) 20 qt. S/S bowl.
6. One (1) 20 qt. Aluminum "B" flat beater.
7. One (1) 20 qt. S/S "D" wire whip.
8. One (1) 20 qt. "ED" dough hook.
9. One (1) 20 qt. Lexan splash cover.
10. One (1) Caddy model no. T-242 mobile mixer stand, with casters, two (2) with brakes. Secure mixer to table with non-corrosive bolts. Alternate- New Age.
11. Stand to be Pre-Drilled to accommodate Mixer.

**ITEM NO. 127                      SLICER WITH STAND**

**QUANTITY 1**

**Manufacturer:** Hobart  
**Model:** HS9N-1  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. One (1) high/low fence assembly.
2. Tubular S/S food chute.
3. Cord and plug.
4. One (1) Caddy slicer T-249A stand with casters, two (2) with brakes. Alternate-New Age

**ITEM NO. 128                      UTILITY CART**

**QUANTITY 2**

**Manufacturer:** Lakeside  
**Model:** 522  
**Size and Shape:** Refer to drawings  
**Alternate:** Caddy

1. Four (4) N.S.F. approved non-marking casters, Two (2) with brakes.
2. Extended perimeter bumper.

**ITEM NO. 129                      WORKTABLE W/S.BAR UT.RACK**

**QUANTITY 5**

**Manufacturer:** Custom Fabricated  
**Model:** ---  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Top: 14 gauge type 304 S/S, 2" turn down at free sides.
2. Open base construction.
3. 16 gauge S/S undershelf.
4. Two (2) 20" W x 20" L drawer assemblies. Component Hardware #S52-2020 drawer slides with delrin bearings - 200lb capacity. Component Hardware #S80-2020 drawer pan.
5. Flanged feet.
6. Post mounted utensil rack, extend 1-5/8" diameter S/S post from cross rail, thru top to 78" A.F.F. and weld full length x 2" x 1/4" S/S bar with Component Hardware model no. V-77-4401 S/S sliding hooks at 8" on center. Verify height with Owner.
7. Provide a duplex receptacle and housing mounted below countertop per drawings. Interconnect and prewire a 5'-0" cord and plug out of receptacle housing for plugging into ceiling drop cord receptacle. 114000 and Div. 26 to coordinate location of drop cord receptacle.

**ITEM NO. 130                      WORKTABLE**

**QUANTITY 1**

**Manufacturer:** Custom Fabricated  
**Model:** ---  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Top: 14 gauge type 304 S/S, 6" high backsplash at walls, 2" turndown at free sides. Close back of splash when exposed.
2. Open base construction.
3. 16 gauge S/S undershelf.
4. One (1) 20" W x 20" L drawer assembly. Component Hardware #S52-2020 drawer slides with delrin bearings - 200lb capacity. Component Hardware #S80-2020 drawer pan.
5. 6" S/S adjustable feet.



**ITEM NO. 136                      BAKER'S TABLE**

**QUANTITY 1**

**Manufacturer:** Custom Fabricated  
**Model:** ---  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Top: 14 gauge type 304 S/S with 2" square turn down at front, 6" high enclosed splash at sides and rear.
2. Provide finished back at exposed backsplash.
3. 12" deep post mounted overself at 18" above counter top.
4. 18 gauge butt joint wall panel from splash to underside of shelf.
5. 16 gauge S/S flour trough.
6. Rear rail only.
7. One (1) lot Rubbermaid no. FG360288WHT ingredient bins.
8. One (1) tier of three (3) 20" x 20" x 5" deep all stainless steel drawers. To be in #18 gauge stainless steel housing having 3/4" radius (vertical) exterior corners.

**ITEM NO. 138                      PAN RACK**

**QUANTITY 4**

**Manufacturer:** CresCor  
**Model:** 207-UA-13A  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Four (4) 5" casters.
2. Adjustable universal slides on 1-1/2" centers.
3. Corner bumpers.
4. Omit bumper on roll-in racks.

**ITEM NO. 139                      INSUL MOBILE PROOFER**

**QUANTITY 1**

**Manufacturer:** CresCor  
**Model:** H-137-WSUA-12D  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Insulated proofer/heated cabinet.
2. Field reversible doors.
3. Adjustable universal angles.
4. Four (4) 5" casters, two (2) with brakes.
5. Tempered glass door windows.
6. Key lock handle.
7. Corner bumpers.

8. Cord and plug. Coordinate NEMA configuration with Electrician.
9. Thermometer.
10. 1500 watt heater.

**ITEM NO. 143                      WORKTABLE WITH SINK & S.BAR UT.RACK**

**QUANTITY 1**

**Manufacturer:** Custom Fabricated  
**Model:** ---  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Top: 14 gauge type 304 S/S, 2" turn down at all sides.
2. Provide table in two (2) sections-one (1) 27" and one (1) 33" section. Refer to detail.
3. Open base construction.
4. Full length 16 gauge S/S undershelf.
5. Four (4) 20" W x 20" L drawer assemblies. Component Hardware #S52-2020 drawer slides with delrin bearings - 200lb capacity. Component Hardware #S80-2020 drawer pan.
6. One (1) 15" x 20" x 10" deep sink compartment. Coordinate location with drain overflow.
7. One (1) T&S model no. B-0320-BB-CR, rigid gooseneck, ceramic cartridges, deck faucet for ¾" hot and cold water connections.
8. One (1) Fisher 22306 twist waste valve 3 1/2" x 2" with overflow and tailpiece. Provide 18 gauge S/S bracket for drain handle welded to sink bottom.
9. Post mounted utensil rack, extend 1-5/8" diameter S/S post from cross rail, thru top to 78" A.F.F. and weld full length x 2" x ¼" S/S bar with Component Hardware model no. V-77-4401 S/S sliding hooks at 8" on center. Verify height with Owner. 48" max. upright post spacing.
10. Provide a duplex receptacle and housing mounted below countertop per drawings. Interconnect and prewire a 5'-0" cord and plug out of receptacle housing for plugging into ceiling drop cord receptacle. 114000 and Div. 26 to coordinate location of drop cord receptacle.
11. Omit front cross rail at sink section.
12. Flanged feet.

**ITEM NO. 151                      FIRE PROTECTION SYSTEM**

**QUANTITY 6**

**Manufacturer:** Ansul  
**Model:** R102  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Duct and plenum protection to exhaust hood.
2. Surface protection for cooking equipment.
3. Locate remote fire pulls as recommended by Fire Marshal.
4. One (1) lot Mechanical gas valve (maximum diameter as required). Size as required. Furnished by Section 114000, installed by Division 22. Kitchen Equipment Contractor to coordinate location

with local Fire Marshal requirements prior to submittal review. All conduits to be recessed within wall, SURFACE MOUNTING WILL NOT BE ACCEPTED.

5. System to meet U.L. 300 requirements.
6. Provide one (1) hand held Type 'K' and ABC 6 liter fire extinguisher per Ansul System, surface wall mounted.
7. Exposed pipe threads are unacceptable.
8. All exposed piping to be chrome plated.
9. All hood penetrations to have U.L. listed "Quick Seal". Provide s/s escutcheons at all hood penetrations.
10. Provide phenolic I.D. labels for exhaust hood, remote fire pull, light/fan switches and fire protection system.
11. Provide a manufacturer performance test and report that verifies this system is fully operational.
12. Provide s/s cabinet as shown on plan.
13. Installer to provide one (1) Ansul system per exhaust hood, review drawings and provide systems as required.
14. Install hand held extinguishers, maximum of 3'-2" A.F.F. to top of unit.

<b>ITEM NO. 152</b>	<b>EXHAUST HOOD</b>	<b>QUANTITY 1</b>
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<b>Manufacturer:</b>	By Mechanical
<b>Model:</b>	---
<b>Size and Shape:</b>	---
<b>Alternate:</b>	---

<b>ITEM NO. 153</b>	<b>EXHAUST HOOD</b>	<b>QUANTITY 1</b>
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<b>Manufacturer:</b>	By Mechanical
<b>Model:</b>	---
<b>Size and Shape:</b>	---
<b>Alternate:</b>	---

<b>ITEM NO. 154</b>	<b>EXHAUST HOOD</b>	<b>QUANTITY 1</b>
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<b>Manufacturer:</b>	By Mechanical
<b>Model:</b>	---
<b>Size and Shape:</b>	---
<b>Alternate:</b>	---

<b>ITEM NO. 155</b>	<b>EXHAUST HOOD</b>	<b>QUANTITY 1</b>
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<b>Manufacturer:</b>	By Mechanical
<b>Model:</b>	---
<b>Size and Shape:</b>	---

**Alternate:** ---

**ITEM NO. 156 EXHAUST HOOD**

**QUANTITY 1**

**Manufacturer:** By Mechanical  
**Model:** ---  
**Size and Shape:** ---  
**Alternate:** ---

**ITEM NO. 157 EXHAUST HOOD**

**QUANTITY 1**

**Manufacturer:** By Mechanical  
**Model:** ---  
**Size and Shape:** ---  
**Alternate:** ---

**ITEM NO. 161 CONVECTION OVEN**

**QUANTITY 7**

**Manufacturer:** Blodgett  
**Model:** DFG-100ES DBL  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. S/S front, top and sides.
2. Two (2) 1/2 HP 2-speed motors.
3. Natural gas.
4. SSI-M solid state infinite control with manual timer.
5. Electronic spark ignition.
6. Five (5) oven racks per compartment.
7. Dual pane thermal windows.
8. Simultaneous door operation.
9. Heavy duty casters, two (2) with brakes.
10. Provide quantities and sizes required: T&S Model #HG-4VERIFY-48SK Antimicrobial Coated Hose w/NPT Male Ends, Swivel Links, 2-Piece Quick Disconnect, 90° Elbow & Installation Kit w/coiled restraining device, full port gas valve, lifetime warranty.
11. Dedicated gas connections, do not manifold.
12. Shunt trip breaker by Division 26.

**ITEM NO. 162 DBL CONVECTION STEAMER - GAS**

**QUANTITY 2**

**Manufacturer:** Cleveland  
**Model:** 24CGA10.2  
**Size and Shape:** Refer to drawings

**Alternate:** ---

1. Double stack ten (10) pan capacity.
2. Touch screen controls., self diagnostics, user selected automatic holding feature, 10 namable pan timers, door open alert, Clock, Programmable delime schedule with on-screen directions and notifications. 1 minute button adds to cook time, user optional load compensating timer.
3. Two (2) compartments.
4. Individual connections.
5. Stainless steel legs.
6. Field stacking kit.
7. Provide quantities and sizes required: T&S Model #HG-4VERIFY-48SK Antimicrobial Coated Hose w/NPT Male Ends, Swivel Links, 2-Piece Quick Disconnect, 90° Elbow & Installation Kit w/coiled restraining device, full port gas valve, lifetime warranty.
8. Provide sizes and quantities as required: T&S model #HW-6VERIFY-48 water hose and disconnect from filter to steamer, color coded for filtered and non-filtered water.
9. Provide Everpure filtration system as recommended by the manufacturer. Div 22 to interconnect equipment to the filter system.
10. KEC to coordinate filtered and unfiltered water with steamer, do not connect filtered water to unfiltered water connection.
11. Coordinate location with floor sink outside steam free zone. Division 26 to provide shunt trip breaker.

**ITEM NO. 164**

**30 GA. TILT BRAISING PAN- MANUAL TILT**

**QUANTITY 1**

**Manufacturer:** Groen  
**Model:** BPM-30GA  
**Size and Shape:** Refer to drawings  
**Alternate:** Cleveland

1. Advanced Control-control system.
2. Manual tilt.
3. S/S construction.
4. Open leg frame.
5. Steamer pan inserts.
6. Pan carrier.
7. Etch marks.
8. Double pantry swing faucet.
9. Flanged feet. Secure rear to floor with non-corrosive anchors.
10. Provide quantities and sizes required: T&S Model #HG-4VERIFY-48SK Antimicrobial Coated Hose w/NPT Male Ends, Swivel Links, 2-Piece Quick Disconnect, 90° Elbow & Installation Kit w/coiled restraining device, full port gas valve, lifetime warranty.
11. Trench Liner to consist of:
12. S/S trench liner by 114000. Installation by G.C.
13. Custom Fabricated or IMC/Teddy

14. Fibergrate: Gray #2 1" Thick, 1 1/2" squares mesh, Quartz grit top. Provide in two (2) equal sections, all ends to be finished ends.
15. 14 gauge s/s liner
16. Klein no. 1834-1010-100 basket drain.
17. Klein no. 1870-1001-3251 safety chain.
18. Location of trench liner is critical. G.C. and 114000 to verify location prior to concrete pour. Oversize trench liner block out to accommodate equipment pour path.

**ITEM NO. 165                      TWO BURNER RANGE**

**QUANTITY 1**

**Manufacturer:** Garland  
**Model:** MST4S-E  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Cabinet base with door.
2. Removable cast iron grates.
3. Removable drippings tray.
4. 1" rear gas connections.
5. Set of (4) casters, 6" high (2) locking.
6. External pressure regulator.
7. S/S front end caps at manifold.
8. Provide quantities and sizes required: T&S Model #HG-4VERIFY-48SK Antimicrobial Coated Hose w/NPT Male Ends, Swivel Links, 2-Piece Quick Disconnect, 90° Elbow & Installation Kit w/coiled restraining device, full port gas valve, lifetime warranty.

**ITEM NO. 172                      COMBI OVEN - DBL**

**QUANTITY 2**

**Manufacturer:** Alto Shaam  
**Model:** CTP7-20G over VMC-F4G  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Removable, single-point, quick-release, temperature probe.
2. 3" casters, set of four (4) – Two with brakes.
3. Wire rack.
4. 5032550 stacking kit.
5. Alto-Shaam non-caustic oven cleaner, case of six (6) bottles for use in VMC-F4G.
6. Automatic Tablet-based cleaning system for CTP7-20G.
7. KEC to coordinate accessories with Owner prior to ordering.
8. Smoking feature.
9. Heat Shield
10. Extended one-year warranty.

11. System installation to be reviewed by an authorized factory installer, provide report confirming installation meets factory's requirements.
12. Reverse Osmosis System to be 3M model SGLP100-CL-BP (5636204) which Includes: wall mounted with steel mounting bracket, quick disconnect plumbing, cleaning bypass assembly, & connection fittings for standard 3/4" water line. Refer to Manufacturer's Data Sheet for mounting and connection instructions. GC to provide wall blocking as required. Div. 22 to provide all interconnection tubing and components required by RO system. Copper piping to the RO System by Div. 22. Plastic pipe or reinforced opaque beverage tubing from RO System to equipment by Div. 22.
13. Provide sizes and quantities as required: Dormont s/s water disconnect from filter to steamer,color coded for filtered and non-filtered water.
14. KEC to coordinate filtered and unfiltered water with Combi Oven, do not connect filtered water to unfiltered water connection. Top combi oven requires water connections - Bottom combi does not.
15. Provide quantities and sizes required: Dormont Model #VER-KITCF-2S-48" Gas Conn. Kit, 48" long, dble. Supr-Swivel coupling with SafetyQuick safety fitting, w/coiled restraining device, full port gas valve, antimicrobial coating, lifetime warranty.
16. Water supply to have shut-off valve and back flow preventer furnished and installed by Division 22. Supply water to interconnect thru water filter and then to each oven. Indirect drain line to be ran outside of the footprint of the unit, coordinate location of the related floor sink.

**ITEM NO. 174**

**CONVEYOR OVEN**

**QUANTITY 1**

<b>Manufacturer:</b>	Lincoln
<b>Model:</b>	1116-000-U-K1835
<b>Size and Shape:</b>	Refer to drawings
<b>Alternate:</b>	Middleby Marshall

1. One (1), Two (2) ovens stacked. Three (3) ovens stacked. (choose which is required)
2. Entrance/Exit take-off shelves model 1207, exit shelf 1140 with stop lip.
3. Portable stand with casters, two (2) with brakes. (single or double) **OR** Low stand with casters, two (2) with brakes. (triple)
4. One (1) gas pressure valve for each oven.
5. Insulated S/S top.
6. Two (2) extended take-off shelves.
7. Shunt trip breakers furnished and installed by Division 26.
8. Cord and plug assembly.
9. Cap n cover utilities for future oven.
10. All table heights adjacent pizza ovens are to be adjusted to match pizza oven conveyor height.
11. Provide quantities and sizes required: T&S Model #HG-4VERIFY-48SK Antimicrobial Coated Hose w/NPT Male Ends, Swivel Links, 2-Piece Quick Disconnect, 90° Elbow & Installation Kit w/coiled restraining device, full port gas valve, lifetime warranty.

**ITEM NO. 187                      PASS-THRU HEATED CABINET- 2DR**

**QUANTITY 5**

**Manufacturer:** Traulsen  
**Model:** AHF-232WP  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Anodized aluminum interior and S/S exterior.
2. Interior lights with bulbs.
3. Exterior digital thermometer.
4. Locking hardware.
5. Universal 18" x 26" and 12" x 20" pan files on 4" centers in all sections.
6. 6" high adjustable S/S legs.
7. Furnish start-up and three (3) years repair service, including parts and labor.
8. Controls mounted on kitchen side.
9. Full height doors hinged as per plan. Stainless doors located on kitchen and server side.
10. Re-hinging feature.
11. Provide opening in wall 2" taller than equipment and 2" wider, KEC to coordinate with GC as required. Trim is not to be secured to the equipment.
12. **Special Instructions:** One (1) unit to be connected to back-up generator per TISD standards.

**ITEM NO. 188                      PASS-THRU REFRIGERATOR - 1DR**

**QUANTITY 1**

**Manufacturer:** Traulsen  
**Model:** AHT-132WPUT  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Anodized aluminum interior and S/S exterior.
2. Interior lights with bulbs.
3. Exterior digital thermometer.
4. Locking hardware.
5. Universal 18" x 26" and 12" x 20" pan files on 4" centers in all sections.
6. 6" high adjustable S/S legs.
7. Furnish start-up and three (3) years repair service, including parts and labor.
8. Controls mounted on kitchen side.
9. Five (5) Year compressor warranty.
10. Full height doors hinged as per plan. Stainless doors located on kitchen and server side.
11. Re-hinging feature.
12. Omit plug. Unit to be Hard Wired.
13. Provide opening in wall 2" taller than equipment and 2" wider, KEC to coordinate with GC as required. Trim is not to be secured to the equipment.
14. **Special Instructions:** One (1) unit to be connected to back-up generator per TISD standards.



**ITEM NO. 189**

**PASS-THRU REFRIGERATOR - 2DR**

**QUANTITY 2**

**Manufacturer:** Traulsen  
**Model:** AHT-232WPUT  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Anodized aluminum interior and S/S exterior.
2. Interior lights with bulbs.
3. Exterior digital thermometer.
4. Locking hardware.
5. Universal 18" x 26" and 12" x 20" pan files on 4" centers in all sections.
6. 6" high adjustable S/S legs.
7. Furnish start-up and three (3) years repair service, including parts and labor.
8. Controls mounted on kitchen side.
9. Five (5) Year compressor warranty.
10. Full height doors hinged as per plan. Stainless doors located on kitchen and server side.
11. Re-hinging feature.
12. Omit plug. Unit to be Hard Wired.
13. Provide opening in wall 2" taller than equipment and 2" wider, KEC to coordinate with GC as required. Trim is not to be secured to the equipment.
14. **Special Instructions:** One (1) unit to be connected to back-up generator per TISD standards.

**ITEM NO. 190**

**REACH-IN HEATED CABINET- 1DR**

**QUANTITY 2**

**Manufacturer:** Traulsen  
**Model:** AHF-132W  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Anodized aluminum interior and S/S exterior.
2. Interior lights with bulbs.
3. Exterior digital thermometer.
4. Locking hardware.
5. Universal 18" x 26" and 12" x 20" pan files on 4" centers in all sections.
6. 6" high adjustable S/S legs.
7. Furnish start-up and three (3) years repair service, including parts and labor.
8. Omit plug. Unit to be Hard Wired.
9. Full height glass doors hinged as per plan.
10. Re-hinging feature.

**ITEM NO. 191 REACH-IN HEATED CABINET- 2DR**

**QUANTITY 3**

**Manufacturer:** Traulsen  
**Model:** AHF-232W  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Anodized aluminum interior and S/S exterior.
2. Interior lights with bulbs.
3. Exterior digital thermometer.
4. Locking hardware.
5. Universal 18" x 26" and 12" x 20" pan files on 4" centers in all sections.
6. 6" high adjustable S/S legs.
7. Furnish start-up and three (3) years repair service, including parts and labor.
8. Full height glass doors hinged as per plan.
9. Re-hinging feature.

**ITEM NO. 192 REACH-IN REFRIGERATOR - 1DR**

**QUANTITY 5**

**Manufacturer:** Traulsen  
**Model:** AHT-132WUT  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Anodized aluminum interior and S/S exterior.
2. Interior lights with bulbs.
3. Exterior digital thermometer.
4. Locking hardware.
5. Universal 18" x 26" and 12" x 20" pan files on 4" centers in all sections.
6. 6" high adjustable S/S legs.
7. Furnish start-up and three (3) years repair service, including parts and labor.
8. Five (5) Year compressor warranty.
9. Omit plug. Unit to be Hard Wired.
10. Full height glass doors hinged as per plan.
11. Re-hinging feature.
12. **Special Instructions:** One (1) unit to be connected to back-up generator per TISD standards.

**ITEM NO. 197 BACK COUNTER-CLOSED BASE**

**QUANTITY 2**

**Manufacturer:** Custom Fabricated  
**Model:** ---  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Top: 14 gauge type 304 S/S, 2" turn down at free sides. 4" splash where adjacent to equipment and walls.
2. Closed base construction.
3. 16 gauge S/S intermediate shelf.
4. Double pan insulated stainless steel doors.
5. Full length 16 gauge S/S undershelf.
6. 6" S/S adjustable feet.

**ITEM NO. 201**

**SERVING COUNTER**

**QUANTITY1**

**Manufacturer:** Moduserve  
**Model:** ---  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Semi-open base counter.
2. Top: Cambria 34" high with 3 cm thickness and bull nose edges. Countertop to extend 10" past body to serve as tray slide.
3. Provide raised insulated platform in the front area of all hot food wells.
4. Countertops at all hot food wells to be recessed 1" to accommodate 18" x 26" sheet pans.
5. Seven (7) Hot/Cold built-in food wells with thermostat and manifold drain line into a common drain with individual shut-off valves.
6. Breath Protector to be single tier Elite IV with full height front glass, heat lamp and LED display lighting.
7. One (1) refrigerated cold pan located per drawings. Provide on/off switch in control panel. Provide pan insert divider strip and perforated false bottoms.
8. Breath Protector to be two tier Elite IV with full height, adjustable front glass and LED display lighting. Frost top at first shelf.
9. Provide louvered door at compressor compartments located on operator side of counter.
10. One (1) convenience outlet in each control panel. Provide one (1) outlet below counter for Beverage Merchandiser.
11. One (1) plumbing and One (1) load center compartment.
12. 16 gauge S/S undershelves.
13. One (1) T & S Model no. B0208 single pantry faucet with OC56 cast spout. One (1) T & S model no. 513 blending valve mounted on recessed panel. One (1) lot vacuum breaker and back flow preventor at each blending valve.
14. Provide waterproof grommets in counter top for each piece of equipment mounted on counter.
15. Full length Component Hardware L75 Series lights located under trayslide pre-wired to single switch located in control panel. Provided and installed by Section 114000.
16. Cashier station to be integral with counter, lockable cashier drawer, undershelf to accommodate owners POS System, outlet to accommodate POS system and data line.
17. 6" S/S legs.
18. 16 gauge S/S kick plate.
19. Prep front of counter for tile by Counter Manufacturer. Color/Pattern to be coordinated with Owner and Architect.
20. Provide S/S trim at perimeter of Beverage Merchandiser.

**ITEM NO. 203                      HEATED MERCHANDISER - 34"**

**QUANTITY 2**

**Manufacturer:** Hatco  
**Model:** HZMS-30D (slanted)  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Refer to drawings for size and location.
2. LED red accent light at support post.

**ITEM NO. 207                      REFRIGERATED AIRSCREEN**

**QUANTITY 4**

**Manufacturer:** RPI VIENNA  
**Model:** VIAS4-20-R-SQ-INS  
**Size and Shape:** Refer to drawings  
**Alternate:** Federal LMDM4878SC

1. Counter height is 34".
2. Slide-in models.
3. Rear door access.
4. 6" casters.
5. Self-contained.
6. Fold down rear work ledge.
7. Lift-up evaporator.
8. **Special Instruction:** Start-up and calibration of unit must be by factory authorized service agency, prior to customer demonstration. K.E.C. to coordinate 18" height clearance at top of unit.

**ITEM NO. 208                      HANGING HEAT LAMPS**

**QUANTITY 2**

**Manufacturer:** Hatco  
**Model:** 725RT  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Ceiling mounted retractable heat lamps.
2. Heat lamp track adapter.
3. Verify color of track and fixture assembly with architect.
4. On/off switch located on light assembly.
5. Interconnect to wall mounted light switch by Division 26.
6. Locate per drawings.
7. Coordinate with overhead furr down and serving counter as required.
8. **Special Instruction:** Section 114000 to coordinate with the General Contractor required wall blocking and electrical circuits to accept mounting of heat lamps.

**ITEM NO. 214                      CASH REGISTER**

**QUANTITY 8**

**Manufacturer:**                      Owner Furnished  
**Model:**                                      ---  
**Size and Shape:**                      Refer to drawings  
**Alternate:**                                      ---

**ITEM NO. 215                      GUIDE RAIL**

**QUANTITY 10**

**Manufacturer:**                      Custom Fabricated  
**Model:**                                      ---  
**Size and Shape:**                      Refer to drawings  
**Alternate:**                                      ---

1. 1-5/8" O.D. stainless steel tubular guide rails with 1-5/8" uprights set in sleeves set in concrete at maximum 4'-0" on center.
2. Top of rails to be 34" A.F.F. for high schools.
3. Section 114000 to coordinate guide rails with ADA requirements.

**ITEM NO. 217                      SERVING COUNTER**

**QUANTITY 1**

**Manufacturer:**                      Moduserve  
**Model:**                                      ---  
**Size and Shape:**                      Refer to drawings  
**Alternate:**                                      ---

1. Semi-open base counter.
2. Top: Cambria 34" high with 3 cm thickness and bull nose edges. Countertop to extend 10" past body to serve as tray slide.
3. Provide raised insulated platform in the front area of all hot food wells.
4. Countertops at all hot food wells to be recessed 1" to accommodate 18" x 26" sheet pans.
5. Seven (7) Hot/Cold built-in food wells with thermostat and manifold drain line into a common drain with individual shut-off valves.
6. Breath Protector to be single tier Elite IV with full height front glass, heat lamp and LED display lighting.
7. One (1) Heat through stone section.
8. One (1) modified hot food breath protector with mirror finish with 1" round post. Post to be vertical front post only with slight angle towards rear of counter. Self-service height temper glass to be fixed mounted to angle section of post. No heat lamp or display light.
9. One (1) refrigerated cold pan located per drawings. Provide on/off switch in control panel. Provide pan insert divider strip and perforated false bottoms.
10. Breath Protector to be two tier Elite IV with full height, adjustable front glass and LED display lighting. Frost top at first shelf.
11. Provide louvered door at compressor compartments located on operator side of counter.

12. One (1) convenience outlet in each control panel. Provide one (1) outlet below counter for Beverage Merchandiser.
13. One (1) plumbing and One (1) load center compartment.
14. 16 gauge S/S undershelves.
15. One (1) T & S Model no. B0208 single pantry faucet with OC56 cast spout. One (1) T & S model no. 513 blending valve mounted on recessed panel. One (1) lot vacuum breaker and back flow preventor at each blending valve.
16. Provide waterproof grommets in counter top for each piece of equipment mounted on counter.
17. Full length Component Hardware L75 Series lights located under trayslide pre-wired to single switch located in control panel. Provided and installed by Section 114000.
18. Cashier station to be integral with counter, lockable cashier drawer, undershelf to accommodate owners POS System, outlet to accommodate POS system and data line.
19. 6" S/S legs.
20. 16 gauge S/S kick plate.
21. Prep front of counter for tile by Counter Manufacturer. Color/Pattern to be coordinated with Owner and Architect.
22. Provide S/S trim at perimeter of Beverage Merchandiser.

**ITEM NO. 218                      SERVING COUNTER**

**QUANTITY 1**

**Manufacturer:** Moduserve  
**Model:** ---  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Semi-open base counter.
2. Top: Cambria 34" high with 3 cm thickness and bull nose edges. Countertop to extend 10" past body to serve as tray slide.
3. Provide raised insulated platform in the front area of all hot food wells.
4. Countertops at all hot food wells to be recessed 1" to accommodate 18" x 26" sheet pans.
5. Seven (7) Hot/Cold built-in food wells with thermostat and manifold drain line into a common drain with individual shut-off valves.
6. Breath Protector to be single tier Elite IV with full height front glass, heat lamp and LED display lighting.
7. One (1) Heat through stone section.
8. One (1) modified hot food breath protector with mirror finish with 1" round post. Post to be vertical front post only with slight angle towards rear of counter. Self-service height temper glass to be fixed mounted to angle section of post. No heat lamp or display light.
9. One (1) refrigerated cold pan located per drawings. Provide on/off switch in control panel. Provide pan insert divider strip and perforated false bottoms.
10. Breath Protector to be two tier Elite IV with full height, adjustable front glass and LED display lighting. Frost top at first shelf.
11. Provide louvered door at compressor compartments located on operator side of counter.
12. One (1) convenience outlet in each control panel. Provide one (1) outlet below counter for Beverage Merchandiser.
13. One (1) plumbing and One (1) load center compartment.

14. 16 gauge S/S undershelves.
15. One (1) T & S Model no. B0208 single pantry faucet with OC56 cast spout. One (1) T & S model no. 513 blending valve mounted on recessed panel. One (1) lot vacuum breaker and back flow preventor at each blending valve.
16. Provide waterproof grommets in counter top for each piece of equipment mounted on counter.
17. Full length Component Hardware L75 Series lights located under trayslide pre-wired to single switch located in control panel. Provided and installed by Section 114000.
18. Cashier station to be integral with counter, lockable cashier drawer, undershelf to accommodate owners POS System, outlet to accommodate POS system and data line.
19. 6" S/S legs.
20. 16 gauge S/S kick plate.
21. Prep front of counter for tile by Counter Manufacturer. Color/Pattern to be coordinated with Owner and Architect.
22. Provide S/S trim at perimeter of Beverage Merchandiser.

**ITEM NO. 219**

**SERVING COUNTER**

**QUANTITY 1**

**Manufacturer:** Moduserve  
**Model:** ---  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Semi-open base counter.
2. Top: Cambria 34" high with 3 cm thickness and bull nose edges. Countertop to extend 10" past body to serve as tray slide.
3. Provide raised insulated platform in the front area of all hot food wells.
4. Countertops at all hot food wells to be recessed 1" to accommodate 18" x 26" sheet pans.
5. Seven (7) Hot/Cold built-in food wells with thermostat and manifold drain line into a common drain with individual shut-off valves.
6. Breath Protector to be single tier Elite IV with full height front glass, heat lamp and LED display lighting.
7. One (1) refrigerated cold pan located per drawings. Provide on/off switch in control panel. Provide pan insert divider strip and perforated false bottoms.
8. Breath Protector to be two tier Elite IV with full height, adjustable front glass and LED display lighting. Frost top at first shelf.
9. Provide louvered door at compressor compartments located on operator side of counter.
10. One (1) convenience outlet in each control panel. Provide one (1) outlet below counter for Beverage Merchandiser.
11. One (1) plumbing and One (1) load center compartment.
12. 16 gauge S/S undershelves.
13. One (1) T & S Model no. B0208 single pantry faucet with OC56 cast spout. One (1) T & S model no. 513 blending valve mounted on recessed panel. One (1) lot vacuum breaker and back flow preventor at each blending valve.
14. Provide waterproof grommets in counter top for each piece of equipment mounted on counter.
15. Full length Component Hardware L75 Series lights located under trayslide pre-wired to single switch located in control panel. Provided and installed by Section 114000.

16. Cashier station to be integral with counter, lockable cashier drawer, undershelf to accommodate owners POS System, outlet to accommodate POS system and data line.
17. 6" S/S legs.
18. 16 gauge S/S kick plate.
19. Prep front of counter for tile by Counter Manufacturer. Color/Pattern to be coordinated with Owner and Architect.
20. Provide S/S trim at perimeter of Beverage Merchandiser.

**ITEM NO. 249                      THREE COMPARTMENT SINK**

**QUANTITY 1**

**Manufacturer:** Custom Fabricated  
**Model:** ---  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Top: 14-gauge S/S 3" high 1-1/2" rolled rim at free sides, 10" high splash at walls.
2. Open base construction.
3. Omit rear rail at sink.
4. Three (3) 30" x 26" x 15" deep sink compartment.
5. Two (2) T&S model no. B-0291, splash mount faucet, 18" swing nozzle, LL inlets, for 3/4" hot and cold water connections.
6. Three (3) Fisher 22306 twist waste valve 3 1/2" x 2" with overflow and tailpiece. Provide 18 gauge S/S bracket for drain handle welded to sink bottom.
7. 12" deep single post mounted perforated overshelf mounted at 18" above counter top.
8. 18-gaugebutt joint wall panel from splash to underside of shelf.
9. Post mounted utensil rack, extend 1-5/8" diameter S/S post from back splash, turn forward 12" and weld full length x 2" x 1/4" S/S bar with Component Hardware model no. V-77-4401 S/S sliding hooks at 8" on center.
10. 16-gauge S/S undershelf as per drawings.
11. Flanged feet at front only of counter.
12. Anchor flanged feet to floor with non-corrosive bolts. Secure wall mounted equipment / components to in wall grounds or anchor plates. Coordinate installation with the general contractor.

**ITEM NO. 250                      DISHMACHINE**

**QUANTITY 1**

**Manufacturer:** Hobart  
**Model:** CL44eN-BAS  
**Size and Shape:** Refer to drawings  
**Alternate:** Champion

1. Dishwasher, conveyor type, single tank design, 202 racks/hour capacity, S/S construction, with automatic fill, auto timer, and 115 volt pilot circuit.
2. 15 KW Electric tank heat.



3. Verify direction of dishmachine with drawings.
4. One (1) Extended warranty - One (1) Year parts and labor.
5. Interior Chamber height to be 4" taller than standard.
6. Single point electrical connection for Motors, Controls and Tank Heat. Div. 26 to provide S/S disconnect switches located as per plans interconnected to dishmachine and external booster heater.
7. Two (2) vent cowls with 4 x 16 vent and damper. Provide 18 gauge stainless steel seamless duct risers 6" above finish ceiling for final connection. The duct: trimmed at ceiling with 16 gauge stainless steel flange with all corners welded.
8. One (1) table limit switch with stainless steel cover to conceal back. Provided by Manufacturer / Installed by Div. 26.
9. Four (4) 20"x20" Peg racks.
10. Four (4) 20" x 20" sheet pan racks.
11. Two (2) 20" x 20" combination racks.
12. Vent fan controls.
13. Drain water tempering kit. Drain water tempering kit is to be installed by Hobart Service.
14. Peak Rate of drain flow = 38 gpm. Division 22 to provide and install backflow preventor between booster heater and filter. Final connection by Division 22. Coordinate location of electrical disconnects on free wall.

**ITEM NO. 252                      BOOSTER HEATER**

**QUANTITY 1**

**Manufacturer:** Hatco  
**Model:** C-30  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Compact booster heater.
2. One (1) Brass Pressure Reducing Valve with By-Pass.
3. 6" adjustable S/S legs.
4. One (1) Phosphate water treatment unit. System to be in an accessible location.
5. One (1) Shock Absorber.
6. S/S body and base.
7. Division 22 to provide and install backflow preventor between booster heater and filter. Final connection by Division 22. Interconnect to dishmachine by Division 22. Coordinate location of electrical disconnects on free wall. GC to insulate hot water from booster heater to dishmachine.

**ITEM NO. 255                      MOBILE UTENSIL SHELF**

**QUANTITY 9**

**Manufacturer:** Cambro  
**Model:** Camshelving Premium  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Four (4) tier, includes two (2) drop-ins and (1) cutting board/tray drying rack, built in Microban antimicrobial product protection.
2. Four (4) 75" high posts.
3. Two (2) no. 5MPX casters per unit.
4. Two (2) no. 5MPBX locking casters per unit.
5. Two (2) bottom shelves equipped with sheet pan drying rack assemblies.

**ITEM NO. 260**

**HAND SINK**

**QUANTITY 10**

**Manufacturer:** Advance Tabco  
**Model:** 7-PS-50  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. 20 gauge stainless steel construction.
2. Basket drain and wall bracket.
3. Gooseneck faucet with wrist handles.
4. Soap and towel dispensers by Owner.
5. P-Trap assembly, delete open/close drain valve.
6. Custom fabricated removable end splashes on sides as required by code. height same as rear splash.
7. Trade contractor to provide temperature adjustment valves as required.

**ITEM NO. 265**

**40 GALLON TILT KETTLE**

**QUANTITY 1**

**Manufacturer:** Groen  
**Model:** DH-40A  
**Size and Shape:** Refer to drawings  
**Alternate:** Cleveland

1. Kettle, Gas, Tilting, 40-gallon capacity, 2/3 steam jacket design, floor mounted control console supports, s/s exterior finish, std w/flanged feet.
2. Stainless steel.
3. Food strainer.
4. Hot and cold faucet.
5. Faucet mounting bracket.
6. Kettle markings.
7. Hinged cover model #51.
8. Kettle accessory kit.
9. Provide quantities and sizes required: T&S Model #HG-4VERIFY-48SK Antimicrobial Coated Hose w/NPT Male Ends, Swivel Links, 2-Piece Quick Disconnect, 90° Elbow & Installation Kit w/coiled restraining device, full port gas valve, lifetime warranty. Alternate: Dormont
10. Provide sizes and quantities as required: T&S Model #HW-6VERIFY-48 water disconnect. Alternate: Dormont

11. Trench Liner to consist of:
12. S/S trench liner by 114000. Installation by G.C.
13. Custom Fabricated or IMC/Teddy.
14. IKG grating type "D".
15. 1-1/2" x 3/16" bearing bars and perimeter frame. Provide in two (2) pieces.
16. 14 gauge s/s liner.
17. Klein no. 1834-1010-100 basket drain.
18. Klein no. 1870-1001-3251 safety chain.
19. Location of trench liner is critical. G.C. and 114000 to verify location prior to concrete pour.  
Recommend block out of trench liner area.

**ITEM NO. 614**

**FILL FAUCET**

**QUANTITY 3**

**Manufacturer:** T & S  
**Model:** B-0610  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Pot Filler Faucet, splash-mounted, 8" centers, vacuum breaker, flexible S/S hose, 60" long, hooked nozzle with self-closing valve, 1/2" IPS female inlets, built-in check valves.
2. 12" square 12 ga. S/S wall plate with hose rack with radius corners.
3. Install at 48" A.F.F. by Division 22. Coordinate height of backflow preventor with highest water level of associated equipment.

**ITEM NO. 615**

**MENU MONITOR**

**QUANTITY 5**

**Manufacturer:** OWNER FURNISHED / CONTRACTOR INSTALLED  
**Model:** ---  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

**ITEM NO. 646**

**CUP DISPENSER**

**QUANTITY 2**

**Manufacturer:** Dispense Rite  
**Model:** CTC-L-3SS  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Stainless steel exterior.
2. Condiment tray mounted above each unit.

**ITEM NO. 647                      TEA/COFFEE BREWER**

**QUANTITY 2**

**Manufacturer:** Bunn  
**Model:** ITB w/TDO 4 Dispenser  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Tea/Coffee Brewer with Tray, dual voltage adaptable.
2. Digital readout displays in English/Spanish/French.
3. Infusion Series technology: (3) brew buttons & (2) batch sizes, BrewWISE® intelligence with pre-infusion & pulse brew, energy-saver mode, brew counter.
4. Includes integrated (3) position flip tray, overlay kit for customization.
5. USB programming capable.
6. Three (3) TDO-5 Brew Thru Reservoir, Two 2.5 Airpots.
7. Inline water filtration as recommended by manufacturer. Field verify installation (out of sight) below countertop where possible.
8. Dormont Water quick disconnects.
9. Locate per drawings.
1. ice maker.
2. Cord and plug assembly, NEMA 5-20.
3. Coordinate installation into counter.
4. 5000 BTU/hr heat rejection.

**ITEM NO. 803                      SET UP TABLE**

**QUANTITY 1**

**Manufacturer:** Custom Fabricated  
**Model:** ---  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

**CULINARY & FLORAL COOLER**

**ITEM NO. 901                      DEMO COUNTER**

**QUANTITY 2**

**Manufacturer:** Custom Fabrication  
**Model:** ---  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Top: 14 gauge S/S top with 2" turndown at free sides.
2. Open base construction.
3. Four (4) casters, two (2) with brakes.
4. Refer to shop drawings for final review.

ITEM NO. 902

COLD STORAGE ASSEMBLY - FUTURE

QUANTITY 1

**Manufacturer:** American Panel  
**Model:** ---  
**Size and Shape:** Refer to drawings  
**Alternate:** Thermokool, Bally, Kolpak

1. Installation to be completed by Jack Horton or Approved Authorized Installer. **Installation to be completed by Factory Approved / Authorized installer. Refer to Section 2.33 Submittal drawings to include factory approval letter or certificate.**
2. Manufacturer to review final installation and provide a letter confirming installation meets manufacturer requirements.
3. Assembly to have 9'-6" interior clearance.
4. 304 #3 finish 20 gauge stainless steel finish where exposed, 20 gauge galvanized steel where concealed.
5. Factory floor with smooth aluminum finish, recessed in slab 8 1/2". Secure floor to wall assembly with cam-lock assembly. KEC to ensure the floor assembly is level prior to the wearing bed installation. Kitchens finished floor to extend to walk-in.
6. Factory floor with diamond treadplate finish, recessed in slab 4". Provide reinforced super floor with 3/4" marine grade plywood foamed in place at the factory with fiberglass reinforced plastic structural grid and a stainless steel floor. Installation to meet all NSF and UL listings.
7. Reinforced 36" internal ramp integral to floor assembly.
8. Threshold to be smooth and level with finished floor. - **Critical.**
9. Interior walls to be .040" aluminum, white embossed texture on walls.
10. Ceiling to be embossed textured .040" aluminum baked white enamel.
11. Two (2) 36" doors. Doors to be 18 gauge stainless steel, type 304 (18-8), #3 finish, with heated perimeter / door jambs / windows and threshold heaters. Each door to be equipped with 3'-0" high diamond tread kick plate on both sides of doors. Mount hinged doors on two (2) Kason model no. 1346 (or equal); polished chrome plated nylon cam-lift hinges.
12. Provide an illuminated Push Button and Entrapment alarm within cooler and freezer, interconnected to Edwards 860 Series Strobe Beacons (or equal), in Kitchen above freezer and Cafetorium (Verify Location). (Strobe Beacons by Div. 26). Alarm to notify facility personnel of activation based on district/owner requirements.
13. Provide Kason model no. 0487 Frost Free Inside release (or equal). Fiberglass rod and plastic flange, with safety glow plastic knob, ADA compliant.
14. Manual backup vacuum release mechanism to punch hole in wall assembly to release vacuum within freezer assembly. Mechanism to include a pull-down handle with freeze-proof hand grip. Handle to have the ability to penetrate and/or punch hole in wall accordingly to assist with opening of door assembly in the event of entrapment (and failure of Frost free inside release button). Wall panel to include a knockout section to assist with requirements. Release mechanism assembly to be built-in/mounted to the door assembly structural frame to minimize mechanism tear-out and/or failure. Handle to be painted yellow with phenolic label "Vacuum Pressure Release".

15. Adjust door height as required to accommodate mobile interior shelving.
16. 18 gauge stainless steel, type 304 (18-8), #3 finish trim where adjacent to walls and enclosure panels that extend to 2" above finished ceiling.
17. Freezer One (1) lot LED light fixtures to operate in temperatures to -20 F. **Lights to be installed perpendicular to coils.**
18. Refrigerator- One (1) lot LED light fixtures. Lights to be installed perpendicular to coils.
19. 3'-0" high diamond tread plate at exposed exterior surfaces. Fasten to wall with stainless steel fasteners.
20. Provide door bumper at doors.
21. Compartments to be have all electrical concealed within the walls or located above the ceiling.
22. Coordinate wall opening size with door assembly.
23. 18 gauge stainless steel, type 304 (18-8), #3 finish, wrap wall opening at door assembly.
24. Provide Manufacturers alarm/control system that includes hi/low limits . Route temperature sensor to be located to the side of evaporator coil. (Verify with District preference).
25. Doors to be provided with CCI Industries, Inc., Clear-VU swinging door assemblies. (NOT REQUIRED IF ITEM 116 AIR SHIELD IS SPECIFIED.)
26. **(PM Only applies if tile floors are being provided:)** K.E.C. to provide aluminum coved base to interior of assembly. Provide sealant between floor and wall panels.
27. All holes in assembly to be sealed by factory installer.
28. 6" oversized heated Pressure Relief Port with red indicator light to confirm electrical interconnection. Locate 12" below ceiling on cooler/freezer common wall and on cooler wall. Additional Heated Relief Port to be provided on freezer door and interconnected to door assembly electrical. Locate upper corner of hinged side of door.
29. Standalone Freezer assembly to have 6" oversized Heated pressure relief ports located 12" below ceiling and mounted in the door frame assembly.
30. KEC to field verify all horizontal/vertical measurements and conditions at the building prior to fabrication or delivery of equipment.
31. KEC to provide 1 year walk-in panel installation warranty. KEC is responsible for overall install accuracy/quality and quality control of work performed regardless of installer or any field modifications due to building/construction conditions. KEC to provide Letter of Install Approval to FDP upon completed install.
32. Manufacturer to provide One Year Parts and Labor Warranty.
33. Interwiring of temperature monitor panel to master building alarm system or to the Owner's network. Technology department to provide all interfacing of alarm system and with the building alarm system. Conduit from refrigeration system to monitor by Division 26. Temperature Monitor installation at 4'-0" above finished floor. All conduit to be located above walk-in cooler/freezer ceiling. Exposed electrical conduit is not acceptable. Threshold to be smooth and level need to be moved up just after last flooring option line.
34. Manufacturer Representative to provide training on controls and inside emergency release mechanisms.

**ITEM NO. 903A                      COLD STORAGE REFRIGERATION SYSTEM**

**QUANTITY 1**

**Manufacturer:** RDT  
**Model:** ZS1-2 EcoSmart  
**Size and Shape:** Refer to drawings  
**Alternate:** Cold Zone

1. Air cooled system.
2. Cooler temperature to be +35 degrees.
3. Freezer temperature to be -10 degrees.
4. EcoSmart system on demand defrost.
5. KE2 Controllers located per Owner requirements.
6. S/S covered housing.
7. All exterior piping to be aluminum wrapped.
8. System to accommodate Item No. 902 Cold Storage Assembly.
9. Unit to be located on roof. Refer to Architectural and Engineering drawings for exact location of remote unit. Coordinate routing of refrigeration lines and conduit with appropriate trades. Heat tape and insulate all drain lines. General Contractor to seal all building penetrations at refrigeration lines.
10. **Special Instruction:** Unit to be connected to back-up generator per TISD standards.

**ITEM NO. 903B                      COLD STORAGE REFRIGERATION SYSTEM**

**QUANTITY 1**

**Manufacturer:** RDT  
**Model:** ZS1-2 EcoSmart  
**Size and Shape:** Refer to drawings  
**Alternate:** Cold Zone

1. Air cooled system.
2. Cooler temperature to be +35 degrees.
3. Freezer temperature to be -10 degrees.
4. EcoSmart system on demand defrost.
5. KE2 Controllers located per Owner requirements.
6. S/S covered housing.
7. All exterior piping to be aluminum wrapped.
8. System to accommodate Item No. 102 Cold Storage Assembly.
9. S/S covered housing mounted to a 36" tall 1/8 galvanized angle iron frame anchored to concrete pad. Provide S/S skirting around frame.
10. Mount condensing unit on common exterior rack. Refer to Architectural and Engineering drawings for exact location of remote unit. Coordinate routing of refrigeration lines and conduit with appropriate trades. Heat tape and insulate all drain lines. General Contractor to seal all building penetrations at refrigeration lines.
11. **Special Instruction:** Unit to be connected to back-up generator per TISD standards.

**ITEM NO. 904                      COLD STORAGE SHELVING - QTY 2 FUTURE**

**QUANTITY 3**

**Manufacturer:** Cambro  
**Model:** Camshelving Premium  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Each unit to be four (4) tiers high with open grid mats.
2. Four (4) 74" post per unit. Provide foot plates at all posts when assembly is supplied with walk-in floor.
3. Refer to drawings for size, width and lengths.
4. Quantity Two (2) to equal One (1) lot: all shelving shown within cold storage assembly.
5. Verify shelving requirements with approved submittal prior to ordering.

**ITEM NO. 907                      DRY STORAGE SHELVING - FUTURE**

**QUANTITY 1**

**Manufacturer:** Cambro  
**Model:** Camshelving Premium  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Each unit to be five (5) tiers high with open grid shelving.
2. Four (4) 86" posts per unit.
3. Quantity One (1) to equal One (1) Lot: all shelving shown within the dry storage room.
4. Refer to drawings for size, width and lengths.
5. Verify shelving requirements with approved submittal prior to ordering.
6. Provide four (4) Can Storage Rack model CR24E, each accommodates (8) #10 cans or (12) #5 cans, corrosion-resistant, taupe epoxy finish, compatible with MetroMax® i, MetroMax® Q, & Super Erecta Pro shelves.

**ITEM NO. 909                      ICE MACHINE - FUTURE**

**QUANTITY 1**

**Manufacturer:** Hoshizaki  
**Model:** KML-500MAJ/B-500  
**Size and Shape:** Refer to drawings  
**Alternate:** Manitowoc

1. Stainless steel bin.
2. Stainless steel legs.
3. Provide bin adapter kit as required.
4. Provide Luminice II Virus and Bacteria Inhibitor.
5. Provide sizes and quantities as required: T&S model #HW-6VERIFY-48 water hose and disconnect from filter to Ice Machine.
6. KEC to coordinate routing of water lines from the ice machine to the remote water filter system.



7. One (1) pre-filter and water filter sized to manufactures recommendations. Mount on wall adjacent to ice machine in an easily accessible location.
8. Coordinate cord and cap with receptacle. Water supply to filter to be hard copper plumbed. 60" long flex hose from filter to ice maker. Interconnection thru water filter to ice machine and final connection by Division 22. Water filter overflow tube to be strapped to back side of ice machine and extend to 1" above floor sink.

**ITEM NO. 910                      STACKED WASHER/DRYER - FUTURE**

**QUANTITY 1**

<b>Manufacturer:</b>	Owner Furnished
<b>Model:</b>	---
<b>Size and Shape:</b>	Refer to drawings
<b>Alternate:</b>	---

1. Washer:
2. 2.0 cubic ft. capacity.
3. Straight vane agitator.
4. 7 cycles, 2-speed.
5. 4 water temperatures.
6. "Quick pak" sound insulation.
7. Color to be white.
8. Water and drain hoses.
9. Dryer:
10. 3.4 cubic ft. capacity.
11. 4 cycles plus Air only.
12. Auto dry.
13. Wrinkle Guard 1.
14. Color to be white.
15. To include dryer cord and vent kit.
16. Units to include model stationary assembly including: white stack stand, dryer wall mount kit, door latch kit.
17. Verify utility requirements with owner/operator. Models at time of delivery shall be the current models numbers.

**ITEM NO. 913                      FLORAL COOLER**

**QUANTITY 1**

<b>Manufacturer:</b>	American Panel
<b>Model:</b>	---
<b>Size and Shape:</b>	Refer to drawings
<b>Alternate:</b>	Thermokool, Bally, Kolpak

1. Installation to be completed by Jack Horton or Approved Authorized Installer. **Installation to be completed by Factory Approved / Authorized installer. Refer to Section 2.33 Submittal drawings to include factory approval letter or certificate.**

2. Manufacturer to review final installation and provide a letter confirming installation meets manufacturer requirements.
3. Assembly to have 9'-6" interior clearance.
4. 304 #3 finish 20 gauge stainless steel finish where exposed, 20 gauge galvanized steel where concealed.
5. Threshold to be smooth and level with finished floor. - **Critical.**
6. Interior walls to be .040" aluminum, white embossed texture on walls.
7. Ceiling to be embossed textured .040" aluminum baked white enamel.
8. Floorless Assembly with screeds secured to slab.
9. One (1) 36" door. Doors to be 18 gauge stainless steel, type 304 (18-8), #3 finish, with heated perimeter / door jambs / windows and threshold heaters. Each door to be equipped with 3'-0" high diamond tread kick plate on both sides of doors. Mount hinged doors on two (2) Kason model no. 1346 (or equal); polished chrome plated nylon cam-lift hinges.
10. Provide an illuminated Push Button and Entrapment alarm within cooler and freezer, interconnected to Edwards 860 Series Strobe Beacons (or equal), in Kitchen above freezer and Cafetorium (Verify Location). (Strobe Beacons by Div. 26). Alarm to notify facility personnel of activation based on district/owner requirements.
11. Provide Kason model no. 0487 Frost Free Inside release (or equal). Fiberglass rod and plastic flange, with safety glow plastic knob, ADA compliant.
12. Manual backup vacuum release mechanism to punch hole in wall assembly to release vacuum within freezer assembly. Mechanism to include a pull-down handle with freeze-proof hand grip. Handle to have the ability to penetrate and/or punch hole in wall accordingly to assist with opening of door assembly in the event of entrapment (and failure of Frost free inside release button). Wall panel to include a knockout section to assist with requirements. Release mechanism assembly to be built-in/mounted to the door assembly structural frame to minimize mechanism tear-out and/or failure. Handle to be painted yellow with phenolic label "Vacuum Pressure Release".
13. All conduit to be exposed. No ceiling penetrations.
14. 18 gauge stainless steel, type 304 (18-8), #3 finish trim where adjacent to walls and enclosure panels that extend to 2" above finished ceiling.
15. Refrigerator- One (1) lot LED light fixtures. Lights to be installed perpendicular to coils.
16. 3'-0" high diamond tread plate at exposed exterior surfaces. Fasten to wall with stainless steel fasteners.
17. Provide door bumper at doors.
18. Provide Manufacturers alarm/control system that includes hi/low limits . Route temperature sensor to be located to the side of evaporator coil. (Verify with District preference).
19. Doors to be provided with CCI Industries, Inc., Clear-VU swinging door assemblies.
20. All holes in assembly to be sealed by factory installer.
21. KEC to field verify all horizontal/vertical measurements and conditions at the building prior to fabrication or delivery of equipment.
22. KEC to provide 1 year walk-in panel installation warranty. KEC is responsible for overall install accuracy/quality and quality control of work performed regardless of installer or any field

modifications due to building/construction conditions. KEC to provide Letter of Install Approval to FDP upon completed install.

23. Manufacturer to provide One Year Parts and Labor Warranty.
24. Interwiring of temperature monitor panel to master building alarm system or to the Owner's network. Technology department to provide all interfacing of alarm system and with the building alarm system. Conduit from refrigeration system to monitor by Division 26. Temperature Monitor installation at 4'-0" above finished floor. All conduit to be located above walk-in cooler/freezer ceiling. Exposed electrical conduit is not acceptable.
25. Manufacturer Representative to provide training on controls and inside emergency release mechanisms.

**ITEM NO. 921**

**TWO COMPARTMENT SINK - QTY 2 FUTURE**

**QUANTITY 4**

<b>Manufacturer:</b>	Custom Fabricated
<b>Model:</b>	---
<b>Size and Shape:</b>	Refer to drawings
<b>Alternate:</b>	---

1. Top: 14 gauge type 304 S/S marine edge with 2" turndown at free sides.
2. Open base construction.
3. 10" high splash where adjacent to walls/fixtures.
4. Two (2) 24" x 26" x 15" deep sink compartments.
5. One (1) T&S model no. B-0291, splash mount faucet, 18" swing nozzle, LL inlets, for ¾" hot and cold water connections.
6. Two (2) Fisher 22306 twist waste valve 3 1/2" x 2" with overflow and tailpiece. Provide 18 gauge S/S bracket for drain handle welded to sink bottom.
7. Provide One (1) T&S model no. B-0133-EE-CR-8C pre-rinse, **two (2)** B-0108-C spray head, two(2) B-0109-04 18" long wall bracket (dealer to cut to correct length), one (1) additional spray face model no. 108SFRK with ceramic cartridges.
8. 16 gauge S/S undershelf per drawings.
9. 12" deep single post mounted perforated overshelf at 18" above counter top, punched to accommodate spray rinse.
10. Post mounted utensil rack, extend 1-5/8" diameter S/S post from back splash, turn forward 12" and weld full length x 2" x ¼" S/S bar with Component Hardware model no. V-77-4401 S/S sliding hooks at 8" on center. Verify height with owner.
11. One (1) Chicago model no. 305-VBRCF hose bibb and rack mounted on 12 gauge S/S bracket ground and polished to match top. Hose and spray nozzle by owner.
12. Omit rear rail at sink compartments, disposer and front rail at hose bibb.
13. Two (2) "Richlite" ½" thick removable sink covers installed at each sink. Weld ¼" bar stock, set 5/8" below work surface at all four corners for support of sink covers. Two (2) finger holes per board.
14. Provide top and bottom c-channel support storage for sink covers at right or left end of counter.
15. One (1) Edlund model no. S-11 Manual can opener, mounted on raised platform.

16. Flanged feet at front only.
17. Seal at all splash penetrations.

**ITEM NO. 922                      GRIDDLE - FUTURE**

**QUANTITY 2**

**Manufacturer:** Vulcan  
**Model:** 948RX  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Igniter and Flame Safety features.
2. Natural gas.
3. Provide quantities and sizes required: T&S Brass Model# HG-4D-48SK. Gas connection 48" long with male to Quick Disconnect with SwiveLink, 360 degree, fittings for both hose ends. Quick disconnect to be located at the appliance. Installation kit includes restraining cable. Hose to be Hydro-Formed corrugated 321 series stainless steel. Hose ends to be welded and outer coating to be extruded. Diameter and length to be determined by requirements of specific equipment. 5 year warranty. Restraining device: heavy duty steel cable, fastened to equipment and walls, 3" to 6" shorter than equipment connector length.

**ITEM NO. 923                      DISPOSER 3 HP - FUTURE**

**QUANTITY 1**

**Manufacturer:** Salvajor  
**Model:** 200-CA-18-ARSS -LD  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Fixed nozzle.
2. Delete standard syphon breakers and provide T & S B-0456-04 vacuum breakers and mount 6" from tabletop to base of breaker.
3. Solenoid valve.
4. Flow control.
5. Model no. ARSS-LD control panel.
6. Auto-reverse.
7. Dejamming tool.
8. Install vacuum breaker in splash
9. S/S cone cover.
10. Perforated silver saver and disposer cone with scrap ring.
11. Two (2) Swirl inlet located in disposer cone at a 45 degree angle.
12. GC to pipe 1/2" cold water to disposer body and swirl inlets. Excess electrical cord to be secured to fabrication as required. Install into counter by section 114000.

**ITEM NO. 924                      REFRIGERATED BASE - FUTURE**

**QUANTITY 2**

**Manufacturer:** Delfield  
**Model:** F17C52  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Stainless steel front, sides, drawers and grille. Stainless steel back
2. Stainless steel interior
3. Full electronic control
4. 6" Casters, 2 with brakes.
5. Lifetime warranty on all drawers and slides

**ITEM NO. 929                      WORKTABLE W/S.BAR UT.RACK - FUTURE**

**QUANTITY 6**

**Manufacturer:** Custom Fabricated  
**Model:** ---  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Top: 14 gauge type 304 S/S, 2" turn down at free sides.
2. Open base construction.
3. 16 gauge S/S undershelf.
4. Two (2) 20" W x 20" L drawer assemblies. Component Hardware #S52-2020 drawer slides with delrin bearings - 200lb capacity. Component Hardware #S80-2020 drawer pan.
5. Flanged feet.
6. Post mounted utensil rack, extend 1-5/8" diameter S/S post from cross rail, thru top to 78" A.F.F. and weld full length x 2" x 1/4" S/S bar with Component Hardware model no. V-77-4401 S/S sliding hooks at 8" on center. Verify height with Owner.
7. Provide a duplex receptacle and housing mounted below countertop per drawings. Interconnect and prewire a 5'-0" cord and plug out of receptacle housing for plugging into ceiling drop cord receptacle. 114000 and Div. 26 to coordinate location of drop cord receptacle.

**ITEM NO. 932                      SIX BURNER RANGE - FUTURE**

**QUANTITY 2**

**Manufacturer:** Vulcan  
**Model:** 36S-6B  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Standard oven with two (2) oven racks.
2. Stainless steel front, sides,
3. 3/4" rear gas connection.
4. 10" high stainless steel backguard.

5. Heavy duty casters, two (2) with brakes.
6. Provide quantities and sizes required: T&S Model #HG-4VERIFY-48SK Antimicrobial Coated Hose w/NPT Male Ends, Swivel Links, 2-Piece Quick Disconnect, 90° Elbow & Installation Kit w/coiled restraining device, full port gas valve, lifetime warranty.

**ITEM NO. 936**

**BAKER'S TABLE - FUTURE**

**QUANTITY 2**

**Manufacturer:** Custom Fabricated  
**Model:** ---  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Top: 14 gauge type 304 S/S with 2" square turn down at front, 6" high enclosed splash at sides and rear.
2. 1-1/2" thick hard maple tabletop with 2" drop edge at all sides by John Boos.
3. Provide finished back at exposed backsplash.
4. 12" deep post mounted overshell at 18" above counter top.
5. Post mounted utensil rack, extend 1-5/8" diameter S/S post from back splash, turn forward 12" and weld full length x 2" x 1/4" S/S bar with Component Hardware model no. V-77-4401 S/S sliding hooks at 8" on center. Verify height with owner.
6. 18 gauge butt joint wall panel from splash to underside of shelf.
7. 12" deep saddle mount overshell (for hard maple tabletop.)
8. 16 gauge S/S flour trough.
9. Rear rail only.
10. One (1) lot Rubbermaid no. FG360288WHT ingredient bins.
11. One (1) tier of three (3) 20" x 20" x 5" deep all stainless steel drawers. To be in #18 gauge stainless steel housing having 3/4" radius (vertical) exterior corners.

**ITEM NO. 939**

**INSUL MOBILE PROOFER - FUTURE**

**QUANTITY 2**

**Manufacturer:** CresCor  
**Model:** H-137-WSUA-12D  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Insulated proofer/heated cabinet.
2. Field reversible doors.
3. Adjustable universal angles.
4. Four (4) 5" casters, two (2) with brakes.
5. Tempered glass door windows.
6. Key lock handle.
7. Corner bumpers.
8. Cord and plug. Coordinate NEMA configuration with Electrician.
9. Thermometer.

10. 1500 watt heater.

**ITEM NO. 944                      FRYER - FUTURE**

**QUANTITY 2**

**Manufacturer:** Frymaster  
**Model:** MJ140  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. 40lb oil capacity.
2. S/S fry tank and twin baskets. Provide extra set of twin baskets.
3. S/S cabinet
4. Four (4) casters two (2) with brakes.
5. Fry pot cover.
6. Cord and plug assembly.
7. Fryer located in restaurant portion to have Frymaster built in filter system.
8. Provide one (1) Frymaster portable oil filter for lab fryers.
9. Provide one (1) Frymaster portable shortening disposal unit.
10. Provide quantities and sizes required: Dormont Model #VER-KITCF-2S-48 Gas connection kit, 48" long, double Super-Swivel coupling with Safety Quick safety fitting w/coiled restraining device, full port gas valve, antimicrobial coating, lifetime warranty.

**ITEM NO. 948                      DISHMACHINE - FUTURE**

**QUANTITY 1**

**Manufacturer:** Hobart  
**Model:** CL44eN-BAS  
**Size and Shape:** Refer to drawings  
**Alternate:** Champion

1. Dishwasher, conveyor type, single tank design, 202 racks/hour capacity, S/S construction, with automatic fill, auto timer, and 115 volt pilot circuit.
2. 15 KW Electric tank heat.
3. 480/60/3.
4. Verify direction of dishmachine with drawings.
5. One (1) Extended warranty - One (1) Year parts and labor.
6. Chamber height to be 4" taller than standard.
7. Single point electrical connection for Motors, Controls and Tank Heat. Div. 26 to provide S/S disconnect switches located as per plans interconnected to dishmachine and external booster heater.
8. Two (2) vent cowls with 4 x 16 vent and damper. Provide 18 gauge stainless steel seamless duct risers 6" above finish ceiling for final connection. The duct: trimmed at ceiling with 16 gauge stainless steel flange with all corners welded.
9. One (1) table limit switch with stainless steel cover to conceal back. Provided by Manufacturer / Installed by Div. 26.

10. Four (4) 20"x20" Peg racks.
11. Four (4) 20" x 20" sheet pan racks.
12. Two (2) 20" x 20" combination racks.
13. Vent fan controls.
14. Drain water tempering kit. Drain water tempering kit is to be installed by Hobart Service.
15. Peak Rate of drain flow = 38 gpm. Division 22 to provide and install backflow preventor between booster heater and filter. Final connection by Division 22. Coordinate location of electrical disconnects on free wall.

**ITEM NO. 949**

**THREE COMPARTMENT SINK - FUTURE**

**QUANTITY 1**

**Manufacturer:** Custom Fabricated  
**Model:** ---  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Top: 14-gauge S/S 3" high 1-1/2" rolled rim at free sides, 10" high splash at walls.
2. Open base construction.
3. Omit rear rail at sink.
4. Three (3) 30" x 26" x 15" deep sink compartment.
5. Two (2) T&S model no. B-0291, splash mount faucet, 18" swing nozzle, LL inlets, for 3/4" hot and cold water connections.
6. Three (3) Fisher 22306 twist waste valve 3 1/2" x 2" with overflow and tailpiece. Provide 18 gauge S/S bracket for drain handle welded to sink bottom.
7. 12" deep single post mounted perforated overshef mounted at 18" above counter top.
8. 18-gaugebutt joint wall panel from splash to underside of shelf.
9. Post mounted utensil rack, extend 1-5/8" diameter S/S post from back splash, turn forward 12" and weld full length x 2" x 1/4" S/S bar with Component Hardware model no. V-77-4401 S/S sliding hooks at 8" on center.
10. One (1) Chicago model no. 305-VBRCF hose bibb and rack mounted on 12 gauge S/S bracket ground and polished to match top. Hose and spray rinse by owner.
11. Omit front rail at hose bibb.
12. 16-gauge S/S undershef as per drawings.
13. Flanged feet at front only of counter.
14. Anchor flanged feet to floor with non-corrosive bolts. Secure wall mounted equipment / components to in wall grounds or anchor plates. Coordinate installation with the general contractor.

**ITEM NO. 950**

**FOUR BURNER RANGE - FUTURE**

**QUANTITY 2**

**Manufacturer:** Vulcan  
**Model:** V4B36- B, S OR C  
**Size and Shape:** Refer to drawings



**Alternate:** Garland, Montague, Southbend

1. Standard base oven
2. *Convection oven base.*
3. 3/4" rear gas connection. Stainless steel cap and plat at front manifold.
4. 3/4" gas regulator.
5. 10" high stainless steel backguard.
6. Heavy duty casters with brakes.
7. Electronic ignition.
8. Cord and plug assembly, coordinate NEMA configuration with electrician.
9. Provide quantities and sizes required: T&S Model #HG-4VERIFY-48SK Antimicrobial Coated Hose w/NPT Male Ends, Swivel Links, 2-Piece Quick Disconnect, 90° Elbow & Installation Kit w/coiled restraining device, full port gas valve, lifetime warranty.

**ITEM NO. 951 FIRE PROTECTION SYSTEM - FUTURE**

**QUANTITY 2**

**Manufacturer:** Ansul  
**Model:** R102  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Duct and plenum protection to exhaust hood.
2. Surface protection for cooking equipment.
3. Locate remote fire pulls as recommended by Fire Marshal.
4. One (1) lot Mechanical gas valve (maximum diameter as required). Size as required. Furnished by Section 114000, installed by Division 22. Kitchen Equipment Contractor to coordinate location with local Fire Marshal requirements prior to submittal review. All conduits to be recessed within wall, SURFACE MOUNTING WILL NOT BE ACCEPTED.
5. System to meet U.L. 300 requirements.
6. Provide one (1) hand held Type 'K' and ABC 6 liter fire extinguisher per Ansul System, surface wall mounted.
7. Exposed pipe threads are unacceptable.
8. All exposed piping to be chrome plated.
9. All hood penetrations to have U.L. listed "Quick Seal". Provide s/s escutcheons at all hood penetrations.
10. Provide phenolic I.D. labels for exhaust hood, remote fire pull, light/fan switches and fire protection system.
11. Provide a manufacturer performance test and report that verifies this system is fully operational.
12. Provide s/s cabinet as shown on plan.
13. Installer to provide one (1) Ansul system per exhaust hood, review drawings and provide systems as required.
14. Install hand held extinguishers, maximum of 3'-2" A.F.F. to top of unit.

**ITEM NO. 952 EXHAUST HOOD - FUTURE**

**QUANTITY 1**

**Manufacturer:** By Mechanical  
**Model:** ---  
**Size and Shape:** ---  
**Alternate:** ---

**ITEM NO. 953 EXHAUST HOOD - FUTURE**

**QUANTITY 1**

**Manufacturer:** By Mechanical  
**Model:** ---  
**Size and Shape:** ---  
**Alternate:** ---

**ITEM NO. 954 SOILED & CLEAN DISHTABLE - FUTURE**

**QUANTITY 2**

**Manufacturer:** Custom Fabricated  
**Model:** ---  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Top: 14 gauge type 304 S/S 3" high 1-1/2" rolled rim at free sides. 10" high splash at walls.
2. 14 gauge S/S recessed deposit shelf. Extend shelf through opening to be flush with wall at deposit side. Turn shelf down 2" at front with 3/4" return at bottom (either scribed into partition or forming reveal). Shelf: integral with dishtable. Provide Component Hardware E32-4900 drain - extend drain line to floor sink.
3. 18 gauge butt joint wall panel from splash to underside of shelf.
4. Modify rolled rim at the operators side of the tray drop window to have a 3" rolled rim.
5. Install Disposer as shown. Notch and punch splash turn back for vacuum breaker. 12 gauge S/S bracket mounted below counter top and polished to match top for disposer control panel.
6. Provide One (1) T&S model no. B-0133-EE pre-rinse, B-0108-C spray head, two (2) B-0109-04 18" long wall bracket (dealer to cut to correct length), one (1) additional spray face model no. 108SFRK with ceramic cartridges.
7. One (1) Chicago model no. 305-VBRCF hose bibb and rack mounted on 12 gauge S/S bracket ground and polished to match top. Hose and spray rinse by owner.
8. One (1) 18" disposer cone.
9. Removable S/S rack guide assembly when sink is shown.
10. Provide 1/2" slope in top towards dishmachine per the general specifications.
11. When shown, one (1) Cookson Model #ESC10 S/S roll down door at the deposit shelf. The door hood is to be mounted to the face of the wall on the operator's side. Push-up operation.
12. Fully welded s/s window frame and s/s trim on face sides and top (both sides), coordinate with roll down door.
13. S/S corner filler at backsplash; slope to dishtable.
14. S/S cover to conceal table limit switch.

15. 2 1/2" backsplash at dishmachine portion, single thickness of s/s will not be accepted.
16. Anchor flanged feet to floor with non-corrosive bolts. Secure wall mounted equipment / components to in wall grounds or anchor plates. Coordinate installation with the general contractor.
17. Radius Turning Bar located per drawings. 1/4" x 2" flat S/S bar welded to 1/2" diameter post fully welded to the countertop. 36" radius at turning bar. Fabrication to allow for continuous discharge of racks to the table limit switch. KEC to coordinate requirements with fabrication.

**ITEM NO. 955                      MOBILE UTENSIL SHELF - QTY. 2 FUTURE**

**QUANTITY 6**

**Manufacturer:** Cambro  
**Model:** Camshelving Premium  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. Four (4) tier, includes two (2) drop-ins and (1) cutting board/tray drying rack, built in Microban antimicrobial product protection.
2. Four (4) 75" high posts.
3. Two (2) no. 5MPX casters per unit.
4. Two (2) no. 5MPBX locking casters per unit.
5. Two (2) bottom shelves equipped with sheet pan drying rack assemblies.

**ITEM NO. 956                      UTILITY SINK - FUTURE**

**QUANTITY 2**

**Manufacturer:** Advance Tabco  
**Model:** 400  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

**ITEM NO. 960                      HAND SINK - QTY. 4 FUTURE**

**QUANTITY 7**

**Manufacturer:** Advance Tabco  
**Model:** 7-PS-50  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

1. 20 gauge stainless steel construction.
2. Basket drain and wall bracket.
3. Gooseneck faucet with wrist handles.
4. Soap and towel dispensers by Owner.
5. P-Trap assembly, delete open/close drain valve.
6. Custom fabricated removable end splashes on sides as required by code. height same as rear splash.
7. Trade contractor to provide temperature adjustment valves as required.

**ITEM NO. 961                      CONVECTION OVEN - FUTURE**

**QUANTITY 2**

**Manufacturer:**                      Blodgett  
**Model:**                                DFG-100ES DBL  
**Size and Shape:**                  Refer to drawings  
**Alternate:**                            ---

1. S/S front, top and sides.
2. Two (2) 1/2 HP 2-speed motors.
3. Natural gas.
4. SSI-M solid state infinite control with manual timer.
5. Electronic spark ignition.
6. Five (5) oven racks per compartment.
7. Dual pane thermal windows.
8. Simultaneous door operation.
9. Heavy duty casters, two (2) with brakes.
10. Provide quantities and sizes required: T&S Model #HG-4VERIFY-48SK Antimicrobial Coated Hose w/NPT Male Ends, Swivel Links, 2-Piece Quick Disconnect, 90° Elbow & Installation Kit w/coiled restraining device, full port gas valve, lifetime warranty.
11. Dedicated gas connections, do not manifold.
12. Shunt trip breaker by Division 26.

**ITEM NO. 967                      MOBILE WORKTABLE**

**QUANTITY 24**

**Manufacturer:**                      Custom Fabricated  
**Model:**                                ---  
**Size and Shape:**                  Refer to drawings  
**Alternate:**                            ---

1. Top: 14 gauge type 304 S/S with 2" turndown at all sides.
2. Open base construction.
3. 16 gauge S/S undershelf per drawings.
4. Two (2) 20" W x 20" L drawer assemblies. Component Hardware #S52-2020 drawer slides with delrin bearings - 200lb capacity. Component Hardware #S80-2020 drawer pan.
5. 5" N.S.F. approved non-marking swivel casters, two with brakes.
6. At one (1) table only, table height to match takeoff shelf. (For Single deck, table height to match takeoff shelf. For Double, table height to match lowest take off shelf. For Triple, table height to match center take off shelf.)
7. Recessed top per drawings to accommodate cutting board. Cutting board to be flush with rest of counter. Provide stainless steel pegs in recessed top to hold cutting board in place. Cutting board to be ½" thick Richlite.

- One (1) table located at Pizza Oven #172, is to match lowest (or intermediate, if 3- tier) pizza conveyor belt height. Table to have 1" recess in top with pegs for 24" x 24" x 1" Richlite Cutting Board. Cutting Board by 11 40 00.

**ITEM NO. 984                      MICROWAVE - FUTURE**

**QUANTITY 2**

**Manufacturer:** Panasonic  
**Model:** NE-17523  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

- Special Instruction:** Coordinate cord and cap with receptacle.

**ITEM NO. 992                      REACH-IN REFRIGERATOR - 1DR**

**QUANTITY 2**

**Manufacturer:** Traulsen  
**Model:** AHT-132WUT  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

- Anodized aluminum interior and S/S exterior.
- Interior lights with bulbs.
- Exterior digital thermometer.
- Locking hardware.
- Universal 18" x 26" and 12" x 20" pan files on 4" centers in all sections.
- 6" high adjustable S/S legs.
- Furnish start-up and three (3) years repair service, including parts and labor.
- Five (5) Year compressor warranty.
- Omit plug. Unit to be Hard Wired.
- Full height glass doors hinged as per plan.
- Re-hinging feature.
- Coordinate connection to back-up generator per TISD standards.

**ITEM NO. 993                      REACH-IN FREEZER - 3DR**

**QUANTITY 2**

**Manufacturer:** Traulsen  
**Model:** RLT-332WUT  
**Size and Shape:** Refer to drawings  
**Alternate:** ---

- S/S interior and exterior.
- Interior lights with bulbs.
- Exterior digital thermometer.
- Locking hardware.

5. Universal 18" x 26" and 12" x 20" pan files on 4" centers in all sections.
6. S/S legs.
7. Furnish start-up and three (3) years repair service, including parts and labor.
8. Five (5) Year compressor warranty.
9. Provide cord and plug.
10. Full height stainless steel doors hinged as per plan.
11. Re-hinging feature.
12. **Traulsen to provide temperature monitoring / alert feature. Connect to building wifi or ethernet.**
13. Coordinate connection to back-up generator per TISD standards.

**END OF TOMBALL HS 3**

**SECTION 11 5300  
LABORATORY EQUIPMENT**

**PART 1 – GENERAL**

**1.01 WORK DESCRIPTION**

- A. This section of the specification pertains to wood laboratory casework and related equipment.
- B. Related work.
  - 1. Documents affecting work of this section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and sections in Division 01 of these Specifications.

**1.02 WORK INCLUDED**

- A. Laboratory casework and equipment, covered by this specification and accompanying drawings, are manufactured or supplied by one manufacturer to avoid divided responsibility.
- B. Laboratory equipment contractor will:
  - 1. Furnish equipment as listed in specifications, equipment schedule and drawings. This includes delivery to the building, setting in place, leveling and scribing to walls and floors.
  - 2. Furnish plumbing and electrical fixtures as specified, including nipples and lock nuts needed to secure each fixture to the equipment. Fixtures are furnished unassembled and loose in cartons for installation by other trades.
  - 3. Furnish sinks and sink outlets.
  - 4. Remove debris, dirt and rubbish accumulated as a result of this installation; leaving premises clean and orderly.
  - 5. Furnish and cover installed casework with 4 mil. polyethylene film to protect from soiling until other trades have completed their work.

**1.03 RELATED WORK NOT INCLUDED**

- A. Division 01 - General:
  - 1. Furnish materials generally classified as maintenance or supply items.
  - 2. Provide hoisting or elevator service at no charge.
  - 3. Furnish security and protection during and after laboratory equipment installation.
- B. Division 06 – Wood and Plastics: Furnish and install necessary framing, or reinforcement, of walls, floors or ceiling, to support equipment.
- C. Division 09 – Finishes: Furnish and install 4 inch high, cove base.
- D. Division 21, 22, 23 – Mechanical:
  - 1. Furnish, install and connect drain lines, service piping, vents, re-vents, in-line vacuum breakers, special plumbing fixtures, traps and tailpieces. Work to be completed through, under or along backs of working surfaces as required. Complete final connection of services.
  - 2. Assemble, install and make final connections of service fixtures furnished by casework contractor, including service fixtures in fume hoods.
  - 3. Furnish, install and connect fume hood blowers, motors and all related duct work.
  - 4. Furnish, install and connect service piping within fume hoods, including final connection of services.
- E. Division 26 – Electrical:
  - 1. Furnish, install and connect electrical service lines, wire and conduit within the equipment, including reagent racks and fume hoods. Work to be completed through, under or along backs of working surfaces as required. Complete final connection of services.
  - 2. Install and make final connections of electrical fixtures provided by casework contractor, including electrical fixtures in fume hoods.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

- B. Product Data: Provide equipment dimensions and construction, equipment capacities, physical dimensions, utility and service requirements and locations.
- C. Shop Drawings: Indicate equipment locations, large scale plans, elevations, cross sections, rough-in and anchor placement dimensions and tolerances, clearances required.
- D. Samples and certifications are to be submitted in order that the casework contractor demonstrates his ability to provide casework and furnishings, according to the Architect's specifications. Samples and certification literature will be received by the Architect no later than ten days prior to bid opening date. All questions will be answered in detail to remove confusion or doubt over what is being provided. Failure to meet submittal requirements is sufficient reason to reject the bid.
- E. Samples: Supplier is permitted only one submittal of samples. Approved sample units may be held until completion of work. Samples will be removed when Architect requests. Submit, as required by the architect:
  - 1. Base cabinet with drawer and cupboard with full-depth, adjustable shelf, hinged door and applicable hardware.
  - 2. Wall case with full-depth, adjustable shelf, hinged door and applicable hardware.
  - 3. Tall case with full-depth, adjustable shelf, hinged door and applicable hardware, including a 3-point latching system.
  - 4. One set of samples for countertop(s) specified.
  - 5. One set of casework finish samples.
- F. Test Reports - Certifications: Submit:
  - 1. Test reports certifying that the casework finish complies with chemical and other resistance requirements of the specifications.
  - 2. Performance test reports from an independent testing lab on each specified top material.
- G. Closeout Submittals:
  - 1. Submit under provisions of Section 01 7800 – Closeout Submittals.
  - 2. Submit Material Safety Data Sheets under provisions of Section 01 7800 – Closeout Submittals for the following items:
    - a. All mastics, glues, and adhesives
    - b. Fire doors (insulating material)
    - c. Sealant (interior use only)

#### **1.05 QUALITY ASSURANCE**

- A. The intent of this specification is to establish minimum standards for materials, hardware, finish, construction, design, function, and workmanship of wood laboratory casework, furniture and equipment; and, to exclude inadequate or inferior products.
- B. Qualified wood laboratory casework and equipment manufacturer's bids must comply with these specifications. A bid proposing a change, modification, or substitution must clearly state variances to the minimum standard. Alterations are subject to the Architect's approval; the decision to accept, or reject, is final and not subject to further debate.
- C. No later than ten days prior to bid opening, bidders must provide the following information as proof of their ability to perform. Failure to meet these requirements is sufficient reason to reject the bid. Provide:
  - 1. Proof of five years of experience in the manufacturing of wood casework and furnishings, as specified.
  - 2. Proof of five completed installations, equal in size and educational requirements, which are available for inspection prior to the awarding of the contract.
  - 3. Evidence of sufficient financial and technical resources to avoid delays in completion of the work, and to assure prompt and satisfactory production, delivery and installation of wood laboratory casework and equipment.
- D. Owner reserves the right of refusal, and can award the contract to other than the lowest bidder; if, in his opinion, it will ensure a higher level of performance, function, quality, or value.



- E. General Contractor will not award subcontract to a wood laboratory casework supplier who is not on the approved list, unless the Architect has approved that supplier's samples, certificates, individual product drawings, and proof of ability to perform.

#### **1.06 PROJECT CONDITIONS**

- A. For delivery and installation of laboratory casework and equipment, building conditions shall be as follows:
  - 1. Building is secure and weather tight, with windows and doors installed.
  - 2. Ceiling, overhead ductwork and lighting is installed.
  - 3. Painting is completed.
  - 4. Floor tile is installed.
  - 5. Heat and air conditioning systems are functional; providing temperature and humidity consistent with conditions to be maintained by Owner.

#### **1.07 DRAWINGS**

- A. The successful bidder will prepare and submit one sepia and two blue-line sets of shop drawings including floor plans, rough-ins, elevations, and other details necessary to fully illustrate and describe the casework and equipment being furnished. Shop drawings will be coordinated with other trades.

#### **1.08 WARRANTY**

- A. Manufacturer warrants the casework to be free from defects in materials and workmanship, under normal use and service, for one year from date of delivery. Within the warranty period, Manufacturer shall, at its option, repair, replace, or refund the purchase price of defective casework. Manufacturer shall be notified immediately of defective products, and be given a reasonable opportunity to inspect the goods prior to return.

### **PART 2 – PRODUCTS - SCIENCE LAB EQUIPMENT**

#### **2.01 ACCEPTABLE MANUFACTURERS**

- A. Campbell Rhea-ICI Institutional Casework Inc.: [www.iciscientific.com](http://www.iciscientific.com).
- B. Indeco Sales, Inc. / Maco Manufacturing.: [www.macomfg.com](http://www.macomfg.com)
- C. Leonard Peterson & Co.: [www.lpc.com](http://www.lpc.com).
- D. Sheldon Lab Systems: [www.sheldonlabs.com](http://www.sheldonlabs.com).
- E. Substitutions: See Section 01 6000 - Product Requirements.
- F. Manufacturers listed above are for manufacturer approval only. All products shall meet the requirements of the specified product.
- G. Basis of Design: Campbell Rhea Division of ICI Institutional Casework Inc.

#### **2.02 MATERIALS**

- A. Hardwood Lumber
  - 1. Species: As scheduled in Section 01 6210, grade FAS or better, air dried and kiln dried to a 6 percent moisture content, then tempered to 7-8 percent prior to fabrication. Lumber exposed to view, is to be free of stains, splits, shakes, season checks and other similar defects.
  - 2. Other hardwoods are grade FAS or better, air dried to 6-percent moisture content, then tempered to 7-8 percent prior to fabrication. Other hardwoods are used in semi-exposed, or unexposed, areas and comply with NHLA grading for FAS or better lumber.
- B. Veneer Faced Plywood
  - 1. Veneer Species: As scheduled in Section 01 6210, grade A-2, plain sliced, book-matched, crossbanded, and has a solid core. The 3/4 inch hardwood plywood is a minimum of 7-ply, 1/2 inch is a minimum of 5-ply, 1/4 inch is a minimum of 3-ply, and 3/32 inch is 3-ply.

2. Other hardwood plywoods are sound grade, have a solid core and are suitable for semi-exposed or unexposed areas. The 3/4 inch hardwood plywoods are a minimum of 7-ply, 1/2 inch are a minimum of 5-ply, 1/4 inch are a minimum of 3-ply, and 3/32 inch are 3-ply.
- C. Hardboard: Hardboard is service tempered and consists of steam-exploded wood fibers, highly compressed into a hard, dense, 1/4 inch thick, homogeneous sheet, using natural resins and other added binders. Physical properties: Average modulus of rupture is 5,300 lbs./sq. inch; density is 50 to 60 lbs./cu. foot; and tensile strength of 3,500 lbs./sq. inch.
- D. Particleboard: Particleboard is industrial grade, with the following physical properties: Density, 46 to 50 lbs./cu. ft.; modulus of rupture, minimum, 2,200 psi; modulus of elasticity, minimum, 450,000 psi.
- E. Glass
  1. DSB glass is double strength, grade "B", and 1/8 inch thick.
  2. Float glass is poured, clear glass, 1/4 inch thick, with a minimum of 88 percent clarity.
  3. Laminated safety glass consists of two outer plies of glass with a vinyl interlayer, and is either 7/32 inch or 1/4 inch thick.
  4. Tempered safety glass is specially heat treated glass, 1/4 inch thick with a minimum of 88 percent clarity.

## 2.03 CONSTRUCTION

- A. Drawers:
  1. Components:
    - a. Drawer front: 3/4" veneered plywood with 1/8" hardwood edge.
    - b. Drawer sides and back: 1/2 inch hardwood lumber.
    - c. Drawer bottom: 1/4 inch service tempered hardboard.
  2. Construction: All four corners of the drawer are dovetailed and glued. Edges of the drawer front are radiused and overlap the opening on all sides. Drawer fronts are one piece of lumber, whenever possible, providing consistency in color and vertical grain within each drawer front. The back perimeter of the drawer front is routed so the drawer front is recessed into the opening and projects 13/32 of an inch. The top edge of drawer sides and back are radiused. Drawer bottom is let in on four sides, and securely glued underneath with a continuous bead of glue around the perimeter of the drawer bottom. In cabinets 24 inches or less in width, drawers have one, AL-1 aluminum pull, surface mounted with two screws, four inches on centers. In cabinets over 24 inches wide, drawers have two, AL-1 aluminum pulls. Drawers are supported on DS-1 slides which are side mounted, heavy duty, zinc plated, cold rolled steel, and have a 75 lb. load capacity. Slides are equipped with heavy-duty, ball bearing nylon rollers for smooth effortless operation. DS-1 slides have automatic, positive stop levers to prevent drawer's accidental removal, but allow for quick removal without tools. File drawers are supported on side mounted FD-1, full extension steel slides. File drawers have an interior, screw mounted, metal bottom track and an adjustable metal file follower. Lock SL-1 is furnished when indicated.
- B. Doors, Hinged:
  1. Hinged solid doors, 48 inches or less in height:
    - a. Components:
      - 1) Core ply: Solid hardwood rails on four edges framing a particleboard core.
      - 2) Hardwood plywood crossbands: Four; 2 laminated on each side of core ply.
      - 3) Hardwood veneer: Face plys; one applied to each side.

- b. Construction: Hinged solid doors, 48 inches or less in height, are 13/16 inch thick, machine radiused on the edges and overlap opening on all sides. The back perimeter of the door is routed so the door is recessed into the opening and projects 13/32 inch. The left door of double doors has a center machined astragal. Doors have one, AL-1 aluminum pull, surface mounted with two screws, four inches on centers. Door has two SS-1 stainless steel, heavy duty, institutional type, 5-knuckle hospital tipped hinges; each attached with three tempered steel screws into solid oak framing of the door, and three Euro screws into the end panel. Doors are secured by a zinc plated steel, friction roller catch, with a positive action, spring cushioned, polyethylene roller, and a metal strike plate. Catch and strike plate are mounted with screws. The left door of double doors is secured with a steel, spring loaded, elbow catch that releases with finger pressure. The catch and steel strike plate are mounted with screws. Strikeplate screw holes are slotted for adjustability and a pinhole is provided to help anchor plate's position. Lock SL-1 is furnished when indicated.
- 2. Hinged solid doors over 48 inches in height:
  - a. Components:
    - 1) Core ply: Solid hardwood rails on four edges framing a honeycomb core.
    - 2) Hardwood plywood crossbands: Four; 2 laminated on each side of core ply.
    - 3) Hardwood veneer: Face plys; one applied to each side.
  - b. Construction: Hinged solid doors over 48 inches in height, are 1-1/16 inch thick, machine radiused on the edges to form a lip and overlap opening 1/4 inch on all sides. The back perimeter of the door is routed so the door is recessed into the opening and projects 13/32 of an inch. Single doors and right door of double doors have a LH-1 latching handle, which is 4-1/4 inches long, streamline design, with a dull chrome plated finish. Handle operates with 1/4 turn. Left door of double doors has a dummy handle, which is the same size and finish as a LH-1 latching handle. A three point latching system provides single doors and right door of double doors positive engagement at the top and bottom of the door with tapered aluminum rods which engage plastic strike plates and pull the door snug. The rods are 5/16 inch in diameter and move in nylon guides attached to the back of the door. The middle of the door is secured by a latch plate which engages the side of the case, or latches behind the left door on cases with double doors. Right door of double doors lap over the machined astragal on left door, securely holding door shut. Doors have three, SS-1 stainless steel, heavy duty, institutional type, 5-knuckle hospital tipped hinges; each attached with three tempered steel screws into solid hardwood framing of the door, and three Euro screws into the end panel. On double doors, left door is additionally secured with two positive action, zinc plated, friction roller catches, which have a spring cushioned, polyethylene roller, and a metal strike plate. Catch and strike plate are mounted with screws. Locking handle LK-1 is furnished when indicated.
- 3. Hinged glazed doors, 48 inches or less in height:
  - a. Components:
    - 1) Frame: 1-1/16 inch by 3 inches, solid hardwood.
    - 2) Glass: 1/8 inch thick DSB glass.

- b. Construction: Hinged glazed doors, 48 inches or less in height, are machine radiused on the edges to form a lip and overlap opening 1/4 inch on all sides. The solid hardwood frame joints are mortised and tenoned, glued and screwed. The balance of the door is glass. The back perimeter of the door is routed so the door is recessed into the opening and projects 13/32 inch. The left door of double doors has a center machined astragal. Door has one, AL-1 aluminum pull, surface mounted with two screws, four inches on center. Doors have two, SS-1 stainless steel, heavy duty, institutional type, 5-knuckle hospital tipped hinges; each attached with three tempered steel screws into solid hardwood framing of the door, and three Euro screws into the end panel. Doors are secured by a zinc plated steel, friction roller catch, with a positive action, spring cushioned, polyethylene roller, and a metal strike plate. Catch and strike plate are mounted with screws. The left door of double doors is secured with a steel, spring loaded, elbow catch that releases with finger pressure. The catch and steel strike plate are mounted with screws. Strike plate screw holes are slotted for adjustability and a pin hole is provided to help anchor plate's position. Lock SL-1 is furnished when indicated.
  - 4. Hinged glazed doors, over 48 inches in height:
    - a. Components:
      - 1) Frame: 1-1/16 inch by 3 inches, solid hardwood.
      - 2) Center cross frame member: 1-1/16 inch by 3 inches, solid hardwood.
      - 3) Glass: 1/8 inch thick DSB glass.
    - b. Construction: Hinged glazed doors over 48 inches in height, are machine radiused on the edges to form a lip and overlap opening 1/4 inch on all sides. The solid hardwood center cross frame member and frame have joints that are mortised and tenoned, glued and screwed. The balance of the door is glass. The back perimeter of the door is routed so the door is recessed into the opening and projects 13/32 inch. Single doors and right door of double doors have a LH-1 latching handle, which is 4-1/4 inches long, streamline design, with a dull chrome plated finish. Handle operates with 1/4 turn. Left door of double doors has a dummy handle, which is the same size and finish as a LH-1 latching handle. A three point latching system provides single doors and right door of double doors positive engagement at the top and bottom of the door with tapered aluminum rods which engage plastic strike plates and pull the door snug. The rods are 5/16 inch in diameter and move in nylon guides attached to the back of the door. The middle of the door is secured by a latch plate which engages the side of the case, or latches behind the left door on cases with double doors. Right door of double doors lap over the machined astragal on left door, securely holding door shut. Doors have three, SS-1 stainless steel, heavy duty, institutional type, 5-knuckle hospital tipped hinges; each attached with 3 tempered steel screws into the solid hardwood frame of the door, and three Euro screws into end panel. The left door of double doors is additionally secured by two zinc plated steel, friction roller catches, with positive action, spring cushioned, polyethylene rollers, and metal strike plates. Catch and strike plate are screw mounted. Locking handle LK-1 is furnished when indicated.
- C. Doors, Sliding
  - 1. Sliding solid doors, 48 inches or less in height:
    - a. Components:
      - 1) Core ply: Solid hardwood rails on four edges framing particleboard core.
      - 2) Hardwood plywood crossbands: Four; 2 laminated on each side of core ply.
      - 3) Hardwood veneers: Face plys; one applied to each side.

- b. Construction: Sliding solid doors, 48 inches or less in height, are 13/16 inch thick, and have square edges. Doors operate in sliding door track assembly DT-1, an overhead aluminum track and adjustable nylon roller hangers. Doors are secured at the bottom of the cabinet with two plastic guides per door that operate in recessed, aluminum channels. Each door has two, RS-1 pulls; nickel plated metal, recessed, finger grips. Pulls are located on each side of the door face, allowing for right or left movement of the door. Lock SD-1 is furnished when indicated.
- 2. Sliding solid doors over 48 inches in height:
  - a. Components:
    - 1) Core ply: Solid hardwood rails on four edges framing a honeycomb core.
    - 2) Hardwood plywood crossbands: Four; 2 laminated on each side of core ply.
    - 3) Hardwood veneers: Face plys; one applied to each side.
  - b. Construction: Sliding solid doors over 48 inches in height, are 1-1/16 inch thick, and have square edges. Doors operate in sliding door track assembly DT-1, an overhead aluminum track and adjustable nylon roller hangers. Doors are secured at the bottom of the cabinet with two plastic guides per door that operate in recessed, aluminum channels. Each door has two, RS-1 pulls; nickel plated metal, recessed, finger grips.
    - 1) Pulls are located on each side of the door face, allowing for right or left movement of the door. Lock SD-1 is furnished when indicated.
- 3. Sliding glazed doors, 48 inches or less in height:
  - a. Components:
    - 1) Frame: 1-1/16 inch by 3 inches, solid hardwood.
    - 2) Glass: 1/8 inch thick DSB glass.
  - b. Construction: Sliding glazed doors, 48 inches or less in height, have solid hardwood frames with joints mortised and tenoned, glued and screwed. The balance of the door is glass. Doors operate in sliding door track assembly DT-1, an overhead aluminum track and adjustable nylon roller hangers. Doors are secured at the bottom of the cabinet with two plastic guides per door that operate in recessed aluminum channels. Each door has two, RS-1 pulls; recessed, nickel plated metal, finger grips. Pulls are located on each side of the door face, allowing for right or left movement of the door. Lock SD-1 is furnished when indicated.
- 4. Sliding glazed doors, over 48 inches:
  - a. Components:
    - 1) Frame: 1-1/16 inch by 3 inches, solid hardwood.
    - 2) Center cross frame member: 1-1/16 inch by 3 inches, solid hardwood.
    - 3) Glass: 1/8 inch thick DSB glass.
  - b. Construction: Sliding glazed doors over 48 inches high have solid hardwood frames with joints mortised and tenoned, glued and screwed. Doors over 48 inches in height, have a center cross frame member. The balance of the door is glass. Doors operate in sliding door track assembly DT-1, an overhead aluminum track and adjustable nylon roller hangers. Doors are secured at the bottom of the cabinet with two plastic guides per door that operate in recessed aluminum channels. Each door has two, RS-1 pulls; recessed, nickel plated metal, finger grips. Pulls are located on each side of the door face, allowing for right or left movement of the door. Lock SD-1 is furnished when indicated.
- 5. Sliding glass doors:
  - a. Component:
    - 1) Sliding glass doors are 1/4 inch thick float glass.
  - b. Construction:

- 1) Sliding glass doors have polished vertical edges and swiped horizontal edges. Doors operate in sliding door track assembly GT-1, which has an aluminum track at the bottom, and an aluminum channel mounted at the top of the cabinet. The glass rests in aluminum shoes with nylon rollers, which operate in the bottom track. The top swiped edge of the glass is fitted with plastic glide clips to assure smooth movement in the channel. Each door has two, RS-2 pulls; two-piece, screw together, round, recessed pulls with a bright chrome finish. Pulls are located on each side of the door face, allowing for right or left movement of the door. Lock GL-1 is furnished when indicated.
- D. Base Cabinets
1. Components:
    - a. Frame and rails:
      - 1) Horizontal front top frame member: 1 inch by 2-1/4 inch, solid hardwood.
      - 2) Horizontal rear top frame member: 1 inch by 1-3/4 inch, solid hardwood.
      - 3) Front intermediate rails: 3/4 inch by 2-1/4 inch, solid hardwood.
      - 4) All other frame members: 3/4 inch by 1-3/4 inch solid hardwood.
    - b. Backs:
      - 1) Exposed exterior backs: 3/4 inch hardwood plywood.
      - 2) Cabinets with exposed interiors but unexposed exteriors: backs are 1/4 inch hardwood plywood.
      - 3) Cabinets with unexposed interiors and exteriors: backs are 1/4 inch service tempered hardboard.
    - c. End panels:
      - 1) Cabinets with exposed interiors: end panels are 3/4 inch hardwood plywood.
      - 2) Cabinets with exposed exteriors: end panels are 3/4 inch hardwood plywood.
      - 3) Cabinets with unexposed interiors and one exposed end panel and one unexposed end panel: exposed end panel is 3/4 inch hardwood plywood, and unexposed end panel is 3/4 inch hardwood plywood.
      - 4) Cabinets with unexposed interiors and unexposed exteriors: end panels are 3/4 inch hardwood plywood.
    - d. Bottom, shelves, and dividers:
      - 1) Cabinets with exposed interiors: all are 3/4 inch hardwood plywood.
      - 2) Cabinets with unexposed interiors: all are 3/4 inch hardwood plywood.
    - e. Exposed edges of end panels, bottom, shelves, and dividers are edgebanded with 1/4 inch solid hardwood.
    - f. Drawer separators, if specified, or when locks are indicated, are 1/4 inch service tempered hardboard.
  2. Construction: All structural joints are mortised and tenoned, glued and screwed. Base cabinets are rigidly constructed, integral units. Each base cabinet is completely enclosed without the use of common partitions, and has flush construction with overlapping doors and drawers, which provides a dust resistant interior. A base cabinet has a full horizontal top frame with mortised and tenoned joints, intermediate front and rear horizontal parting rails, as required; 3/4 inch plywood bottom, and dividers, as required. Horizontal top frame, intermediate parting rails and the bottom are tenoned and let into routed end panels, then glued and fastened with countersunk screws. Backs are recessed and let into routed end panels, except where they need to be removable for access to plumbing. Backs are screwed to the top frame and bottom panel and further secured with glue blocks on each side. An enclosed toe space, 2-1/4 inches by 4 inches, is provided, with the toe rail screwed to end and bottom panel. Separators where indicated, are let into routed intermediate rails and end panels. Cabinets with sliding doors have 1/4 inch solid hardwood molding on the front interior, vertical edge of end panels, providing a dust strip for sliding doors. Adjustable shelves are supported on heavy-duty, plastic coated, brass plated steel shelf clips, which fit into holes drilled 32 mm on centers, in the cabinet end panels.

E. Wall and Upper Cases:

1. Components:
  - a. Front rails: top and bottom, 2-1/4 inches by 3/4 inch, solid hardwood.
  - b. Top panel, bottom panel, adjustable shelves:
    - 1) Cases with exposed interiors: all are 3/4 inch hardwood plywood.
    - 2) Cases with unexposed interiors: all are 3/4 inch hardwood plywood.
  - c. Backs:
    - 1) Cases with exposed interiors: back is 1/4 inch hardwood plywood.
    - 2) Cases with unexposed interiors: back is 1/4 inch service tempered hardboard.
  - d. End panels:
    - 1) Cases with exposed interiors: end panels are 3/4 inch hardwood plywood.
    - 2) Cases with exposed exteriors: end panels are 3/4 inch hardwood plywood.
    - 3) Cases with unexposed interiors and one exposed end panel and one unexposed end panel: exposed end panel is 3/4 inch hardwood plywood; the unexposed end panel is 3/4 inch hardwood plywood.
    - 4) Cases with unexposed interiors and unexposed exteriors: end panels are 3/4 inch hardwood plywood.
  - e. Exposed edges of end panels and shelves are edgebanded with 1/4 inch solid oak.
  - f. Exterior hanger rails: 3 inch by 3/4 inch hardwood plywood.
2. Construction: All structural joints are mortised and tenoned, glued and screwed. Wall and upper cases are rigidly constructed, integral units. Each case is completely enclosed without the use of common partitions, and has flush construction with overlapping doors, which provides a dust resistant interior. Top panel is tenoned and let into routed end panels; lapped, glued and screwed to front top rail; and glued and screwed to each end panel and the back. Bottom panel is tenoned and let into routed end panels; lapped, glued and screwed to front bottom rail; and glued and screwed to each end panel and the back. Backs are recessed and let into routed end panels, and further secured with glue blocks on each side. Exterior hanger rails, at the top of the back, are glued to the back and then screwed to the top panel and end panels. Exterior hanger rails, at the bottom of the back, are glued to the back and then screwed to the bottom panel and end panels. Cases with sliding doors have 1/4 inch solid hardwood molding on the front interior, vertical edge of end panels, providing a dust strip for sliding doors. Adjustable shelves are supported on heavy-duty, plastic coated, brass plated steel shelf clips, which fit into holes drilled 32 mm on centers, in the case end panels.

F. Tall Cases:

1. Components:
  - a. Top front rail: 2-1/4 inches by 3/4 inch, solid hardwood.
  - b. Top panel, bottom panel, dividers, fixed shelf and adjustable shelves:
    - 1) Cases with exposed interiors: all are 3/4 inch hardwood plywood
    - 2) Cases with unexposed interiors: all are 3/4 inch hardwood plywood.
  - c. Backs:
    - 1) Cases with exposed interiors and exposed exteriors: back is 1/4 inch hardwood plywood.
    - 2) Cases with unexposed interiors and unexposed exteriors: back is 1/4 inch service tempered hardboard.
  - d. End panels:
    - 1) Cases with exposed interiors: end panels are 3/4 inch hardwood plywood.
    - 2) Cases with exposed exteriors: end panels are 3/4 inch hardwood plywood.
    - 3) Cases with unexposed interiors and one exposed end panel and one unexposed end panel: exposed end panel is 3/4 inch hardwood plywood; unexposed end panel is 3/4 inch hardwood plywood.
    - 4) Cases with unexposed interiors and unexposed exteriors: end panels are 3/4 inch hardwood plywood.

- e. Exposed edges of end panels, dividers and shelves are edge banded with 1/4 inch solid hardwood.
  - f. Exterior back cross rails: 3 inches by 3/4 inch hardwood plywood.
  - 2. Construction: All structural joints are mortised and tenoned, glued and screwed. Tall cases are rigidly constructed, integral units. Each case is completely enclosed without the use of common partitions, and has flush construction with overlapping doors, which provides a dust resistant interior. Top and bottom panels and fixed center shelf are tenoned, and let into routed end panels. Top panel is lapped, glued and screwed to front top rail; top panel, fixed shelf and bottom panel are glued and screwed to each end panel and the back. An exterior back cross rail is provided at the top of each case, glued to the back and then screwed to the top panel and the end panels. Additional back cross rails are provided, as required. Backs are recessed, let into routed end panels, and further secured with glue blocks at the sides. A totally enclosed toe space, 2-1/4 inches by 4 inches high, is provided with toe rail securely screwed to end panels and bottom panel. Cases with sliding doors have 1/4 inch, solid hardwood molding running the full height of case opening, on the front interior edge of each end panel, providing a dust strip for the sliding doors. Adjustable shelves are supported on heavy-duty, plastic coated, brass plated steel shelf clips, which fit into holes drilled 32 mm on centers, in the case end panels.
- G. Open Frame Tables:
- 1. Components:
    - a. Exterior rails:
      - 1) Plain: 4-1/8 inches by 3/4 inch, solid hardwood.
      - 2) With drawers or compartments: 5-1/2 inches by 3/4 inch, solid hardwood.
    - b. Interior rails: 3/4 inch solid hardwood; 3/4 inch solid hardwood, if visible.
    - c. Compartment bottoms: 1/4 inch hardwood plywood.
    - d. Legs: 2-1/2 inch square laminated solid hardwood.
    - e. Leg stretcher, when indicated: 2 inch square laminated solid hardwood.
  - 2. Construction: Exterior table rails are one piece (no edge gluing) solid hardwood. Openings are routed in the one piece rail when drawers or compartments are required. A minimum of two interior cross rails are mortised and tenoned, glued and stapled into exterior rails. Compartment bottoms are let into grooves in cross rails and the front rail, then glued and stapled to the compartment back. Exterior rails are grooved at corners to receive heavy steel corner braces, attached with screws. Legs are secured to the steel corner brace and table rails with a 5/16 inch threaded hanger bolt, machine screwed into the leg a depth of at least 2 inches. Legs have molded black polyethylene, closed bottom, leg shoes. Exterior rails are also grooved to accept "Z" clips for attaching the top.
- H. Pedestal Tables:
- 1. Components:
    - a. Center rail: 4-1/2 inches by 1-1/16 inch, solid hardwood.
    - b. End rails: 4-1/2 inches by 1-1/16 inch, solid hardwood.
    - c. Pedestal legs: 1-3/16 inch particleboard overlaid on both sides with 3/32 inch hardwood plywood. Vertical edges are edgebanded with 1/4 inch solid hardwood.
    - d. Feet: 2-1/4 inch thick and 2-1/4" high overall, laminated solid hardwood.
    - e. Leg stretcher: 3 inches high by 1-1/16 inch thick, solid hardwood.
  - 2. Construction: Pedestal tables have a rigid understructure with a center rail running the length of the table, two end rails across the width, two pedestal legs with feet, and one leg stretcher. Center and end rails are notched to interlock and then fasten to the top and pedestal legs. Feet are routed to receive pedestals. Each pedestal is glued, and fastened to the foot by two, 3 inch by 1/4 inch lag bolts. Each foot has two, 1-1/2 inch plastic floor glides. Leg stretcher is secured by four, 3 inch by 1/4 inch, lag bolts through the pedestal legs. Plastic "Z" glides for tote trays are attached to the underside of the table top. Tote trays are not included, and must be ordered separately.



## 2.04 HARDWARE AND ACCESSORIES

### A. Pulls

1. Pull AL-1 is a satin lacquer finished, extruded aluminum bar in a trim, modern design. Pull is mounted with two screws, 4 inches on center and projects from the surface one inch.
2. Pull RS - 1 is a recessed, metal finger grip. Pull is nickel plated and measures 2-7/8 inches by 13/16 inch.
3. Pull RS - 2 is a recessed, metal finger pull. Pull is 1-1/16 inch diameter, two piece, screw together style and has a bright chrome finish.

### B. Handles

1. Latching handle LH-1 is die cast zinc alloy, 4-1/4 inches long, streamline in design, and has a dull chrome plated finish. Handle operates with 1/4 turn. Double door cases have latching handles on the right door and dummy handles on the left door. A three point latching system provides a positive engagement at the top and bottom of the door with tapered aluminum rods which pull the door snug when they engage plastic strike plates. The rods are 5/16 inch in diameter and move in nylon guides attached to the back of the door. The middle of the door is secured by a latch plate which engages the side of the case, or latches behind the left door on cases with double doors.
2. Locking handle LK-1, furnished where indicated, is a latching handle with a lock mechanism incorporated into the handle head. On double door cases, the left door has a dummy handle, and the right door has the locking handle. Lock is laboratory grade with a 5-disc tumbler mechanism and a dull chrome plated face. Tumblers and keys are brass, while the plug and cylinder are die cast zinc alloy. Each room shall be keyed alike within the room and separately from other rooms. Locks and corresponding keys are alpha-numerically coded for a quick match.

### C. Locks

1. Lock SL-1 is laboratory grade, cylinder cam lock, with a 5-disc tumbler mechanism, and a dull chrome plated face. Tumblers and keys are brass, while plug and cylinder are die cast zinc alloy. Each room shall be keyed alike within the room and separately from other rooms. Locks and corresponding keys are alpha-numerically coded for a quick match.
2. All locks shall be keyed to a master key.

- D. Hinges: Hinge SS-1 is heavy duty, institutional type, 5-knuckle hospital tipped, and is made from .083 inch thick stainless steel. Hinge is semi-concealed, 2-1/2 inches high and has off-set wings. Each wing has 3 screw holes, one of which is slotted for adjustability.

### E. Catches

1. Friction roller catch is a zinc plated steel catch with a positive action, spring cushioned, polyethylene roller, and a metal strike plate. Screw mounted catch and strike plate have slotted holes for adjustability.
2. Elbow catch is a steel, spring loaded catch that releases with finger pressure. The catch and steel strike plate are mounted with screws. Strike plate screw holes are slotted for adjustability and pin hole is provided to help anchor its position.

### F. Drawer Slides

1. Drawer slides DS-1 are zinc plated, cold rolled steel, heavy-duty, side mounted, and have a 75 lb. load capacity. They are equipped with heavy-duty, ball bearing nylon rollers for smooth effortless operation. Slides have automatic positive stop levers to prevent drawer's accidental removal, but allow for quick removal without tools.
2. File drawer slides FD-1 are zinc plated, cold rolled steel, heavy-duty, side mounted, and have a 100 lb. load capacity. They are equipped with heavy-duty, ball bearing nylon rollers for smooth effortless operation. Slides are full extension with a positive stop, and a lift out disconnect.

### G. Sliding Door Track Assemblies

1. Sliding door track assembly DT-1 has an overhead aluminum track and adjustable, nylon roller hangers. The lipped edge of the upper aluminum track prevents rollers from jumping track. Two hard plastic guides are mounted on the bottom interior of the door, and operate in recessed aluminum channels.
  2. Sliding glass door track assembly GT-1 has an aluminum bottom track, and an aluminum channel mounted at the top of the cabinet. The glass rests in aluminum shoes with nylon rollers, which operate in the bottom track. The top swiped edge of the glass is fitted with plastic glide clips to assure smooth movement in the channel.
- H. Shelf Clips: Shelf clips are made from steel, then brass plated after fabrication. Clips are angle type with a 1/4 inch diameter, 3/8 inch long stud which fits into holes drilled 32 mm on centers. The 3/4 inch long ledge is dipped in a non-slip plastic coating, and has a pre-drilled hole to anchor shelf to the clip, if desired.
- I. Leg Shoes: Leg shoes are closed-bottom style, 2-1/2 inches square, and molded of 1/8 inch black polyethylene.
- J. Crossbars and Greenlaw Arms: Crossbars and Greenlaw Arms are 3/4 inch diameter, anodized aluminum rods, with ends rounded.
- K. Upright Rods: Upright Rods are 3/4 inch diameter, anodized aluminum, 36 inches long with a rounded top and a tapered bottom to fit rod sockets.
- L. Clamps: Clamps are 1 inch square aluminum stock, with two, 3/4 inch diameter openings, at right angles to each other, bored through sides. Openings are for upright rods and crossbars, or Greenlaw Arms. Thumb screws into each end of the clamp, tighten against the rods to hold positions.
- M. Burette Rods: Burette rods are 1/2 inch diameter, anodized aluminum, and either 18 or 24 inches long. Rods are furnished with a tapered aluminum adapter to fit rod socket.
- N. Rod Sockets: Rod sockets are mushroom type, machined from a solid aluminum rod. Sockets are held in place by a heavy aluminum lock nut and washer.

## **2.05 MECHANICAL SERVICE FIXTURES**

- A. Service Fixtures
1. Fixtures for water, gas, steam, or other services, are triple chrome plated, have heavy-duty construction and are specifically designed for laboratory use.
  2. Water Faucets - Hot and Cold: Faucets are cast from red brass, and have four-arm type handles with color coded indexes. Faucets have serrated hose tips, unless specified otherwise. Faucets have patented REX unit ceramic disc cartridges, and replaceable seats. The stem is brass, with full Acme threads, and has a brass cap nut. Goosenecks are rigid. Fixture outlets are tapped 3/8 inch I.P.S. for aerators, vacuum breakers, hose connections, or other accessories. Faucets with an integral vacuum breaker are required at each sink.
  3. Gas, Air and Vacuum Cocks: Ground key cocks, made from high grade, brass foregoing, have integral ten serration, non-slip hose tips. Wing handle has color-coded index button, is one piece construction, precision ground, and lapped to fit cock chamber. Handle operates with a 1/4 turn, and is spring-loaded for constant pressure and automatic take up. Do not use for oxygen service. When specified, needle point valves are available for high pressures and oxygen service.
  4. Multiple Service Fixtures: Triple chrome plated fixtures have one cold water faucet and two ground key cocks for gas, air, or vacuum services. Cold water valve has patented REX unit ceramic disc cartridge. Faucet has a rigid gooseneck, one four-arm handle, and serrated hose tip. Vacuum breaker furnished when specified. Faucet with integral vacuum beaker is furnished when specified. Ground key cocks have serrated non-slip hose tip, spring-loaded wing handles and color coded index buttons.

5. Vacuum Breakers: Watts NLF-9, or comparable, vacuum breakers are brass with polished chrome plating, screw-in type with stainless steel working parts, and durable rubber diaphragm and disc. Vacuum breaker is for hot or cold faucet and has a primary valve with a soft disc that seats against mating part. The secondary check valve utilizes a soft disc to metal seating. Vacuum breaker is tapped 3/8 inch N.P.T. Vacuum breaker is not intended for constant high pressures.
- B. Electrical Fixtures
  1. Receptacles are 3-wire grounded, 20 A, 125V AC, with stainless steel cover plates and cadmium-plated steel boxes. Pedestal boxes are brushed, cast aluminum with conduit nipples and lock nuts. All fixtures shall be G.F.I. Type. G.F.I. fixtures are 20 A, 125V AC, with a brown nylon face and a LED indicator light. G.F.I. fixtures conform to UL Standard 943 Class A, have hospital grade high abuse receptacle construction, and certified corrosion resistance with cupro-nickel exposed metal parts. G.F.I. fixtures have terminal screw wiring connections and a trip time of 0.025 seconds.
- C. Sinks and Sink Outlets
  1. Epoxy resin sinks are non-glaring black, specially modified epoxy resins, molded in one solid piece for optimum physical and chemical resistance. Inside corners are coved and the bottom is dish to the outlet. Outlets are epoxy resin, specially compounded and cured for optimum physical and chemical resistance, and 1-1/2 inches in diameter, unless otherwise specified.
  2. Stainless steel sinks have a satin finish. They are 18 gauge, type 304, 18-8 stainless steel, with heavily undercoated bottoms and positive pitch drains. Outlets are chrome-plated brass. Drain holes are 3-1/2 inch diameter for 4-1/2 inch stainless steel cup strainers. The cup strainer has a neoprene stopper.

## **2.06 LABORATORY TOPS**

- A. Top is one inch thick, molded from a modified epoxy resin and has optimum physical and chemical resistance. The specially compounded and cured uniform mixture, throughout the thickness of the top, is not dependent on a surface coating for chemical or stain resistance. Standard color is non-glaring black; however, other colors are available. Exposed edges and corners are radiused, and a drip groove is provided on under surface in areas where sinks are installed. Curb is four inches high.

## **2.07 FUME HOODS**

- A. Wood Superstructures: Hood superstructures provide the efficient removal of fumes, both heavy and light, with the least amount of turbulence from air entering the hood. Fume hoods with wood superstructures are conventional type, without air bypass. Velocity of air entering hood increases as the sash is lowered. Superstructure is constructed of 3/4 inch hardwood plywood with interior lining and baffles of glass-fiber reinforced, thermoset polyester, unless specified otherwise. Baffles are designed to remove gases heavier, or lighter, than air. Adjustable upper and lower dampers are provided, when specified. Vertical sliding sash is counter-balanced with weights on Monel metal cables, operating on ball-bearing nylon pulleys. Sash frames are 3 inches by 1-1/16 inch, solid hardwood and glazed with 1/4 inch thick, laminated safety glass. The sash has routed finger lifts and rubber bumpers provided. A duct stub for exhaust is provided in the top panel. One vapor tight, incandescent lamp is furnished when specified. Additional fume hood service fixtures are furnished when cataloged, or specified.
- B. Metal Superstructures: Hood superstructures provide the efficient removal of fumes, both heavy and light, with the least amount of turbulence from air entering the hood. Fume hoods with metal super- structures have double wall construction, flush interiors and one of the following three air foil fronts:
  1. Conventional: No air bypass provided. Velocity of air entering the hood increases as the sash is lowered.
  2. Air Bypass: Bypass feature provides relatively constant velocity of air through the face of the hood, regardless of the sash position.

3. Induced Air: Includes the features of Air Bypass air foil front, plus an auxiliary air chamber designed to be connected directly to the atmosphere. Up to 70 percent of the air passing through the hood may be provided from the outside source.
  - a. The exterior of the superstructure is fabricated of cold-roll steel with a chemical resistant, two-part, beige epoxy finish. Other exterior colors are available when specified. The bottom air foil facia is stainless steel. Inner lining and exterior finished panels are attached to a framework of 16 gauge steel. This framework is welded and bolted together to form a rigid assembly, and then painted with a rust-inhibitive finish. Unless specified otherwise, the interior is asbestos-free, composition stone, and is attached to the frame with stainless steel screws. Steel parts are treated with an iron phosphate bath to resist corrosion and insure adhesion of the finish. Finished end panels are removable to facilitate installation of the plumbing fixtures, piping, electrical fixtures, and wiring. The vertical sliding sash is made of 18 gauge steel, welded into a rigid frame. It has removable, stainless steel glass retainers for re-glazing, a full length finger lift, and is supplied with nylon glides on each side. Sash guides are stainless steel. The sash is glazed with 7/32 inch thick, clear, laminated safety glass, set in a "U" shaped neoprene channel. The sash is counter-balanced, using a single weight at the rear of the hood, attached to the sash with 1/16 inch diameter, plastic coated, aircraft type cable. Cable rides on six, 2 inch diameter, nylon ball-bearing pulleys.
  - b. The 1/2 inch thick, metal sash weight is located in the center back of the hood. The weight has plastic guides for ease of operation, and runs in roll-formed steel channels. Weight is drilled and sash cable is looped through and fastened with a crimp-type connector. A two tube, rapid start, vapor sealed, fluorescent light fixture is provided, without bulbs. Fixture is re-lamped from outside the hood. Service fixtures are provided, when specified.
4. Provide 18 ga. Steel enclosure from top of fume hood to the ceiling. Finish and color to match fume hood. Size to be 48"w X 29"d X required height to meet ceiling.

## **2.08 CASEWORK FINISH**

- A. Surfaces to be Finished: Exposed exterior surfaces, exposed interior surfaces of cabinets, and the inside of drawers, receive the full twelve step finishing process. The unexposed interior surfaces of cupboards, wall cases, upper cases, and tall cases also receive the full finishing process. Other unexposed surfaces are processed through eight of the finishing steps, which include a baked on protective coat of moisture and chemical resistant catalyzed sealer.
- B. Finishing Process: Prior to assembly lumber for doors, drawers and cabinets, and plywood for cabinets, are machine sanded with 120 grit, 180 grit, and finally, 220 grit sand paper. Flat surfaces receive two additional machine sandings: one in a orbital crossbelt sander with 40 micron and 60 micron grit sanding belts; and, one through a rotary polisher with 150 grit sand paper. Door and drawer front edges are machine sanded to a very smooth surface through a profile edge sander utilizing a 100-grit and a 150-grit paper. After assembly, drawers, doors, and casework are thoroughly examined and fine-finished by hand to provide a consistently smooth surface. Prior to the first application in the finishing process, items are placed in the dust-off booth where compressed air is used to remove loose fibers and dust. Selected surfaces are stained with NGR stain to the desired color and allowed to dry. Next a protective coat of moisture and chemical resistant, catalyzed sealer is applied. After flash drying, items are oven baked at 130 degrees F. Following a cool down period, surfaces that receive the final topcoat are carefully hand sanded and wiped clean. A topcoat of clear, catalyzed, conversion varnish is applied, allowed to dry, and then oven baked at 130 degrees F. The final topcoat provides chemical resistance, toughness, durability, and excellent color stability with a smooth finish and high-gloss luster.

C. Chemical Resistance: Method of testing: Non-volatile chemicals: Five drops of each reagent were applied to the surface and covered with a watch glass for sixty (60) minutes and the temperature maintained from 74 to 80 degrees F. At the end of this period, the reagents were flushed with water, the surface scrubbed with a soft bristle brush under running water, rinsed and dried. After thorough drying, the surface was evaluated. Volatile chemicals: The test areas were cleaned with a cotton swab soaked in the solvent to be used for the test, a one inch cotton ball saturated with the test solvent was then covered by an inverted two ounce wide mouth bottle to retard evaporation. The test period was for sixty (60) minutes and the temperature maintained from 74 to 80 degrees F.

1. Twenty-four hours after the test period, the test surface was scrubbed with a damp paper towel and dried with paper towels and evaluated. Volatile chemicals are indicated by a "bullet".
2. The finish of exposed surfaces is capable of withstanding the following chemicals with no effect:

• Acetic Acid - 50%	• Methyl Ethyl Ketone
Acetic Acid - 98%	• Naptha
• Acetone	Nitric Acid - 10%
Ammonium Hydroxide - 28%	Phosphoric Acid - 25%
• Benzene	Phosphoric Acid - 75%
• Carbon Tetrachloride	Potassium Hydroxide - 50%
• Ethyl Acetate	Sodium Carbonate - Saturate
• Ethyl Alcohol	Sodium Hydroxide - 10%
• Ethyl Ether	Sodium Hydroxide - 20%
Formaldehyde	Sodium Hydroxide - 40%
• Gasoline	Sulfuric acid - 25%
Hydrochloric Acid - 10%	• Toluene
Hydrochloric Acid - 10%	
Hydrochloric Acid - 10%	
• Methanol (Methyl Alcohol)	

3. Acids that have little to moderate effect on the finish of exposed surfaces are:
  - a. Nitric Acid - 30%
  - b. Sulfuric Acid - 70%

## 2.09 FABRICATION

- A. Factory assembly of casework in the largest components possible aids in the installation. Mortise and tenon construction with glued and screwed joints is used for maximum strength; and the use of precision jigs and clamps ensures square corners and plumb vertical surfaces.
- B. Fabrication of laboratory casework and equipment is completed to dimensions in the final, approved copy of shop drawings.

## 2.10 MISCELLANEOUS ITEMS

- A. Drench Shower Tester
  1. Provide drench shower tester equal to Bradley model S19-330ST.
  2. Tester shall be heavy duty tester which funnels water to floor drain for shower testing. Watertight funnel is 84" long with weighted bottom, constructed of chemical resistant material. Telescoping handle shall extend to 6'-0".

## PART 3 – EXECUTION

### 3.01 COORDINATION

- A. The General Contractor and Owner shall cooperate with the laboratory casework and equipment contractor to coordinate delivery and installation of the product.

### **3.02 INSTALLATION AND ADJUSTMENTS**

- A. Installation of casework must be plumb, level, true and straight, with no distortions. Use concealed shims as required. When laboratory casework or equipment butts against other finished work, scribe and cut for an accurate fit.
- B. Adjustments to casework and hardware may be needed for smooth operation of doors and drawers, without warp or bind. Lubricate operating hardware as recommended by the manufacturer.
- C. Equipment shall be installed prior to installation of floor finish material.

### **3.03 CLEANING AND PROTECTION**

- A. Inspect casework for damaged or soiled areas; remove, refinish, and touch-up as necessary. Leave area clean.
- B. Cover installed casework and equipment with 4-mil polyethylene film as protection against soiling. Advise General Contractor of procedures to protect installed casework and equipment from potential damage by other trades.
- C. Required temperature and humidity conditions, consistent with those to be maintained by Owner, must be established for installed casework. Advise General Contractor of these requirements.

### **3.04 DEMONSTRATION**

- A. A qualified representative will demonstrate operation procedures and maintenance of the installed equipment to the Owner's personnel. This demonstration may be set at Owner's convenience; however, it must be conducted within 60 days of final installation of casework.

**END OF SECTION**

**SECTION 11 5700  
CERAMICS KILN**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Ceramics Kiln

**1.02 RELATED SECTIONS:**

- A. Division 26 – Applicable Sections

**1.03 SUBMITTALS**

- A. Shop drawings, product data, and samples under provisions of Section 01 3000 – Administrative Requirements.
- B. Product Data: Submit product data including electrical requirements.
- C. Closeout Submittals:
  - 1. Submit under provisions of Section 01 7800 – Closeout Submittals.
  - 2. Maintenance Data: Include complete operating and maintenance manuals.
  - 3. Submit Material Safety Data Sheets under provisions of Section 01 7800 – Closeout Submittals for the following items:
    - a. All mastics, glues and adhesives
    - b. Fire doors (insulating material)

**1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with requirements of Section 01 6000 – Product Requirements.

**1.05 WARRANTY**

- A. Comply with requirements of Section 01 7800 – Closeout Submittals.
- B. Submit a written warranty, executed by the Contractor, Installer, and Manufacturer, agreeing to repair or replace the kiln that fails in materials or workmanship within the specified warranty period.
  - 1. Warranty Period: Two (2) years after date of Substantial Completion.

**PART 2 - PRODUCTS**

**2.01 MANUFACTURERS**

- A. Subject to compliance with requirements indicated herein, provide products of one of the listed manufacturers.
- B. Kilns:
  - 1. Olympic Kilns: [www.greatkilns.com](http://www.greatkilns.com)
  - 2. Paragon Industries, L.P.: [www.paragonweb.com](http://www.paragonweb.com)
  - 3. Skutt Ceramic Products: [www.skutt.com](http://www.skutt.com)
  - 4. Substitutions: Under provisions of Section 01 6000 – Product Requirements.

**2.02 KILN**

- A. Basis of Design: Olympic Freedom 2827HE
  - 1. Size: Firing chamber 3" brick, 28" diameter, 27" deep, 10 cubic feet.
  - 2. Control: Bartlett V6-CF (12-key) Electronic Controller
  - 3. Electrical Requirements: 208v, 1 phase

**2.03 ACCESSORIES**

- A. Mechanical Kiln Vent:
  - 1. Electrical: 115V, 60Hz, 1.1 amp
  - 2. CFM: 73
  - 3. Ducting Requirements: Up to 60 feet of 4" duct material—galvanized furnace ducting, flexible aluminum ducting or PVC ducting (maximum four 90° turns)

- B. Lid
  - 1. Provide counter weight lid lift system
- C. Steel Stand
  - 1. 8" tall kiln stand with no-mar rubber feet.

### **PART 3 - EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.02 INSTALLATION**

- A. General: Install according to manufacturer's written instructions. Install level, plumb, and true.
- B. Large Components: Ensure that large components can be moved into final position without damage to other construction.
- C. Comply with indicated requirements for installing service fittings, and electrical devices.

#### **3.03 ADJUSTING**

- A. Adjust moving parts for smooth operation. Verify that counterbalances operate without interference.

#### **3.04 CLEANING**

- A. Clean finished surfaces; touch up as required; and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.

#### **3.05 DEMONSTRATION**

- A. Demonstrate proper operation of kiln and accessories to Owner's designated representative.

**END OF SECTION**



**SECTION 11 5713  
VOCATIONAL SHOP EQUIPMENT**

**PART 1 – GENERAL**

**1.01 SECTION INCLUDES**

- A. Welding Booth Equipment

**1.02 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product data: Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
  - 1. Materials list of items proposed to be provided under this Section;
  - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements;
  - 3. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

**1.03 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. The contractor shall furnish a written guarantee warranting all materials, devices, equipment and workmanship to be free of defects for a period of one (1) year from the date of completion and acceptance. Any defects in materials, devices, equipment and workmanship which become apparent within the guarantee period shall be repaired and replaced by the contractor at his own expense and at no additional cost to the Owner.

**PART 2 – PRODUCTS**

**2.01 MANUFACTURERS**

- A. Basis of design is based on each specific piece of equipment and the manufacturer listed. Substitutions will be considered within the provisions listed in Section 01 6000 - Product Requirements.

**2.02 WELDING BOOTH**

- A. Manufacturer: Avani Environmental Intl., Inc.: [www.avanienviromental.com](http://www.avanienviromental.com)
- B. Product: Model WB-1055, with the following attributes;
  - 1. Dimensions: 60" x 60" x 96
  - 2. Booth Frame: 2" Square Tube; 11-Gauge
  - 3. Panel Construction: 12-gauge stitch welded steel wall with 1" welded square stock cross and bracing
  - 4. Welding Curtain Support: (2) Welding curtain bar brackets and bar for 1-piece vinyl welding curtain
  - 5. Fume Arm Bracket Stanchion: All 11-gauge, 24" long 2" square tube steel with 10" L x 6.5" W steel plate welded to the tube steel for Avani BR-006 fume arm bracket; (The BR-006 bracket is for 6-inch diameter hanging fume arms; stanchion can mount left, right, or center)
  - 6. Adjustable Feet: Legs to have adjustable feet for leveling from 1" to 4"
  - 7. Powder Coated: Booth is industrial powder coat; Color: Safety Blue
  - 8. Rear Shelf; 59" long x 18" deep; 11 gauge steel with 1.5-inch square tube under framing with 2 cross supports. Shelf is adjustable via a telescoping leg and key system; adjusts to 3 positions; 28", 32" and 36" above the floor
  - 9. Booths to have pre-drilled holes for mounting panels back-to-back, side-to-side or both options where required per the project layout
  - 10. The booth shall be structurally sound and engineered to support overhead ducting (from 8" Dia to 48" Dia) without having to suspend the ducting from overhead.

11. Provide explosion proof lighting.

## **2.03 WELDING BOOTH CURTIAN**

- A. Manufacturer: Avani Enviromental Intl., Inc.: [www.avanienviromental.com](http://www.avanienviromental.com)
- B. Product: Model XA Series, with the following attributes;
  - 1. Material: Flame Retardant Vinyl; (Material is to be approved for welding applications)
  - 2. Thickness: 14.0 Mil
  - 3. Dimensions: 6' W x 5' H x 14.0 Mil Thick
  - 4. Description: 1-Ply Curtain with Grommetted Top Edge for Curtain Ring Hardware
  - 5. Color: Safety Blue

## **2.04 STEEL FUME ARM**

- A. Manufacturer: Avani Enviromental Intl., Inc.: [www.avanienviromental.com](http://www.avanienviromental.com)
- B. Product: Hanging Steel Fume Arm Model 1620 (6" Dia x 7' L), with the following attributes;
  - 1. Dimensions: 6" Diameter x 7' L
  - 2. Arm Base: Cast aluminum or steel; 360 Degree Rotation with safety stop
  - 3. Arm Support: Heavy Duty, External Telescoping Spring Assembly
  - 4. Service Access: All parts are to be externally accessible; no internal parts requiring adjustment.
  - 5. Tube: 2-pieces, 25-gauge, steel tube; external powder coat; lower tube to have 2 grab handles and to be fitted with a manual damper with handle for air flow adjustment and cut-off.
  - 6. Flex Hose: 3 sections of hose rated for weld smoke collection; hose to have a wire-support helix and minimum 200 Deg F temperature rating.
  - 7. Flex Joints: Cast aluminum for the base and center joints; steel positioning assembly for the hood.
  - 8. Hood: Aluminum; Powder coated, 13-inch diameter with 360-degree (circular) steel ring handle.
  - 9. Hood Positioning: No restrictions to the positioning of the hood; hood can be turned perpendicular to the arm.

## **2.05 WELDING POSITIONER STAND**

- A. Manufacturer: Avani Enviromental Intl., Inc.: [www.avanienviromental.com](http://www.avanienviromental.com)
- B. Product: Welding Positioner Stand; Stand-Alone Series with C-Clamp WPS-SA72, with the following attributes;
  - 1. Design Description:
    - a. Welding positioner stand will be of circular pipe that will be secured to the floor and to the frame of the welding booth panel with floor anchors and bolts.
    - b. Positioner pole is a vertical pipe section 72" long with a base plate and bracket for structural connections
    - c. The positioner will have the following height adjustable features:
      - 1) A 2-piece extension arm fitted with an 8-inch C-Clamp; Clamp will have a steel weld slag protector on the clamp thread
      - 2) A 12" wide x 18" long welding table in 0.25-inch steel
    - d. Positioner will be installed into the welding booth (or facility) per the preferences of the end user.
  - 2. Positioner Material: All Schedule 40 Steel Pipe; Sizes to be 2", 1.5" and 1.25"; Plate steel required to be 0.25-inch
  - 3. Positioner Connections:
    - a. Base of stand pipe will have a 4" x 4" x 0.25-inch steel plate with 4 0.5-inch holes for bolting to table
      - 1) Top of stand pipe will have a 12" long x 3" wide plate with 2, 0.25-inch holes for bolting to the rear frame
      - 2) Connection plates to be seam welded to the respective points on the stand pipe

4. Adjustable 2-Piece Extension Arm with C-Clamp:
  - a. 2-Piece Design fitted with a sliding sleeve on the pole that is secured by 2 3/8-inch tightening points
    - 1) Extension arm to consist of 2, 18" long pipe sections of the 2 complimenting diameters noted below
    - 2) 2-piece extension arm to have one stationary section in 1.50" and one sliding section in 1.25"
    - 3) 1.50-inch stationary pipe to be seam welded to the sliding sleeve of the pole and will have 2 3/8-inch threaded tightening points at opposing sides to secure the 1.25-inch sliding extension pipe
    - 4) 1.25-inch extension pipe will be fitted with an 8-inch C-Clamp as described above welded to the end
    - 5) Tightening Points: All Steel Only; No non-metallic parts
5. Adjustable Welding Table:
  - a. 1-Piece Design featuring the same sliding sleeve used for the 2-Piece Extension Arm
  - b. Table plate to 0.25-inch steel; 12" wide by 18" long
6. Finish: Plain Steel; Unfinished; De-bur and polish only

## **2.06 WELDING TABLE**

- A. Manufacturer: Avani Enviromental Intl., Inc.: [www.avanienviromental.com](http://www.avanienviromental.com)
- B. Product: Fabricated Welding Table with the following attributes;
  1. Dimensions; 4' L x 2' D
  2. Table Top: 1/4" steel plate
  3. Table Legs: Legs to be 1/4" angle steel with 1/8" flat bar stock cross bracing; seam welded construction.
  4. Finish; Unfinished; De-bur and polish only

## **PART 3 – EXECUTION**

### **3.01 INSTALLATION**

- A. Install in accordance with approved submittals and manufacturer's instructions.
- B. This contractor shall do all fitting, fastening, connecting, leveling and placing of all Equipment as required to complete each item in its permanent position.

### **3.02 CLOSEOUT ACTIVITIES**

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.
- B. Demonstrate proper operation of equipment to Owner's designated representative.

### **3.03 ADJUSTING**

- A. Prepare equipment and systems in accordance with manufacturers' instructions and recommendations.
- B. Adjust for proper operation within manufacturer's published tolerances.

### **END OF SECTION**



**SECTION 11 6133  
THEATRICAL RIGGING SYSTEMS**

**PART 1 - GENERAL**

**1.1 SECTION SUMMARY**

- A. This specification describes the installation of the theatrical rigging equipment and stage drapery tracks at the Auditorium and Black Box.

**1.2 RELATED DOCUMENTS**

- A. Theatre Rigging Drawings ("TR" Series) and general provisions of the contract including general and supplementary conditions and Division 1 Specification sections apply to this section.

**1.3 SECTION INCLUDES**

- A. Coordination, provision, installation, inspection, commissioning, testing, documentation, instruction and warranties of Theatrical Rigging Systems.
- B. Plant, materials, equipment, transport and labor necessary to accomplish this and have a complete and proper System.
- C. Also includes:
  - 1. Required licenses and permits including payment of charges and fees.
  - 2. Any required fees for testing, documenting, and notary public services.
  - 3. Verification of dimensions and conditions at the job site.
  - 4. Provision of required pre-installation submittals and project record manuals.
  - 5. Installation in accordance with the contract document, manufacturer's recommendation, and in conformity with applicable codes and authority having jurisdiction.
  - 6. Extension of electrical service, including ground, to equipment locations.

**1.4 RELATED WORK**

- A. Section 11 6143: Stage Draperies.
- B. Section 26 5561: Theatrical Lighting Systems.
- C. Section 27 4116: Integrated Audio-Video Systems.
- D. Division 26: Electrical Work.

**1.5 REFERENCES**

- A. Published specification standards, tests or recommended methods of trade, industry or governmental organizations apply to Work in this section where cited below:
  - 1. American Iron and Steel Institute (AISI),
  - 2. American National Safety Institute (ANSI),
  - 3. American Society of Mechanical Engineers (ASME),
  - 4. American Society of Testing and Materials (ASTM),

5. National Electrical Manufacturer's Association (NEMA),
6. Occupational Safety and Health Administration (OHSA),
7. Underwriters Laboratories (UL),
8. Entertainment Services and Technology Association (ESTA)
9. Entertainment Technicians Certification Program (ETCP)

## **1.6 DESCRIPTIONS AND REQUIREMENTS**

- A. The following is intended to further describe the Work and clarify design intent and is not an exhaustive description of the Theatrical Rigging Systems. Refer to the Theatre Rigging Systems (TR Series) drawings for further information relating to this Section.
- B. Rigging System: Auditorium Stage
  1. The theatre stage rigging will consist of a series of overhead battens, including manual counterweight, motorized hoisted, and dead-hung types, as described on the drawings.
    - a. Manually operated single-purchase counterweight linesets shall be provided to support scenery, drapery, and miscellaneous user-installed equipment.
    - b. Motorized hoisted linesets shall be provided to support lighting fixtures and associated wiring devices.
      - 1) Each lighting lineset shall be equipped with double-pipe batten allowing integration of the lighting power and control plugging raceway.
      - 2) A cable-cradle style management system will provide electrical distribution to the batten assembly, ensuring a permanent means of electrical connection to the lighting system.
      - 3) Hoist motors shall be operated via wall-mounted running control panel (RCP) allowing hoist selection, run-stop positional control, hoist status display, and emergency stop (ESTOP) functions.
    - c. Dead-hung linesets shall be provided to support tracked masking drapery panels.
  2. Provide placards, signage, and labeling at operating positions and on battens as described in Part 2 below.
- C. Draperies & Hardware: Auditorium Stage
  1. Drapery for the stage platform shall consist of a main curtain with matching valence, masking legs and borders, a mid-stage act curtain, an upstage blackout curtain, cyclorama, and tab masking at either side of the stage.
  2. All drapery and associated hardware on the auditorium shall mount on utility hoist or counter-weight battens as described in the drawings.
    - a. The main curtain, mid-stage act curtain, and blackout curtain, each consisting of two (2) matched fabric panels, will part at their centers and draw open on a traveler track. The draw mechanism will be hand-operated, utilizing a sandbag-weighted tension block for the operating line. The main curtain shall fully clear the proscenium when opened.
    - b. The masking legs and tabs shall be track mounted; the operation will be by hand using walk-along track hardware.
    - c. Valence, borders, and the cyclorama will be fixed and tied directly to hoisted battens.
- D. Rigging and Drapery System: Black Box Theater
  1. Pipe Grid:
    - a. Shall be designed to accept the loads for the intended use.
    - b. Shall be suspended from overhead structure as described on the drawings.

- c. Primary support shall be from overhead; provide supplemental bridging strut as required for pipe-grid suspension hardware where structural constraints and obstructions may require its use.
- d. Support shall include side-wall blocking for supplemental support and to prevent lateral movement of the completed assembly and the equipment affixed.
- e. Components of the Theatrical Lighting System shall be integrated on the pipe grid.
- 2. Curtain Tracks
  - a. Provide walk along tracks to support a series of black velour masking panels conceal the walls within the room as described and scheduled on the drawings.

**E. General Requirements**

- 1. Each rigging component must include the quantity of wire rope lift lines, trim chains, compression sleeve fittings, pipe or truss batten sections, and all necessary hardware for a fully operable rigging system.
- 2. Draperies shall be constructed of professional grade fabric intended for use as stage curtains. All draperies will be certified as flame retardant as a result of either their inherent characteristics or chemical treatment in accordance with the AHJ.

**1.7 RESPONSIBILITY AND RELATED WORK**

- A. The drawings included with this specification convey general system concepts. The plans do not show complete and accurate building details. The Installer is responsible for making the field measurements necessary to establish exact locations, relationships, load capacities necessary for the installation of these systems. Coordinate the work with the General, Electrical and other related contractors as stated in Part 1.4, and the scheduled work of other trades.
- B. Conduit infrastructure system, including wire for AC Power and grounding for the Theatre Rigging Systems, shall be provided as part of the contract. Coordination between different disciplines is required to achieve a proper conduit system installation and power provisions for Theatre Rigging Systems. The electrical installation shall be in accordance with division 26 and the National Electric Code.
- C. Verify the requirements and integrate components of the theatre lighting power and control system mounted to rigging hardware.
- D. Supply accessories and minor equipment items needed for a complete system, even if not specifically mentioned in these Specifications or on the associated Drawings, without claim for additional payment.
- E. Notwithstanding any detailed information in the Contract Documents, it is the responsibility of the Theatrical Rigging Systems Installer to supply systems in full working order. Notify the Architect of any discrepancies in part numbers or quantities before bid. Failing to provide such notification requires Theatrical Rigging Systems Installer to supply items and quantities according to the intent of the Specifications and associated Drawings without claim for additional payment.
- F. Obtain all permits necessary for the execution of any work pertaining to the installation, or any operation by the Owner including any associated charges or fees.
- G. Execute all work in accordance with all Standard Authorities listed above, and all applicable State and Local codes, ordinances, and regulations. If a conflict develops between the contract document and the appropriate codes and is reported to the Architect prior to bid opening, the Architect will prepare the necessary clarification. Where a conflict is reported after contract award, propose a resolution of the conflict and, upon approval, perform work.

## **1.8 QUALITY ASSURANCE**

- A. Theatrical Rigging Installer's Qualifications: Firm experienced in the provision of systems similar in complexity to those required for this project; and meet the following:
1. No less than five years' experience with equipment and systems of the specified types under the same business name.
  2. Experience with at least five projects of comparable scale within the last two years.
  3. Employ only fully trained stage riggers and mechanics for the erection of the stage equipment.
  4. All theatrical rigging activity shall be supervised by an ETCP certified theatre rigger.
  5. The stage riggers will be completely familiar with the type of equipment to be installed. A competent and knowledgeable Job Superintendent will be on the job at all times when work is in progress.
  6. Maintain a fully staffed and equipped service facility.
  7. Contractor shall attend pre-installation meetings to coordinate with other trades as required.

## **1.9 PRE-INSTALLATION SUBMITTALS:**

- A. The submittal information required by the specification is to be presented complete and as submissions noted below. Submittals are a crucial and integral part of the construction process; as such the Owner's consultant will not recommend payment to the installer above 25% of the scheduled value of this work until all submittal information has been approved. Cost for the Owner's consultant to review secondary and re-submittals due to the Installer's failure to include all required submittal information, or rejection of incomplete or improperly prepared submittal information will be the responsibility of the Installer. The cost shall be based on the hourly rates of the Architect and his consultants as published in their current professional fees schedules and shall also include reimbursable costs for delivery, mailing, and photocopies at direct cost-plus ten percent (10%).
- B. Project Submittal Part 1:
1. Provide for approval not later than thirty (30) days after issuance of Notice to Proceed and prior to commencement of Work:
    - a. Section 1: A complete schedule of submittals.
    - b. Section 2: A chronological schedule of Work in bar chart form. Revise and resubmit schedule as required to reflect construction progress.
- C. Project Submittal Part 2:
1. Provide for approval no later than sixty (60) days after issuance of notice to proceed and in accordance with previously submitted submittal schedule.
    - a. Section 1: Complete list of products to be incorporated within the Work.
    - b. Section 2: Manufacturer's data sheets for each product. Provide original manufacturer's data sheets in order as they appear in the specification. These data sheets are submitted for each product in sufficient detail to facilitate proper evaluation to the products suitability for incorporation within the Work.
    - c. Section 3: Fabric Samples. Submit a sample book of each fabric specified, containing manufacturer's standard colors available in the quality of fabric specified for the Owner's selection and approval of color. More than one color may be selected. After selection, upon request, submit one square foot sample of each fabric in each color for final review.



- d. Section 4: Submit Material Safety Data Sheets (MSDS) for each potentially hazardous material prior to use. Include information pertaining to the hazardous material with the MSDS.
- 2. Drawings:
  - a. Provide computer software generated drawings using standard industry graphic standards. Hand or poorly drawn documents will not be accepted. All drawings shall be created on a computer aided drawing (CAD) system compatible with AutoCAD release 2010. Electronic files of theatrical rigging contract documents shall not be distributed for use in generating submittal documents with the exception of architectural backgrounds.
  - b. Drawings depicting attachment of equipment to structure or mechanical assemblies that support overhead loads must show the work has been reviewed and sealed by a structural engineer licensed to practice in the State of Texas.
  - c. Installation Drawings. Provide drawings showing special details depicting methods and means specific to each product and each product manufacturer's recommended installation methods and means. Provide assembly and attachment for each product. Drawings should be reviewed and sealed by a structural engineer licensed to practice in the State of Texas.
  - d. Schematic Drawings. Provide drawings detailing inter-component and intra-component, on Theatrical Rigging Installer assembled components or fabricated products.
  - e. Conduit and Electrical Drawings. If the system incorporates an electrical or electronic system of any type, provide floor plan drawings, including all walls, doors and rooms, showing exact power requirements and conduit routing for each system with the location of all junction boxes, terminations, etc.
  - f. Equipment Drawings. Provide equipment mounting and location details including necessary physical dimensions, clearances, load limits, etc.
  - g. Software diagrams showing the hierarchical structure of operator screens and functions with sample screen shots.
  - h. Floor plan and Section Drawings. Provide drawings showing the exact location of all installed equipment on floor plans and/or sections such as guide wires or tracks, loft blocks, battens, etc.
  - i. Custom Enclosures and Millwork Drawings. If custom enclosures or millwork is required, provide full fabrication detail drawings indicating size, material, finish and openings for equipment.
  - j. Fabricated Plates, Panels, or Signage Drawings. If plates, panels, or signage is required, provide complete drawings depicting dimensioned locations of components, component types, engraving or printing information, plate material and color, and bill of material.
  - k. Labeling Drawing. Provide representative equipment labeling scheme of locking rail, loading rail, etc.
  - l. General Detail Drawings. Provide detail drawings depicting any unique installation methods specific to each product.
  - m. Any other pertinent data generated which is necessary to provide the Work.
- D. Submittal Format:
  - 1. Electronic submission of submittals is encouraged. Where non- electronic submittals shall be bound in a three-ring D style binder sized for 150% of the material with a maximum size being a three inch spine. Use multiple volumes if necessary.
  - 2. Provide each submittal with a unique number and be numbered in consecutive order.
  - 3. Provide each submittal binder with a cover and a spine reflecting the project title and submittal number.
  - 4. Provide each submittal with a complete table of contents with the following information:

- a. Project title and number.
  - b. Submittal number. In the case of a re-submittal, use the original submittal number immediately followed by the suffix "R" immediately followed by a unique number and be numbered in consecutive order.
  - c. Date of submission.
  - d. Referenced addendum or change-order number as applicable.
  - e. Referenced specification Section, Part, Article, Paragraph and page number or drawing reference as applicable.
  - f. Index Product Data sheets by manufacturer and model or part number.
5. Separate major grouping with labeled binder tabs.
  6. Arrange product data list in alpha-numeric order when applicable followed by unspecified product arrange by manufacturer and model or part number. Follow list by manufacturer's data sheets, arranged in the same order. If a data sheet shows more than one product, indicate the model being proposed with an arrow or other appropriate symbol.
  7. Drawings executed at an appropriate scale, not smaller than  $\frac{1}{8}" = 1'-0"$  for conduit/floor plans,  $\frac{1}{4}" = 1'-0"$  for equipment layouts, and  $\frac{1}{2}" = 1'-0"$  for mounting details and plate/panel details.
- E. Submittal Copies:
1. These requirements represent minimum project requirements; a project's general conditions may require additional copies for project distribution.
  2. Electronic submission of submittals is encouraged. Where non-electronic documents are required, submit all documents electronically in PDF format.
  3. Where hardcopy submittals may be required,
    - a. Submit (3) bound prints of all drawings.
    - b. Submit (3) copies of bound materials (e.g., product submittals).
    - c. Submit (2) sets of product or sample finishes as required within this specification.
- F. Resubmission Requirements:
1. Make any requested corrections or change in submittals required. Resubmit for review until no exceptions are taken.
  2. Indicate any changes that have been made other than those requested.
- G. Approval of Submittals: The submittal information will be reviewed by the general contractor, owner, Architects, engineers, and consultant. Each submittal package will be returned, stamped as follows:
1. "No Exceptions Taken" proceed with construction, all job site coordination will be at the direction of the general contractor.
  2. "Make Corrections Noted: No Resubmission Required" submittals have been returned with conditional approval. Corrections, as indicated on the returned drawings and/or specifications, must be made before construction can begin.
  3. "Make Corrections Noted: Submit Corrected Copy" submittals have been returned with conditional approval. Corrections, as indicated on the returned drawings and/or specifications, must be made in writing and returned to the consultant before construction can begin.
  4. "REJECTED, Submit Specified Item" a specified item in the submittal has been rejected for the reasons noted. Re-submit in compliance with the specifications.
  5. "REJECTED, Revise and Re-submit" submittal has been rejected for the reasons noted. Re-submit in compliance with the specifications.
  6. "No Review Action Required" all information provided was for information or coordination purposes only. Review is not required.

## **1.10 PROJECT RECORD MANUAL**

- A. Submit three bound original sets (this is a minimum of two for the Owner and one for the Architect's consultant; additional copies may be required by the project's general conditions) after substantial completion and prior to final inspection.
- B. The Project Record Manual shall be segregated into three separate bindings as follows:
  - 1. Operations Manual:
    - a. Product Data: Product actually incorporated within the Work:
      - 1) Manufacturer's data for each type of product conforming to the scheme above. The list shall include manufacturer's serial numbers.
      - 2) Owner/Instruction Manual for each product.
      - 3) For custom circuits or modifications, a description of the purpose, capabilities, and operation of each item.
      - 4) Manufacturer's wiring diagram for each type of product actually incorporated.
      - 5) Separately bound list by manufacturer and model or part number of all products incorporated within the Work arranged in alphanumeric order.
    - b. Record drawings: Final rendition of that specified depicting what is actually incorporated within the Work. Provide one (1) full size set and one (1) DVD-ROM containing all CAD generated drawings prepared in conjunction with this project. Drawing files to be in AutoCAD Release 2010 DWG format.
    - c. Test Reports: Recorded findings of testing specification of this specification.
    - d. System Operation and Instructions: Prepare a complete and typical procedure for the operation of the equipment as a system, organized by subsystem or activity.
      - 1) This procedure should describe the operation of all system capabilities.
      - 2) Assume the intended reader of the manual to be technically experienced but unfamiliar with the components and the facility.
  - 2. Service & Maintenance Manual:
    - a. Provide an original copy of the service manual on every piece of equipment for which the manufacturer offers a service manual. Arrange manuals in the same order as the operations manual.
    - b. Manufacturer's maintenance and care instructions.
    - c. Maintenance Instructions, including maintenance phone number(s) and hours; maintenance schedule; description of products recommended or provided for maintenance purposes, and instructions for the proper use of these products.
    - d. Replacement parts list of all minor equipment such as fuses, lamps, connectors, knobs, etc.
  - 3. Warranty Manual:
    - a. Manufacturer's warranty statements on each product.
    - b. Date of substantial completion and ending dates for warranties for each group of products.
    - c. Software registration and licenses.
- C. Include any other pertinent data generated during the Project or required for future service.
- D. Appropriately duplicate data within the separate bindings when it will reasonably clarify procedures, e.g., operational data in maintenance binding.

## **1.11 DELIVERY, STORAGE, AND HANDLING**

- A. Ship product in its original container, to prevent damaging or entrance of foreign matter.

- B. Handling and shipping in accordance with manufacturer's recommendation.
- C. Provide protective covering during construction, to prevent damaging or entrance of foreign matter.
- D. Replace at no expense to Owner, product damaged during storage, handling or the course of construction.

#### **1.12 PROJECT CONDITIONS**

- A. Verify conditions on the job site applicable to this work. Notify Architect in writing of discrepancies, conflicts, or omissions promptly upon discovery.
- B. The Drawings diagrammatically show arrangements of equipment fitting the space available without interference. If conditions exist which make it impossible to install work as shown, recommend solutions and/or submit drawings to the Architect for approval, showing how the work may be installed.

#### **1.13 FINAL INSPECTION AND TESTING**

- A. Upon completion of installation, initial adjustments, tests and measurements specified in Part 3, and submission and review of the results, a final inspection and test will be observed by the Architect and/or Architect's Consultant no earlier than two weeks after receipt of the written results.
- B. Provide a minimum of one (1) person for inspection and two (2) persons for testing familiar with aspects of the System to assist the Owner.
- C. The process of testing the System may necessitate moving and adjusting certain components such as counterweights on arbors, adjustment of drapery tracks, etc.
- D. Testing includes operation of each major system and any other components deemed necessary. Perform tests and provide required test equipment, tools and material required to make any necessary repairs, corrections, or adjustments.
- E. The following procedures will be performed on each System:
  - 1. Inspection of the methods and means employed to incorporate the System within the facility.
  - 2. Verification of proper operation, from controlling devices to controlled devices.
  - 3. Verification of proper adjustment, balance, and alignment of equipment for optimum quality and to meet the manufacturer's published specifications. Establish and mark normal settings for each setting, and appropriately record these settings within the Record Documents.
  - 4. Other tests on equipment or systems deemed appropriate.
- F. In the event the need for further adjustment or work becomes evident during testing, the Theatrical Rigging Installer is to continue his work until the System is acceptable at no addition to the contract price. If approval is delayed because of defective equipment, or failure of equipment or installation to meet the requirements of these specifications and any extension of the inspection and testing period is required, the contract price will be reduced for the additional time and expenses of the Owner, at the standard rate in effect at that time.

- G. Rigging system installer shall return to the jobsite six months after acceptance to inspect the rigging hardware and attachments, curtain tracks, curtains, and battens.

#### **1.14 WARRANTY**

- A. Warrant labor and product for two (2) years following the date of substantial completion to be free of defects and deficiencies, and to conform to the drawings and specifications as to kind, quality, function, and characteristics. Repair or replace defects occurring in labor or product within the Warranty period without charge. Any cost required to complete this warranty repair is the responsibility of the contractor.
- B. This warranty is in addition to any specific warranties issued by manufacturers for greater periods of time.
- C. Within the warranty period, answer service calls within eight hours, and correct the deficiency within twenty-four hours.

#### **1.15 INSTRUCTION OF OWNER PERSONNEL**

- A. After final completion, provide instruction to Owner and/or the Owner's designated personnel on the use, operation, maintenance and care of the System.
  - 1. Develop training course based on the use of the System and manufacturers' recommendation. Provide (8) hours of training. The training period shall be divided into two segments and shall be scheduled at least two weeks apart. All training shall be scheduled at the convenience of the owner and designated personnel.
  - 2. Submit an outline of the course with sample instructional aids for approval (30) days prior to scheduled instruction sessions.
  - 3. If a representative of the manufacturer is used in the instructional course, the Theatrical Rigging Systems Installer must be present throughout the extent of the course and ensure that the representative abides by the requirements set forth in these specifications.
- B. Rigging system installer shall be present at the first two (2) uses of the facility.

### **PART 2 - PRODUCTS**

#### **2.1 ACCEPTABLE MANUFACTURERS**

- A. Model name and number for manufacturers included in this specification are listed to establish a standard of product quality.
- B. Substitution of specified products with other qualified manufacturers and products will be considered providing:
  - 1. Proper substitution procedures outline under Division 1 is adhered to.
  - 2. A request for substitution of each specific product must be made in writing by a bidding Contractor not less than ten (10) business days prior to bid for written approval of the Architect.
  - 3. Sufficient data of the products is presented for prior approval including technical data, manufacturer's specifications, samples, and, if requested, results of independent testing laboratory tests.

- 4. Written permission is obtained for the substitution from the Owner or Owner's Representative.
- C. If proposed system includes equipment other than specified model numbers, submit a list of major items and their quantities, with a one-line schematic diagram for review. Include a list of previously installed projects using proposed equipment that are similar in nature to specified System.
- D. Provide product not specifically specified commensurate with the quality and standards established by the specified product.

## **2.2 GENERAL**

- A. Products shall be new, free from defects and listed by UL when an applicable UL Standard exists. Provide product of a given type from one manufacturer.
- B. Regardless of the length or completeness of the descriptive paragraph herein, provide product complying with the specified manufacturers' published specifications.

## **2.3 CONTACTS**

- A. Listed below is contact information for Manufacturers of rigging components approved to provide equipment on this project:
- B. Automatic Devices Company
  - 1. 2121 S. 12th Street, Allentown, PA. 18103
  - 2. Telephone: (610) 797-6000
  - 3. Approved to supply curtain track and curtain motors.
- C. J.R. Clancy
  - 1. 7041 Interstate Island Road, Syracuse, NY 13209
  - 2. Telephone: (315) 451-3440
  - 3. Approved to supply stage rigging components, motorized hoists, hoist control, fire safety curtains and accessories, beam clamps, and associated hardware.
- D. Crosby Group, Inc.
  - 1. P.O. Box 3128, Tulsa, Oklahoma 74101
  - 2. Telephone: (918) 834-4611
  - 3. Approved to supply rigging hardware including chain, cable clips, cable, and anchor shackles.
- E. Electronic Theatre Controls
  - 1. 3031 Pleasant View Rd, PO Box 620979, Middleton WI 53562
  - 2. Telephone (608) 831-4116
  - 3. Approved to supply rigging hoists and controls.
- F. H&H Specialties
  - 1. P.O. Box 9327, South El Monte, Calif. 91733
  - 2. Telephone: (213) 283-3562
  - 3. Approved to supply stage rigging loft/head blocks, curtain tracks, and curtain motors.

G. K&M Fabrics

1. 2 Waco Street, Greenville, South Carolina 29611
2. Telephone: (800) 845-1896
3. Approved to supply curtain fabric.

H. J.B. Martin

1. 445 rue St-Jean-sur-Richelieu, Quebec, Canada J3B 2M1
2. Telephone: (514) 346-6853
3. Approved to supply curtain fabric

I. Rud Stage Rigging

1. 1300 Stoney Point Road SW, Cedar Rapids, Iowa 52408
2. Telephone: (800) 553-7993
3. Approved to supply rigging hardware including chain and shackles.

J. Safety Technology International, Inc.

1. 2306 Airport Road, Waterford, MI 48327
2. Telephone: (248) 673 9898
3. Approved to supply polycarbonate device covers.

K. Texas Scenic Company

1. P.O. Box 680008, San Antonio, Texas 78268
2. Telephone: (210) 684-0091
3. Approved to supply rigging Hoists and controls, rigging hardware, stage drapery, fire curtain systems.

L. Ver Sales, Inc.

1. 2509 N. Naomi Street, Burbank, Ca. 91504
2. Telephone: (818) 567-3000
3. Approved to provide rigging hardware including chain and beam clamps.

## 2.4 COMPLETED SYSTEM

A. General

1. All installation of stage rigging equipment shall be completed utilizing new materials, free from flaws and rust, and in good working order. The jobsite shall be cleaned of all packing materials, lubricants, metal shaving, miscellaneous hardware, and components not used in the installation.
2. All dimensions are to be field verified. Location and attachment of hardware and size of components shall be confirmed by the stage rigging installer.
3. All electrical power, outlets, related systems, and structural elements required to make the system fully functional are the responsibility of the contractor.
4. If components and hardware are not specifically specified or called out, it is the responsibility of the contractor to provide those components in order to provide a fully operational theatre rigging system.

## 2.5 RIGGING HARDWARE

A. Batten Assembly

1. Pipe battens shall be constructed of new ASTM A53/A 1-1/2" nominal schedule 40 plain end steel pipe.
2. Battens exceeding one standard pipe length will be joined using an internal splicing sleeve. Splices must provide the same overall capacity, deflection, and strength to the pipe battens as an un-spliced span. Threaded couplers are not permitted.
  - a. Splice sleeves shall be a minimum of 24" in length with a minimum of 12" extending into each pipe batten.
  - b. Sleeves will be machined to a diameter that will create a snug fit within the pipe battens.
  - c. Splicing sleeves will be fastened to the pipe batten with pins or 3/8" diameter bolts. Locate at least two fasteners on each side of splice joint; alternate direction of fasteners at right angles to one another across the diameter of the pipe.
3. Any fasteners used on pipe battens must meet SAE grade 5, and be equipped with self-locking nuts.
4. Cover the end of each batten with a yellow or white closed end, soft vinyl safety cap at least 4 inches in length. Cap shall display linesets maximum capacity, and lineset number.

B. Batten Connections

1. Wire rope lift lines shall terminate directly to trim chains constructed of NACM chain certified by their manufacturer as suitable for the intended purpose.
2. Chain shall be 1/4" diameter or larger, and of sufficient length to wrap one and one-half times around the pipe batten and return to the eye of the wire rope lift line.
3. One chain end shall be terminated directly to the wire-rope eye, the other end secured with a forged screw pin anchor shackle rated for the intended purpose. The screw pin shall be moused or seized to ensure the pin will not release.
4. Alternative designs for batten connection and trimming methods shall require approval as part of the submittal process.
5. Where a pipe clamp may be required on a batten, a wrap-around type clamp shall be provided. This clamp shall be secured to the pipe using SAE 5 grade bolts, washers, and self-locking nuts.
6. Acceptable products:
  - a. Clancy Alpha Chain
  - b. 7 mm (0.275") Grade 63 alloy chain

C. Wire Rope Lift Lines

1. Provide lift lines and fittings appropriate for supporting the load requirements.
2. For utility and drapery sets:
  - a. Lift lines shall be a minimum of 3/16" diameter 7 X 19 construction, galvanized aircraft cable with a breaking strength of 4200 lbs.
3. For shell and stage electric sets:
  - a. Lift lines shall be a minimum of 1/4" diameter 7 X 19 construction, galvanized aircraft cable with a breaking strength of 7000 lbs.
4. All wire rope must be new; damaged or deformed cable may not be used.
5. Exposed ends of wire rope shall be cut cleanly, then seized.

D. Wire Rope Termination

1. To connecting hardware, form eyes around an appropriately sized thimble using copper Nicopress® compression sleeves.



2. To cable drums: terminate the wire rope on the inside of the lifting drum using a Nicopress® compression stop sleeve.
3. Supply and install compression sleeves or clips in size and quantity per guidelines set forth in the Wire Rope User's Manual, by its manufacturer's specifications, and in accordance with industry guidelines.

E. Rigging Accessories:

1. In certain instances special component parts, such as sheaves, idler blocks, extra lines, etc., will be necessary in order to provide a fully operable system. Where such requirements are necessary, furnish, install, and adjust these components comparable to the quality of the products listed in these specifications.
2. Acceptable manufacturers:
  - a. H&H Specialties
  - b. JR Clancy
  - c. Crosby

## 2.6 COUNTERWEIGHT LINESETS

A. Head Blocks:

1. Provide a top-hung head block sized to accommodate
  - a. the size and number of lift lines required by the design,
  - b. the specified loading on the system, and
  - c. the steel beam(s) on which the block will mount.
2. 12-inch diameter sheaves shall be fitted with 1" tapered roller bearings, properly sized for the required load and speed. The 1" diameter machined steel shaft shall have a dutchman to engage a keyhole in the side plate. Proper adjustment of the bearing shall be accomplished by means of a fine thread, self-locking nut on the opposite end of the shaft.
3. Sheave shall be cast-iron type.
4. Sheave shall be grooved for 1/4" wire rope lift cables to meet wire rope manufacturer's recommended practice for both clearance and 30° throat taper.
5. Sheave shall be grooved for 3/4" fiber operating rope.
6. Side plates: 10 gauge plates welded and bolted to base. Side plates shall be secured with tubing spacers and grade 5 bolts and lock nuts, forming a rigid housing to prevent the lift lines from leaving their grooves.
7. Steel base angles and clamping hardware shall be designed to accommodate the loads imposed by the rigging system and be designed to mount on the structure provided.
8. Provide quantity as required.
9. Acceptable product:
  - a. H&H model 71250C25 .
  - b. Clancy model 1CS-61255R.
  - c. or approved equal"

B. Loft Blocks:

1. Provide an under-hung loft block sized to accommodate the size of lift lines and loads required by the design.
2. Size: 8" diameter sheave shall be fitted with 5/8" ball bearings, properly sized for the required load and speed. The 5/8" diameter machined steel shaft shall have a dutchman to engage the keyhole in the side plate. Proper adjustment of the bearing shall be accomplished by means of a fine thread, self-locking nut on the opposite end of the shaft.
3. Construction: loft block will be Nylatron GS type.

4. Grooves: loft block will be grooved for 1/4" wire rope lift cable to meet wire rope manufacturer's recommended practice for both clearance and 30° throat taper.
5. Side plates: 10 gauge plates welded and bolted to base. Side plates shall be secured with tubing spacers and grade 5 bolts and lock nuts, forming a rigid housing to prevent the lift lines from leaving their grooves.
6. Steel base angles and clamping hardware shall be designed to accommodate the loads imposed by the rigging system and be designed to mount on the structure provided.
7. Provide quantity as required.
8. Provide integrated idler pulleys as required.
9. Acceptable product:
  - a. H&H model 830N25
  - b. Clancy model 2NC-10819R

C. Tension Blocks

1. The cast iron sheave shall have a 10" outside diameter, and shall be an ASTM A48 Class 30 grey iron casting, with a machined groove for a 3/4" rope.
2. The sheave shall be equipped with a machined steel shaft and two sealed, precision ball bearings.
3. Side plates shall be a minimum of 3/16" steel plate.
4. Blocks shall have a minimum weight of 40 lbs. to properly tension the hand line.
5. A kick tab shall be provided to permit adjustment of the rope tension.
6. Floor blocks shall mount to the guide track by two matching guide shoe assemblies.
7. Acceptable product:
  - a. H&H model 1070C75
  - b. Clancy model 6CR-1015.

D. Counterweight Arbors

1. Provide a steel assembly designed to carry counterweight and to terminate wire-rope lift lines and operating lines on a matching guide track.
2. Arbor lengths shall be adequate to accommodate the counterweight stack necessary to balance the lineset's specified load capacity.
3. Arbor tops shall be a 1/4" steel plate formed into a channel with 3" sides. Channel shall be punched to terminate lift lines and to accommodate a bolt and spacer providing a tie-off point for the hand line.
4. Arbor bottoms shall be of similar construction, with counterweight rests to keep the weights from resting on the inner arbor rod nuts.
5. Two 3/4" diameter steel arbor rods and a 3/8" x 3" steel back plate shall fasten between the channels. The arbor rods shall have three nuts at each end, the outermost being a lock nut.
6. Provide two guide assemblies secured to each arbor. Guides shall be UHMW-PE between steel backing plates.
7. Provide a minimum of two spreader plates adequate to stack between counterweights on 2-foot centers. Provide a retaining collar with 1/4" set screw on each rod. Label the arbor to indicate the proper locations for the spreader plates.
8. Provide quantity as required.
9. Acceptable product:
  - a. H&H model 991x6 and 991x9
  - b. Clancy model 007-15x09

E. Arbor Guide Tracks

1. Provide a system of extruded aluminum J-shaped guide tracks mounted to the wall of the stage to accommodate the travel of the counterweight arbors as described on the drawings.
2. Guide tracks shall be fastened to horizontal wall battens having a maximum center spacing of 5'-0".
3. Wall battens shall be attached by adjustable knee brace assemblies designed to accommodate irregularities along the mounting wall.
4. Install arbor stops across the guides at the top and bottom limits of travel. Stops shall be minimum 1-3/4" x 1-3/4" x 3/16" steel angle. A nominal 2" x 2" hardwood bumper capped with a 1/2" thick rubber strip shall bolt to the arbor stops.
5. Provide quantity as required.
6. Acceptable product
  - a. H&H series 66x
  - b. Clancy series 12-1650.

F. Counterweights

1. Fabricate counterweights from flame or laser cut steel plate as described on the drawings. Finish free from slag and sharp edges.
2. Size: nominal 6" wide X 14" long and slotted to accommodate the specified arbor rods. The thickness of counterweights shall not vary more than 3/16" from nominal dimension
3. Finish: weights used to balance the empty pipe batten shall be painted red. All remaining weights (those used to balance live loads) shall be painted black.
4. Counterweight shall be stored on the elevated loading platform.
5. Provide 75% total number of pieces at 1-1/2" thick with the balance at 3/4" thick.
6. Quantity:
  - a. 14,500 lbs total.

G. Locking Rail

1. Provide an elevated locking rail punched to receive rope locks on 8-inch centers mounted on the gallery level as described in the drawings.
2. Rope locks and index cards shall be mounted on a formed steel angle no smaller than 3-1/2" x 5" x 1/4".
3. The onstage edge of the rail shall be sloped and punched to receive formed clips which hold index cards centered on the installed sets. Provide one numbered plastic write-on card for each installed set.
4. Stanchions made from 2" steel tubing shall be provided on 5' (maximum) centers. Provide a safety barrier of expanded metal mesh between stanchions.
5. The entire locking rail shall be designed and installed to withstand a minimum up load of 500 pounds per foot.
6. Acceptable product:
  - a. H&H model 578 series
  - b. Clancy model 011-558 series

H. Rope Locks

1. Provide rope locks fabricated from ASTM A536 ductile iron including housing, cams and handle. The housing shall allow the use of a standard padlock to hold the handle in its closed position.
2. In order to reduce noise during operation, there shall be a rubber bumper in the housing to silence the handle when it is opened. The dogs that grip the rope shall be machined to fit closely to reduce noise, and shall not require the use of washers.
3. Adjustment for rope shall be from 5/8" to 1" by means of a 1/2" nylon tipped, socket head adjustment screw with lock nut at the rear of the housing.

4. The handle shall be 9" long with a nylon powder or vinyl dip coating. The handle shall be installed so that it passes two degrees past vertical to lock the hand line.
5. A coated, oval, welded steel ring shall be provided as a safety lock.
6. The rope lock shall mount to the locking rail with four 3/8" hex bolts and lock nuts.
7. Acceptable product:
  - a. H&H model 576-9
  - b. Clancy model 010-533R.

I. Operating Line

1. Provide a three-strand twisted rope constructed of filament and staple/spun polyester wrapped around a polyolefin core.
2. Minimum tensile strength: 10,500 lbs
3. Color: white
4. Size: 3/4 inch diameter
5. Acceptable product
  - a. Multiline II
  - b. Clancy SureGrip

J. Index Strip

1. Provide a UL-listed LED index lighting strip suspended above the locking rail as described on the drawings.
2. The lighting strip case exterior shall be finished flat black.
3. The fixture shall support two-circuit operation (both white and blue). Integrate the fixture with the stage lighting system.
4. Acceptable product:
  - a. LUMENesce RAILite
  - b. Texas Scenic Company Inline Rail Light

K. Placards and Signage

1. Provide placards and signage at the locking rail and loading mezzanine indicating:
  - a. The number/name and load capacity of the linesets, and
  - b. Proper loading and operating procedures.
  - c. Number all linesets at the loading rail.

## 2.7 BATTEN HOISTS

- A. Each batten location shall have a single hoist machine horizontally mounted with an under-hung attachment to structural steel. Hoists shall be located and sized to the loads as described in the TR series drawings.
- B. Variable speed hoists shall lift the batten at a user selectable rate between nominal 0 to 120 ft/min. Fixed speed hoists shall lift the batten at a nominal 20ft/min.
- C. Hoists shall be of an integrated design containing the following:
  1. An IEC standard totally enclosed fan cooled (TEFC) NEMA MGI brake motor with an integral spring-set, electrically released brake capable of providing a retarding torque of at least 200% of the rated full load motor torque. The brake must provide fail-safe operation in holding the load while the motor coils are de-energized. The motor control scheme must ensure that the brake not release unless the motor has developed adequate holding or lifting torque upon energization. The brake shall have a provision for manual release for use in commissioning and maintenance.

2. A gearbox assembly with triple shaft oil seals, and a minimum service factor of 1.25. The use of chain sprockets, timing belts, or similar non-integral connections in the power train is not permitted.
  3. A secondary load brake directly attached to the reducing gearbox output shaft which shall be self-applied capable of controlling the load in standard braking mode as well as in a manner that prevents runaways and shock load.
  4. A single drum onto which the batten lift lines will spool. The drum shall be fabricated from Nylatron® of a thickness suitable for the load and long enough to store a quantity of wire rope sufficient to allow the specified load travel plus three additional wraps in a single layer. The drum shall have a helical groove sized properly for the specified wire rope and with a minimum pitch diameter of 30 times the rope diameter.
  5. An industrial rotary cam limit switch assembly providing normal end-of-travel and emergency over-travel signaling to the MCC and RCC. Traveling-nut type switch assemblies are not acceptable for use. The limit assembly shall provide a minimum of four (4) two for each direction of travel as noted above. Selection and gearing of the limit assembly must allow the driven load to stop at a repeatable position with 1/8 inch of accuracy. Limit assemblies may be directly coupled to the drive train, or may be driven using roller chain or toothed (timing) belts with the provision that these latter are fully guarded.
  6. Solid state position encoders integrated with the mechanical and electronic controls to provide a minimum 1/8" repeatable positioning accuracy.
  7. A UL listed variable speed drive supplying each hoist motor must provide full lifting or holding torque at zero speed up through 100% of the motor's rated speed.
  8. A local means to disconnect its motor from the power supply.
- D. Provide wireway, cabling, cabling, and connectors for separate low-voltage control circuits and 480V power to each hoist. Cabling shall conform to the hoist manufacturer's specifications.
- E. Lineset Hoist Configurations
1. Motorized lighting linesets
    - a. Install new linesets equipped with fixed speed motorized hoists over the stage platform as located on the drawings. Each lineset will consist of a double batten with wire rope lift lines in quantity and location as specified on the drawings.
    - b. The lineset assembly shall include the mounting of lighting power distribution and control components as specified on the drawings and provided by theater lighting contractor.
    - c. The hoisting system and its components shall be sized to the load capacities as specified on the drawings.
    - d. Provide a motorized hoist for each of the lighting battens as located and described in the drawings.
    - e. The hoist shall lift the batten at a nominal rate of 20 ft/min.
    - f. The electronic drive supplying the hoist motor must allow field adjustable acceleration and deceleration rates in order to minimize the effects of dynamic or shock loading on the system.
    - g. Lighting Equipment Integration
      - 1) Cable Management
        - a) Provide pantograph style management device(s) for each lighting lineset as a means to provide a permanent electrical connection for the lighting system circuits and controls to the battens.
        - b) Provide cable-cradle style management device(s) for each shell lineset as a means to provide a permanent electrical connection for the lighting system circuits and controls to the battens.

- c) Any suspension system shall raise and lower the electrical cable as it travels with the batten.
  - d) The system shall allow the batten to move without disconnecting electrical cables, and without fouling any component of the hoisting mechanism.
- 2) Power and Control Distribution
  - a) Install gridiron junction boxes as supplied by theatre lighting contractor and as located on the drawings.
  - b) Hang all connector strips, cable raceways, plug boxes, and control interconnect boxes as supplied by theatre lighting contractor and as located on the drawings.
- h. Acceptable product(s)
  - 1) For utility and drapery sets:
    - a) ETC P75
    - b) Clancy Powerlift
  - 2) For shell and stage electric sets
    - a) ETC P75
    - b) Clancy Titan

## 2.8 HOIST CONTROL

- A. Provide a complete rigging control installation to include:
  - 1. The control system shall be specifically designed for use with the hoists installed with the system.
  - 2. All hoists shall be controlled from a single Rigging Control Panel (RCP).
- B. User Interface (RCP)
  - 1. The RCP shall be wall mounted as located on the drawings.
  - 2. Functions accessible from the RCP shall include:
    - a. "Go Up" and "Go Down" pushbuttons
    - b. A mushroom head "EMERGENCY STOP" button, utilizing a failsafe circuit hard wired to starters and drives.
    - c. An "ON/OFF" key operated switch shall be provided on the control unit to control power to the console, motor starters and drives. System shall not leave the motors and drives energized when not in use.
- C. System monitoring functions that shall also be reported to the operator
  - 1. Position control must be within a repeatable  $\frac{1}{8}$ " of the target
  - 2. The system shall monitor the load on each hoist and stop motion in the event of an overload or and under-load. Overload protection shall be in addition to any current monitoring in the motor drive.
  - 3. Dynamic feedback shall:
    - a. Provide the user with clear indication of which machines are selected.
    - b. Indicate when a machine is at a target or end of travel
- D. The System shall:
  - 1. Be compatible with supplemental remote emergency stop stations as described on the drawings.

2. Use industrial grade Programmable Logic Controller (PLC) and/or an industrial grade PC components and allow communication with motor sensors, controls, and drives over an industrial fieldbus supported by multiple manufacturers.
- E. Acceptable product(s)
1. JR Clancy Vantis with push-button operator remote
  2. ETC Quicktouch with Remote
  3. Or approved equal

## **2.9 FIXED BATTENS AND LIGHTING PIPES**

- A. Provide pipe assemblies attached to structure as described in the drawings.
- B. Assemblies shall be constructed of new ASTM A53/A 1-½" nominal schedule 40 plain end steel pipe.
- C. Pipe Grid Configuration
1. Cross-over Clamps
    - a. Intersecting pipes shall be joined with specialty hardware to clamp, join, and support pipe-grid segments. Clamps shall have a recommended working load of at least 1,500 lbs. U-bolts are not acceptable.
    - b. Acceptable product:
      - 1) JR Clancy Cross-Over Clamp
      - 2) Approved equal.
  2. Each pipe shall terminate just off the wall. Internally sleeved wall plates shall securely brace the grid against the wall once it is in place. Supply sufficient braces to prevent lateral movement of the pipe grid.
  3. Suspension
    - a. The grid shall be rigidly hung from the overhead steel structures on centers at nominal 6 ft. x 6 ft. intervals, and not exceeding 8 feet in either direction.  
Suspension methods shall be either:
      - 1) Pipe-hangers suitable to the intended load and SAE grade 5 threaded rod,  
or
      - 2) ¼-inch, 7x19 galvanized utility cable ending in 6 inches x 3/8 inch (152.4 mm x 9.5 mm) forged turnbuckles attached to pipe clamps.

## **2.10 STAGE DRAPERIES TRACKS**

- A. Straight Draw Curtain Tracks
1. Provide and install the curtain tracks as located and configured on the drawings.
  2. Track shall be constructed of 14 gauge galvanized steel, roll formed to a 2-5/8" W X 2-3/4" H channel with continuous slot in bottom. Provide un-spliced lengths up to 26' in length.
  3. Track must mount to pipe battens on maximum 5'-0" centers with two-piece hangers formed from 11 gauge steel.
  4. Provide a minimum of 2'-0" overlap in the center. Separate tracks at center with two overlap clamps.
  5. Install carrier stops with at each end of track.
  6. Provide single carriers, spaced 12" on center, constructed of (2) nylon-tired ball bearing wheels fastened parallel to carrier body. Supply carriers with heavy duty hook, swivel eye, and trim chain for attachment of drapes. Install neoprene bumper between each carrier to reduce noise.

7. Provide master carriers with 4-wheel nylon-tired ball bearing assemblies with bodies formed from 11 gauge steel. Connect to operating line with two formed steel cord clamps attached to each body. Supply each master carrier with two heavy duty hooks, swivel eyes, and trim chains for attachment of leading edge of drape.
8. Single and double end pulleys will clamp securely to the underside of the track channel and will be equipped with 6" diameter Nylatron GS sheaves grooved for up to ½" hand line. Install (2) ⅝" sealed precision ball bearings in each sheave. Lock shaft to side plate on head end with ⅜" keeper pin to prevent rotation and install fine threaded nylon insert lock nut.
9. Dead end pulley shall be mounted at 45 degrees from the traveler tracks to reduce clearance required for pulley between pipe battens.
10. Provide a sand bag tension pulley for operation of hand line of the mid-stage traveler. Provide adequate quantity of sand for proper hand line operation.
11. Hand line shall be ½" diameter, stretch resistant rope with spun polyester outer jacket double braided over solid polyester core.
12. Acceptable products:
  - a. H&H Specialties series 400
  - b. ADC series 280

**B. Walk-along Curtain Tracks**

1. Provide materials and the labor to install the curtain tracks as located and configured on the drawings.
2. Track shall be made of 6063-T5 aluminum, extruded into 2-½" I-beam with 1" wide top, intermediate and bottom flanges. Provide un-spliced lengths up to 24' in length.
3. Track must mount to pipe battens on maximum 5'-0" centers with two-piece hangers formed from 11 gauge steel hangers.
4. Provide single carriers, spaced 12" on center, constructed of (2) Delrin wheels fastened parallel to formed steel carrier body. Supply carriers with swivel hook for attachment of drapes. Install Nylatron wear strips at contact points to act as a bumper between each carrier to reduce friction. Provide neoprene bumpers between each carrier to reduce noise.
5. Provide walk along handles attached to the master carriers for operation of the curtain.
6. Provide end stops at each end of the track.
7. Ensure that all steel components are zinc plated for corrosion resistance.
8. Provide all track and associated hardware factory coated BLACK
9. Acceptable products:
  - a. H&H Specialties series 300
  - b. ADC series 140

## **PART 3 - EXECUTION**

### **3.1 GENERAL**

- A. Coordinate incorporation of the Work specified herein with other project work so as to facilitate a cohesive final product.
- B. Mount equipment and enclosures plumb and level.
- C. Permanently installed equipment to be firmly and safely held in place in accordance with specified safety factors and Federal and State codes and regulations.
- D. Work shall be completed within industry guidelines, including, Entertainment Services and Technology Association (ESTA), OSHA, National Electric Code, American National Standards



Institute, American Society for Testing and Materials, American Institute of Steel Construction, National Fire Protection Association, National Electrical Manufacturers Association, plus any or all local, governmental, or other applicable codes.

- E. Where dimensions and loading capacities have been omitted from this specification, they are to be determined by the Contractor, in accordance with the accepted industry standards and guidelines in this section. In no way will the theatre rigging contractor be relieved of primary responsibility to provide a safe, fully functional system.
- F. The mechanical fabrication and workmanship will incorporate the best practices for good fit and finish. There will not be any burrs or sharp edges to cause a hazard, nor will there be any sharp corners accessible to personnel.
- G. All equipment will be installed based on the manufacturer's recommendations and for the use intended by the manufacturer.
- H. All shop and field welding will meet the qualifications of the AISC manual and will be without spatter or other evidence of poor practices.
- I. All finishes which are disturbed during shipping and installation will be touched up to match the original.
- J. Materials will conform to the following ASTM standard specifications:
  - 1. A-36 structural steel
  - 2. A-36 steel plates and bars
  - 3. A-47 malleable iron casting
  - 4. A-48 gray iron casting
  - 5. A-53 welded and seamless steel pipe
  - 6. A-120 black and hot dipped zinc-coated steel pipe
- K. In order to establish minimum standards of safety, the following factors will be used:
  - 1. cables and fittings provide a minimum 8:1 design factor
  - 2. cable bending ratio is 30 times the cable diameter
  - 3. nuts and bolts use minimum SAE grade 5 (ASTM rating A-449)
  - 4. thread pressure of
    - a. 500 lb. for cast iron
    - b. 1000 lb. for steel
    - c. 1500 lb. for Nylatron
  - 5. steel designed to 1/5 of yield
  - 6. bearings are rated for two times the required load operating at full speed for 2000 hours.

### **3.2 INSTALLATION OF MOTORIZED RIGGING SYSTEM**

- A. All wire rope components will be installed so as to prevent abrasion or rubbing of the wire rope against any part of the building construction or other equipment.
- B. Pulleys and sheaves will be aligned as to provide a maximum fleet angle of 1.5 degrees. Mule blocks, cable rollers, guides, and sag bars will be installed as required to provide proper alignment.

### **3.3 INSTALLATION OF STAGE DRAPES AND TRACKS**

- A. Install all tracks and hardware according to manufacturer's recommendations.
- B. Stage draperies shall be installed near the end of the installation when chances of damage from other work are reduced. Stage area shall be broom clean with no further construction taking place prior to installation.
- C. After hanging stage draperies, thoroughly brush to remove dust, visible dirt, loose threads, loose fabric lint, etc. Wrinkles will be allowed to fall out naturally.

### **3.4 LABELING OF EQUIPMENT**

- A. Mark and label each batten with its set number, load/arbor capacity, stage centerline, and lift line locations with appropriate paint.
- B. Provide labels clearly indicating date of manufacture, cloth type, manufacturer's name and address, size (width and height using 3/4" minimum lettering), and Owner's designated inventory number (to be coordinated with Owner) will be sewn into the back (in most cases, upstage) side of the upper hem at both ends of each drape panel.

### **3.5 CONTRACTOR COMMISSIONING**

- A. Prior to energizing or testing the System ensure the following:
  - 1. Products are installed in proper and safe manner according to manufacturer's instructions.
  - 2. Dusts, debris, solder splatter, etc. is removed.
  - 3. Labeling has been provided.
  - 4. Temporary facilities and utilities have been properly disconnected, removed and disposed of off-site.
  - 5. Products are neat, clean and unmarred and parts securely attached.
  - 6. Broken work, including glass, raised flooring and supports, ceiling tiles and supports, walls, doors, etc. have been replaced or properly repaired, and debris cleaned up and discarded. Job site shall be left broom clean.
- B. Provide two portable VHF or UHF business band radios for use during acceptance testing with transmission range sufficient to cover entire project.
  - 1. Include rechargeable batteries and re-charger along with "holster" for wearing on belt.
  - 2. Radios to be available for duration of testing process, including any follow-up visits required prior to final acceptance.

**END OF SECTION 11 6133**

**SECTION 11 6143  
STAGE DRAPERIES**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. This specification describes the manufacture and installation of stage curtains in the Auditorium and Black Box.

**1.2 RELATED DOCUMENTS**

- A. Theatre Rigging Systems Drawings ("TR" Series) and general provisions of the contract including general and supplementary conditions and Division 1 Specification sections apply to this section.

**1.3 SECTION INCLUDES**

- A. Project instructions for the Contractor and System description details.
- B. System product descriptions.
- C. Project completion instructions for the Contractor.

**1.4 RESPONSIBILITY AND RELATED WORK**

- A. Coordination, supply, installation, shipping, storage, inspection, commissioning, testing, instruction and warranties of the Stage Draperies.
- B. Plant, materials, equipment, transport and labor necessary to accomplish this and have a complete and fully functioning System.
- C. Also includes:
  - 1. Required licenses and permits including payment of charges and fees.
  - 2. Verification of dimensions and conditions at the job site.
  - 3. Provision of submissions.
  - 4. Installation in accordance with the Contract Documents, Manufacturer's recommendation, and in conformity with applicable codes and authority having jurisdiction.
  - 5. Extension of electrical service, including ground, to equipment locations.
- D. The drawings included with this specification convey general system concepts. Where the plans do not show complete and accurate building details, the Contractor is responsible for making field measurements necessary to establish exact locations, relationships, and load capacities necessary for the installation of these systems.

- E. Coordinate the work with the related documents and the scheduled work of other trades.
- F. Supply accessories and minor equipment items needed for a complete and fully operational system, even if not specifically mentioned in these Specifications or on the associated Drawings, without claim for additional payment.
- G. Notify the Architect of any discrepancies in part numbers or quantities before bid. Failing to provide such notification requires the Contractor to supply items and quantities according to the intent of the Specifications and associated Drawings without claim for additional payment.
- H. Specifications and drawings are complementary. Work called for by one is binding as if called for by both. Any discrepancies between specifications and drawings shall be brought to the attention of the Architect for clarification during the bidding period. No allowance shall subsequently be made to the Contractor by reason of their failure to have brought said discrepancies to the attention of the Architect.
- I. Execute all work in accordance with all Standard Authorities listed above, and all applicable State and Local codes, ordinances, and regulations.
- J. If a conflict develops between the Contract Documents and the appropriate codes and is reported to the Architect prior to bid opening, the Architect will prepare the necessary clarification. Where a conflict is reported after contract award, propose a resolution of the conflict and, upon approval, perform work.
- K. Flame proofing and Documentation of Drapery Fabrics:
  - 1. Provide inherently flame retardant or chemically flame proofed draperies. Chemical flame proofing formula and process must adhere to Bureau of Standards U.S. Department of Commerce. Once fabric is processed, it will pass such tests as are required by the Fire Marshall of the local fire department, the Owner, and any other authority having jurisdiction.
  - 2. A certificate for each drape is required to be provided to the Owner. This certificate clearly indicates: the name of the Stage Drapery (sub) Supplier, the name and color of the fabric, the name of the Company providing flame proofing treatment, date of the treatment, the date of re-treatment required, the name of the chemical and method used, the signature of an officer or approved representative of the Company providing flame proofing treatment, and the signature of an officer of the company installing the draperies. Official seal(s) and signature(s) of a notary public is required for the both signatures.
  - 3. Labels clearly indicating date of manufacture, cloth type, manufacturer's name and address, size (width and height using 3/4" minimum lettering), and Owner's designated inventory number (to be coordinated with Owner) will be sewn into the back (in most cases, upstage) side of the upper hem at both ends of each drape panel.

## 1.5 REFERENCES

- A. Published specification standards, tests or recommended methods of trade, industry or governmental organizations apply to Work in this section where cited below:
  - 1. National Fire Protection Association (NFPA)
  - 2. American National Standards Institute (ANSI)

3. American Society of Testing and Materials (ASTM)
4. Occupational Safety and Health Administration (OSHA)
5. Underwriters Laboratories (UL)
6. Entertainment Services and Technology Association (ESTA)
7. Entertainment Technicians Certification Program (ETCP)

## **1.6 DESCRIPTIONS AND REQUIREMENTS**

### **A. Auditorium**

- 1) Stage
  - a) Drapery for the stage platform shall consist of a main curtain, masking legs and borders, a mid-stage act curtain, an upstage blackout curtain, a cyclorama, and side masking tabs as described on the drawings.
  - b) Drapery and associated hardware shall mount on lineset battens as scheduled.
    - (1) The main curtain, downstage traveler, mid-stage traveler, and blackout curtain, each consisting of two (2) matched fabric panels, will part at their centers and draw open on a traveler track. The main curtain shall fully clear the proscenium when opened.
    - (2) The side tabs shall be track mounted; operation will be by hand using walk-along track hardware.
    - (3) Masking legs will hang from walk-along track carriers as indicated in drawings. One (1) spare set shall have ties to tie directly to a utility batten.
    - (4) Borders/ Valance and the cyclorama will tie directly to lineset battens.
  - c) Storage hampers shall be provided for storage of spare drapery.

### **B. Black Box**

- 1) Drapery for the Black Box shall consist of:
  - a) A series of black masking legs suspended from walk-along tracks beneath the pipe-grid system as scheduled and located on the drawings.

### **C. Accessories**

- 1) Provide wheeled hampers with lids for storage of spare/loose curtains.

### **D. General Requirements**

- 1) It is the responsibility of the stage curtain provider to ensure the proper size and fit of the drapery within the facility.
- 2) All drapery shall be sized and verified based on field measurements prior to fabrication.

## **1.7 QUALITY ASSURANCE**

### **A. Contractor's Qualifications: Firm experienced in the provision of systems similar in complexity to those required for this project; and meet the following:**

1. No less than five (5) years of experience with equipment and systems of the specified types.
2. Experience with at least five (5) comparable scale projects within the last two (2) years.
3. Employ only fully trained stage riggers and mechanics for the erection of the stage equipment.
4. An ETCP certified theatre rigger shall supervise all rigging installation.

5. The stage riggers will be completely familiar with the type of equipment to be installed. A competent and knowledgeable Job Superintendent will be on the job at all times when Work is in progress.
6. Maintain a fully staffed and equipped service facility.
7. At the request of the Architect, demonstrate that:
  - a. Adequate plant and equipment is available to complete the work.
  - b. Adequate staff with commensurate technical experience is available.

## **1.8 SUBMITTALS:**

- A. Provide submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures section unless otherwise indicated.
- B. The submittal information required by the specification is to be presented complete and as submissions noted below. Submittals are a crucial and integral part of the construction process; as such the Owner's consultant will not recommend payment to the Contractor above 25% of the scheduled value of this work until all submittal information has been approved.
- C. Submittals must be original work produced by the firm responsible for performing the work defined in this specification. Scanning, photographic copying, materially copying, or any other reproducing the contents of the drawings or specifications contained within the Contract Documents will be marked as unacceptable and not reviewed for any content. No claim shall be made for delay, undue burden, or additional costs for the effort to produce shop drawings, schedules, and equipment lists addressing this specification or the overall project manual.
- D. Project Submittal Part 1:
  1. Provide for approval not later than thirty (30) days after issuance of Notice to Proceed and prior to commencement of Work:
    - a. Section 1: A complete schedule of submittals.
    - b. Section 2: A chronological schedule of Work in bar chart form. Revise and resubmit schedule as required to reflect construction progress.
- E. Project Submittal Part 2
  1. Provide for approval no later than sixty (60) days after issuance of Notice to Proceed and in accordance with previously provided submittal schedule.
  2. Products:
    - a. Section 1: Complete list of products to be incorporated within the Work (Bill of Materials).
    - b. Section 2: Manufacturer's data sheets for each product.
      - 1) Provide original Manufacturer's data sheets in order as they appear in this specification.
      - 2) Data sheets are required for each product in sufficient detail to evaluate product suitability for incorporation within the Work.
      - 3) Product literature shall include documentation of UL listing or approved recognition by a Nationally Recognized Testing Laboratory (NRTL).
    - c. Section 3: Fabric Samples
      - 1) Submit a sample book of each fabric specified, containing manufacturer's standard colors available in the quality of fabric specified for the Owner's selection and approval of color. More than one color may be selected. After

selection, upon request, submit one square foot sample of each fabric in each color for final review.

- d. Section 4: Submit Safety Data Sheets (SDS) for each potentially hazardous material prior to use. Include information pertaining to the hazardous material with the SDS.
  3. Drawings:
    - a. Provide computer software generated drawings using standard industry graphic standards. Hand or poorly drawn documents will not be accepted. All drawings shall be created on a computer aided drafting (CAD) system. Electronic files of theatrical lighting contract documents shall not be distributed for use in generating submittal documents with the exception of Architectural backgrounds.
    - b. Equipment Drawings:
      - 1) Provide complete assembly details of drapes including stitching schematics, weights, attachment details, and fabric/drape schedule.
    - c. Installation Drawings.
      - 1) Provide detail drawings depicting any unique installation methods specific to each product.
  4. Any other pertinent data generated which is necessary to provide the Work.
- F. Submittal Format:
1. Electronic (PDF) submittal documents are required for review.
  2. Provide each submittal with a unique number and each shall be numbered in consecutive order.
  3. Submittals shall not be issued with other disciplines.
  4. Provide each submittal with a complete table of contents with the following information:
    - a. Project Name
    - b. Submittal number. In the case of a resubmittal, use the original submittal number immediately followed by the suffix "R" immediately followed by a unique number and shall be numbered in consecutive order.
    - c. Date of submission.
    - d. Referenced specification Section, Part, Article, Paragraph, and page number or drawing reference as applicable.
  5. Follow list by Manufacturer's data sheets, arranged as in Part 2 of this specification. If a data sheet shows more than one product, indicate the model being proposed with an arrow or other appropriate symbol.
  6. Drawings executed at an appropriate scale, but not smaller than  $1/8" = 1'-0"$  for conduit/floor plans,  $1/4" = 1'-0"$  for equipment layouts, and  $1/2" = 1'-0"$  for mounting details and panel details.
- G. Resubmission Requirements:
1. Make any requested corrections or change in submittals required. Resubmit for review as directed.
  2. Indicate any changes that have been made other than those requested.
- H. Approval of Submittals: Each submittal package will be returned with one of the following stamps:
1. "No Exceptions Taken" proceed with construction; all job site coordination will be at the direction of the General Contractor.
  2. "Make Corrections Noted: No Resubmission Required" submittals have been returned with conditional approval. Corrections, as indicated on the returned drawings and/or specifications, must be made before construction can begin.
  3. "Make Corrections Noted: Submit Only Corrected Pages/Items" submittals have been returned with conditional approval. Corrections, as indicated on the returned drawings

and/or specifications, must be made in writing and returned to the consultant before construction can begin.

4. "REJECTED, Submit Specified Item" a specified item in the submittal has been rejected for the reasons noted. Re-submit in compliance with the specifications.
5. "REJECTED, Revise and Re-submit" submittal has been rejected for the reasons noted. Re-submit in compliance with the specifications.
6. "No Review Action Required" all information provided was for information or coordination purposes only. Review is not required.

## **1.9 PROJECT RECORD MANUAL**

- A. Provide electronic copies of the project record documents or as required per the General Conditions of the Project.
- B. The Project Record Manual shall be segregated into three separate bindings as follows:
  1. As-Built Record Documents:
    - a. Product Data:
      - 1) List of all products incorporated in the Project inclusive of all substitutions, field changes, or revisions The list shall include Manufacturer's serial numbers.
      - 2) Manufacturer's data for each type of product conforming to the scheme above.
      - 3) Organize and bind the above in specification order.
    - b. Record drawings: Final rendition of project drawings enumerated in the Submittal section above. Provide editable computer software generated drawings using standard industry graphic standards. Hand or poorly drawn documents will not be accepted. All drawings shall be created on a computer aided drafting (CAD) system, in both a DWG and PDF file format.
    - c. Test Reports: Record findings of systems testing described in Part 3 below.
  2. Operations Manual
    - a. System Operation and Instructions: Prepare a complete and typical procedure for the operation of the equipment as a system, organized by subsystem or activity.
      - 1) This procedure should describe the operation of all system capabilities.
      - 2) Assume the intended reader of the manual to be technically experienced but unfamiliar with the components and the facility.
  3. Service & Maintenance Manual:
    - a. Provide an original copy of the service manual on every piece of equipment for which the Manufacturer offers a service manual. Arrange manuals in the same order as the operations manual.
    - b. Manufacturer's maintenance and care instructions.
    - c. Maintenance Instructions: include maintenance phone number(s) and hours, maintenance schedule, description of products recommended or provided for maintenance purposes, and instructions for the proper use of these products.
  4. Warranty Manual:
    - a. Manufacturer's warranty statements on each product.
    - b. Date of substantial completion and ending dates for warranties for each group of products.
    - c. Software registration and licenses.
  5. Drapery Flame proofing Documentation:
    - a. Provide all certificates, test reports, and documentation required for drapery flame proofing.
  6. Include any other pertinent data generated during the Project or required for future service.



7. Appropriately duplicate data within the separate bindings when it will reasonably clarify procedures, e.g., operational data in maintenance binding.

#### **1.10 DELIVERY, STORAGE, AND HANDLING**

- A. Products shall ship and be stored in their original container to prevent damaging or entrance of foreign matter until installation.
- B. Provide protective covering during construction to prevent damaging or entrance of foreign matter.
- C. Replace, at no expense to the Owner, product damaged during storage, handling, or the course of construction.

#### **1.11 PROJECT CONDITIONS**

- A. Verify conditions on the job site applicable to this work. Notify Architect in writing of discrepancies, conflicts, or omissions promptly upon discovery.
- B. The Drawings diagrammatically show arrangements of equipment fitting the space available without interference. If conditions exist which make it impossible to install work as shown, recommend solutions and/or submit drawings to the Architect for approval, showing how the work may be installed.

#### **1.12 FINAL TESTING AND OBSERVATION**

- A. Upon completion of installation and initial tests and adjustments, described in Part 3, acceptance testing shall be performed by the Consultant.
- B. The process of acceptance testing the System may necessitate moving and adjusting certain component parts, such as counterweights on arbors, adjustment of drapery tracks, etc. Perform such adjustments without claim for additional payment.

#### **1.13 WARRANTY**

- A. Warrant labor and product for two (2) years following the date of substantial completion to be free of defects and deficiencies and to conform to the drawings and specifications as to kind, quality, function, and characteristics. Repair or replace defects occurring in labor or product within the Warranty period without charge. Any cost associated with this warranty repair is the responsibility of the Contractor.
- B. This warranty is in addition to any specific warranties issued by Manufacturers for greater periods of time.
- C. Within the warranty period, answer service calls within twenty-four (24) hours during normal working hours and correct the deficiency within forty-eight (48) hours.

## **PART 2 - PRODUCTS**

### **2.1 ACCEPTABLE MANUFACTURES**

- A. Model numbers and manufacturers included in this specification are listed to establish a standard of function, performance, and quality.
- B. Refer to General and Supplementary Conditions and Division 1 Specification Sections for equipment substitution procedure.
- C. Providing product not specifically specified without prior written approval by the Owner, Architect and/or Architect's Consultant shall not be accepted.

### **2.2 GENERAL**

- A. Products shall be new, free from defects and listed by an NRTL when an applicable NRTL Standard exists. Provide product of a given type from one manufacturer.
- B. Regardless of the length or completeness of the descriptions below, provide product that meets or exceeds the specified product's published functionality.

### **2.3 CONTACTS**

- A. Listed below is contact information for Manufacturers of rigging components approved to provide equipment on this project:
  - 1. K&M Fabrics
    - a. 2 Waco Street, Greenville, South Carolina 29611
    - b. Telephone: (800) 845-1896
    - c. Approved to supply curtain fabric.
  - 2. J.B. Martin
    - a. 445 rue St-Jean-sur-Richelieu, Quebec, Canada J3B 2M1
    - b. Telephone: (514) 346-6853
    - c. Approved to supply curtain fabric
  - 3. Rose Brand Fabrics
    - a. 4 Emerson Lane, Secaucus, NJ 07094
    - b. Telephone: (800) 223-1624
    - c. Approved to supply drapery, hampers, and miscellaneous associated equipment.
  - 4. Liba Fabrics Corp.
    - a. 132 W 36<sup>th</sup> St. 6<sup>th</sup> Floor, New York, NY 10018
    - b. Telephone: (212) 563-4991
    - c. Approved to supply curtain fabrics

### **2.4 STAGE DRAPERY**

- A. General Specification for Stage Drapery
  - 1. Provide and install all curtains as located and scheduled on the drawings.
  - 2. Field verify all dimensions prior to fabrication of draperies.

3. Curtain fabric of professional grade fabric intended for stage use. If not inherently flame retardant, curtain fabric shall be chemically flame proofed at the mill using an immersion process. Flame proofing certificates for all fabrics used shall be furnished to the owner with the as-built drawings.
4. Sew tags identifying manufacturer and size of panel at each end of webbing at top and at one corner at hem in each drape.
5. Curtains must be constructed with vertical seams unless otherwise specified. The fabric grain shall run nap down and match in all panels. All panels must be un-spliced along their height.
6. Construction
  - a. Black Poly webbing at 4" wide shall be double stitched to the top of the curtain with 1" of face fabric turned under the webbing.
  - b. Brass rustproof grommets shall be inserted
    - 1) at the extreme top corners
    - 2) in the pleat centers of curtains sewn with fullness, or
    - 3) on 12" centers for flat curtains.
  - c. Grommet holes for track mounted curtains shall be supplied with
    - 1) plated wire "S" hooks, or
    - 2) snap hooks, sewn-in at the spacing noted above.
  - d. Drapery hung directly from an auxiliary batten shall have a 24" long black cotton tie line fastened in each grommet hole.
  - e. The centerline of the drape shall be marked on the top webbing with "CL" and a white tie line added to the corresponding grommet.
  - f. Curtains sewn with fullness shall have box pleats spaced 12" on center.
  - g. Bottom hems shall be 4" wide. These shall be sewn with a separate canvas chain pocket inside so that the bottom of the canvas pocket rides 2 inches above bottom of the hem. Provide #8 plated jack chain in the pocket.
  - h. All traveling curtains shall be sewn with a minimum 24" of face fabric turned back at the leading edge. All other vertical hems shall be 2".
7. Use mercerized cotton thread, minimum weight of #16, color to match drape fabric.
8. Fabric colors shall be as scheduled. Submit color sample card with submittal documents. Make all effort to ensure that curtains of the same color are fabricated from fabrics of the same dye lot.
9. Labeling
  - a. Sew labels onto the back (in most cases, upstage) side of the upper hem at both ends of each panel.
  - b. Labels shall clearly indicate
    - 1) date of manufacture
    - 2) cloth type
    - 3) manufacturer's name and address
    - 4) size (width and height using 3/4" minimum lettering
    - 5) owner's designated inventory number
10. Acceptable product:
  - a. For nominal 24-25 ounce fabric
    - 1) KM Fabrics Charisma inherently flameproof velour.
  - b. For nominal 20-21 ounce fabric
    - 1) KM Fabrics Crescent inherently flameproof velour
  - c. For cyclorama
    - 1) Rose Brand Heavy-Weight Seamless Muslin

## 2.5 MISCELLANEOUS

- A. Cloth Hampers:

- 1) Provide two (2) castered cloth hampers for storage and transport of loose draperies.
- 2) Hampers shall be made from heavyweight canvas with hinged wooden tops, reinforced bottoms and 4" heavy duty swivel casters.
- 3) Provide hamper tops with caster donuts to allow stacking of hampers.
- 4) Acceptable Product:
  - a) Rose Brand 20 Bushel Hamper

## **2.6 COMPLETED SYSTEM**

### **A. General**

1. All installation of stage rigging equipment shall be completed utilizing new materials, free from flaws and rust, and in good working order. The jobsite shall be cleaned of all packing materials, lubricants, metal shaving, miscellaneous hardware, and components not used in the installation.
2. All dimensions are to be field verified. Location and attachment of hardware and size of components shall be confirmed by the Contractor.
3. All electrical power, outlets, related systems, and structural elements required to make the system fully functional re the responsibility of the Contractor.
4. If components and hardware are not specifically specified or called out, it is the responsibility of the Contractor to provide those components in order to provide a fully operational theatrical rigging system.

### **B. Trimming/Leveling of Drapery**

1. Contractor is to return to the jobsite within sixty (60) days, but not less than thirty (30) days of the installation to re-trim all tracks and curtains.
2. Provide documented notes on site visit to Architect and Architect's Consultants on adjustments made during return visit.

## **PART 3 - EXECUTION**

### **3.1 GENERAL**

- A. Coordinate incorporation of the Work specified herein with other project work so as to facilitate a cohesive final product.
- B. Mount equipment and enclosures plumb and level.
- C. Permanently installed equipment to be firmly and safely held in place in accordance with specified safety factors and Federal and State codes and regulations.
- D. Work should be completed within industry guidelines, including ESTA, OSHA, ANSI, ASTM, NFPA, plus any or all local, governmental, or other applicable codes.
- E. Where dimensions and loading capacities have been omitted from this specification, they are to be determined by the Contractor, in accordance with the accepted industry standards and guidelines in this section. In no way will the Contractor be relieved of primary responsibility to provide a safe, fully functional system.

- F. The mechanical fabrication and workmanship will incorporate the best practices for good fit and finish. There will not be any burrs or sharp edges to cause a hazard nor will there be any sharp corners accessible to personnel.
- G. All equipment will be installed based on the manufacturer's recommendations and for the use intended by the manufacturer.
- H. All finishes which are disturbed during shipping and installation will be touched up to match the original.

### **3.2 INSTALLATION OF STAGE DRAPERIES AND TRACK HARDWARE**

- A. Install all track mounted draperies to hardware according to track manufacturer's recommendations.
- B. Stage draperies shall be installed near the end of the installation when chances of damage from other work are reduced. Stage area shall be broom clean with no further construction taking place prior to installation.
- C. After hanging stage draperies, thoroughly brush to remove dust, visible dirt, loose threads, loose fabric lint, etc. Wrinkles will be allowed to fall out naturally.
- D. Verify that each drapery panel bears a label as described in paragraph 2.4., A, 9 above.

### **3.3 FINAL OBSERVATION & TESTING**

- A. Upon completion of installation, initial adjustments, tests and measurements specified in Part 3, and submission and review of the results, a final inspection and test will be observed by the Consultant.
- B. Contractor will assist in this testing and provide all test equipment noted below.
  - 1. Contractor shall provide at least one (1) person for inspection and two (2) persons for testing familiar with aspects of the System to assist the Consultant.
  - 2. Contractor personnel shall be made available for the entire testing period (day and night), to assist in tests, adjustments, and final modifications.
  - 3. Testing process is estimated to take a minimum of one (1) day.
- C. Testing will include operation of each major system and any other components deemed necessary.
- D. The following procedures will be performed on each System:
  - 1. Inspection of the means and methods employed to incorporate the System within the facility.
  - 2. Verification of proper operation, from controlling devices to controlled devices.

3. Verification of proper adjustment, balance, and alignment of equipment for optimum quality and to meet the Manufacturer's published specifications. Establish and mark normal settings for each setting, and appropriately record these settings within the Record Documents.
  4. Other tests on equipment or systems deemed appropriate.
- E. The Consultant will provide the Owner with a listing describing any incomplete or otherwise deficient items determined as part of the testing process. Where further adjustment or work becomes evident during testing, the Contractor is to continue work until the System is complete.
- F. Stage drapery installer shall return to the jobsite six months after acceptance to:
1. Inspect curtains and attachments
  2. Re-trim all curtains.

### **3.4 INSTRUCTION OF OWNER PERSONNEL**

- A. Provide operations and service training on all equipment incorporated in the System.
- B. Training shall not be conducted until final observation and testing is completed by the Consultant, unless otherwise directed by the Owner.
- C. Provide (2) hour of training. Training shall be conducted in accordance with Owner's schedule.
- D. In the event that a portion of the training time is occupied in troubleshooting the equipment installation, then the training time shall be extended an equal amount of time.
- E. Submit an outline of the course with sample instructional aides for approval thirty (30) days prior to scheduled instruction sessions to architect and architect's consultant.
- F. Following discussions with Owner, provide a Training submittal 2-4 weeks prior to first training. Submittal shall:
1. Indicate date, time, and approximate length of training session.
  2. Indicate person(s) conducting training.
  3. Indicate whether training will be video recorded.
  4. Intended curriculum and most appropriate attendees (e.g., technician, operations, IT, etc.)
  5. Include signature and title lines for:
    - a. Owner acknowledging and accepting training schedule. Include both an Accepted and Rejected box. An alternate schedule time should be suggested by the Owner in the event the schedule is rejected.
    - b. Countersigning by trainer indicating that training actually occurred.
    - c. All persons attending training. Where attendees do not stay for the entire session, this should be noted on the form and initialed by Owner's representative attending training.
    - d. Owner's representative attending training at the end of the session shall initial that:
      - 1) Training Occurred.
      - 2) Training Materials were provided and left with Owner

- 3) Training was not interrupted or shortened by equipment or system troubleshooting. If it is, then there should be a line where Owner and Contractor can indicate when make-up training will be provided and how long it should be.
  - 4) Training was generally sufficient for the proposed curriculum.
- 6. Include Notes section for Owner and Contractor to note any issues during training (areas requiring further development, etc.)
- G. If a representative of the Manufacturer is used in the instructional course, the Contract must be present throughout the extent of the course and ensure that the representative abides by the requirements set forth in these specifications.
- H. Following training occurrence, submit completed training records no later than 5 days following end of training.

**END OF SECTION 11 6143**





## **SECTION 11 6162**

### **THEATRICAL LIGHTING SYSTEMS**

#### **PART 1 - GENERAL**

##### **1.01 SUMMARY**

- A. Provision of the Theatrical Lighting Systems at the Auditorium and Black Box.

##### **1.02 RELATED DOCUMENTS**

- A. Theatre Lighting Systems Drawings ("TL" Series) and general provisions of the contract including general and supplementary conditions and Division 1 Specification sections apply to this section.
- B. Section 11 6133: Theatrical Rigging Systems, drawings, and documentation.
- C. Section 27 4116: Audio Video Systems and Equipment, drawings, and documentation.
- D. Division 26: Electrical Work drawings and documentation.

##### **1.03 SECTION INCLUDES**

- A. Project instructions for the Contractor and System description details.
- B. System product descriptions.
- C. Project completion instructions for the Contractor.

##### **1.04 RESPONSIBILITY AND RELATED WORK**

- A. Coordination, supply, installation, shipping, storage, inspection, commissioning, testing, instruction and warranties of the Theatrical Lighting Systems.
- B. Plant, materials, equipment, transport and labor necessary to accomplish this and have a complete and fully functioning System.
- C. Also includes:
  - 1. Required licenses and permits including payment of charges and fees.
  - 2. Verification of dimensions and conditions at the job site.
  - 3. Provision of submissions.
  - 4. Installation in accordance with the Contract Documents, Manufacturer's recommendation, and in conformity with applicable codes and authority having jurisdiction.
  - 5. Extension of electrical service, including ground, to equipment locations.
- D. The drawings included with this specification convey general system concepts. Where the plans do not show complete and accurate building details, the Contractor is responsible for making field measurements necessary to establish exact locations, relationships, and load capacities necessary for the installation of these systems.
- E. Coordinate the work with the related documents and the scheduled work of other trades.
- F. Conduit infrastructure system, including wire for AC Power and grounding for the Theatrical Lighting Systems, are provided as part of the Contract. Coordination between different disciplines is required to achieve a proper conduit system installation and power provisions for Theatrical Lighting Systems. All electrical installation shall be in accordance with Division 26.

- G. Supply accessories and minor equipment items needed for a complete and fully operational system, even if not specifically mentioned in these Specifications or on the associated Drawings, without claim for additional payment.
- H. Notify the Architect of any discrepancies in part numbers or quantities before bid. Failing to provide such notification requires the Contractor to supply items and quantities according to the intent of the Specifications and associated Drawings without claim for additional payment.
- I. Specifications and drawings are complementary. Work called for by one is binding as if called for by both. Any discrepancies between specifications and drawings shall be brought to the attention of the Architect for clarification during the bidding period. No allowance shall subsequently be made to the Contractor by reason of their failure to have brought said discrepancies to the attention of the Architect.
- J. Execute all work in accordance with the NEC and all applicable State and Local codes, ordinances, and regulations.
- K. If a conflict develops between the Contract Documents and the appropriate codes and is reported to the Architect prior to bid opening, the Architect will prepare the necessary clarification. Where a conflict is reported after contract award, propose a resolution of the conflict and, upon approval, perform work.

#### **1.05 REFERENCES**

- A. Published specification standards, tests or recommended methods of trade, industry or governmental organizations apply to Work in this section where cited below:
  - 1. American National Standards Institute (ANSI)
  - 2. American Society of Testing and Materials (ASTM)
  - 3. Electronics Industries Association (EIA)
  - 4. Institute of Electrical and Electronic Engineers (IEEE)
  - 5. National Electrical Manufacturer's Association (NEMA)
  - 6. National Electrical Code (NEC)
  - 7. National Fire Protection Association (NFPA)
  - 8. Underwriters Laboratories (UL)
  - 9. Occupational Safety and Health Administration (OSHA)
  - 10. Entertainment Services and Technology Association (ESTA)
  - 11. United States Institute of Theater Technology (USITT)
  - 12. Illuminating Engineering Society (IES)

#### **1.06 DEFINITIONS**

- A. In addition to Division 1 definitions, the following list of terms as used in this Section shall be defined as:
  - 1. Owner – Tomball ISD
  - 2. Project – Tomball High School #3
  - 3. Consultant(s) – The Owner's Technical Representative(s) for this Section
  - 4. Architect – Huckabee
  - 5. Contractor – The provider of all material, labor, and equipment necessary for the systems described in this Section
  - 6. Furnish/Supply – To purchase, procure, acquire, and deliver complete with all necessary accessories

7. Install – To set in place, join, attach, link, set up or otherwise connect together and test until complete before turning over to the Owner, all parts, item, or equipment supplied by the Contractor.
8. Provide – To furnish and install.

## **1.07 DESCRIPTIONS AND REQUIREMENTS**

### **A. Lighting and Control System: Auditorium Stage**

1. The lighting system shall be comprised of a dedicated network-based control system communicating with the distributed power system and DMX devices (including architectural fixtures) to control all lighting elements within the facility. This centrally controlled system shall be divided into performance (theatrical, concert, lecture,) house architectural and work/running lighting subsystems.
2. The lighting control console may be located variously within the Theatre or at the Stage. Console shall operate directly over the network but shall have a DMX wired connection for use with possible non-network capable controllers.
3. Motorized breaker panels and the control distribution rack (CDR) shall be located in the designated equipment room. One control distribution rack will contain all network and network DMX interface control components for the Auditorium and Black Box.
4. Remotely switched power shall be distributed throughout the theatre in flush wall-mounted and batten-mounted devices.
5. Network control shall be distributed throughout the theatre through a series of plug in ports for use with portable network node equipment and fixed network DMX nodes.
6. Architectural Lighting system shall be capable of supporting the same DMX values as the control console so that looks may be snapshotted then recalled through architectural station presets. This will include control of dimmed and switched performance lighting circuits, dimmed and switched architectural fixtures, switched room work-lighting, and switched performance blue backstage pathway fixtures.
7. Architectural lighting control stations shall be located throughout the spaces in areas where architectural, work and running lights will be accessed. Stations shall range from master touch screen, to pushbutton preset recall stations to on/off switches. The system shall have the ability to “lock-out” stations in order to avoid nuisance switching during performance.
8. Work lighting will consist of permanently installed fixtures and circuits within theatrical distribution boxes for portable work lights that may be mounted as production requirements dictate. Work lighting shall be accessed through both the Architectural and Theatrical controllers.
9. Portable DMX operated dimmer modules shall allow operation of conventional tungsten theatrical lighting fixtures and incandescent “practicals.”

### **B. Architectural Lighting Controls Integration: Auditorium Stage**

1. Contractor shall be responsible for installation and termination of DMX and/or 0-10V to all architectural house light, work light, and other permanently installed fixtures intended for control by the system.
2. Any required DMX and/or 0-10V controlled interface shall be provided by the Contractor including equipment parts, labor, and installation of equipment.
3. It is the contractor’s responsibility to verify fixture operation before fixtures are permanently installed overhead and/or at locations with limited accessibility.

4. Configuration – Configure architectural control system screens in conjunction with Owner and Consultant as part of the system commissioning. Base configuration shall accommodate the following basic layouts:
  - a. Main Navigation
  - b. User configurable named presets (2 pages to be programmed at training)
  - c. House light individual control
  - d. House light presets
  - e. Work light individual control
  - f. Work light presets
  - g. Blue light individual control
  - h. Blue light presets
  - i. Aisle and pathway fixture control
- C. Lighting and Control System: Black Box
  1. The Black Box theatrical lighting system shall be comprised of a dedicated network-based control system communicating with the distributed power system and DMX devices to control all lighting elements within the facility.
  2. The lighting control console may be located variously within the Black Box. Console shall operate directly over the network.
  3. Motorized breaker panel (MBP) shall be located in the designated equipment room. All network and DMX interface control components for the Black Box shall be located in the Auditorium control distribution rack (CDR).
  4. Remotely switched power shall be distributed throughout the theatre in flush wall-mounted and batten-mounted devices.
  5. Network control shall be distributed throughout the Black Box through a series of plug in ports for use with portable network node equipment and fixed network DMX nodes.
  6. Architectural Lighting system shall be capable of supporting the same DMX values as the control console so that looks may be snapshotted then recalled through architectural station presets. This will include control of switched performance lighting circuits, dimmed and switched architectural fixtures.
  7. Architectural lighting control stations shall be located throughout the spaces in areas where architectural, work, and running lights will be accessed. Stations shall range from master touch screen, to pushbutton preset recall stations, to on/off switches. The system shall have the ability to “lock-out” stations in order to avoid nuisance switching during performance.
- D. Portable Lighting Fixtures and Accessories
  1. Provide theatrical lighting fixtures and required accessories. Installation is required under this base specification and shall include:
    - a. Hang and rough focus to the Owner’s selected hanging plot.
    - b. Set-up, addressing and patch.
    - c. Verification of proper operation and associated training.

#### **1.08 QUALITY ASSURANCE**

- A. Contractor’s Qualifications: Firm experienced in the provision of systems similar in complexity to those required for this project; and meet the following:
  1. No less than five (5) years of experience with equipment and systems of the specified types.

2. Experience with at least five (5) comparable scale projects within the last two (2) years.
  3. Engage the services of a Manufacturer certified technician.
  4. Maintain a fully staffed and equipped service facility.
  5. At the request of the Architect, demonstrate that:
    - a. Adequate plant and equipment is available to complete the work.
    - b. Adequate staff with commensurate technical experience is available.
- B. Manufacturer's Qualifications:
1. No less than five (5) years continuous experience in the production of specified type of product.
  2. Production shall meet applicable NEMA standards.

#### **1.09 SUBMITTALS:**

- A. Provide submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures section unless otherwise indicated.
- B. The submittal information required by the specification is to be presented complete and as submissions noted below. Submittals are a crucial and integral part of the construction process; as such the Owner's consultant will not recommend payment to the Contractor above 25% of the scheduled value of this work until all submittal information has been approved.
- C. Submittals must be original work produced by the firm responsible for performing the work defined in this specification. Scanning, photographic copying, materially copying, or any other reproducing the contents of the drawings or specifications contained within the Contract Documents will be marked as unacceptable and not reviewed for any content. No claim shall be made for delay, undue burden, or additional costs for the effort to produce shop drawings, schedules, and equipment lists addressing this specification or the overall project manual.
- D. Project Submittal Part 1:
1. Provide for approval not later than thirty (30) days after issuance of Notice to Proceed and prior to commencement of Work:
    - a. Section 1: A complete schedule of submittals.
    - b. Section 2: A chronological schedule of Work in bar chart form. Revise and resubmit schedule as required to reflect construction progress.
- E. Project Submittal Part 2
1. Provide for approval no later than sixty (60) days after issuance of Notice to Proceed and in accordance with previously provided submittal schedule.
  2. Products:
    - a. Section 1: Complete list of products to be incorporated within the Work (Bill of Materials).
    - b. Section 2: Manufacturer's data sheets for each product.
      - 1) Provide original Manufacturer's data sheets in order as they appear in this specification.
      - 2) Data sheets are required for each product in sufficient detail to evaluate product suitability for incorporation within the Work.
      - 3) Product literature shall include documentation of UL listing or approved recognition by a Nationally Recognized Testing Laboratory (NRTL).
    - c. Section 3: Provide Architect and/or Architect's Consultant with samples of wall plate materials and colors as specified in this section.

- d. Section 4: Submit Safety Data Sheets (SDS) for each potentially hazardous material prior to use. Include information pertaining to the hazardous material with the SDS.
- 3. Drawings:
  - a. Provide computer software generated drawings using standard industry graphic standards. Hand or poorly drawn documents will not be accepted. All drawings shall be created on a computer aided drafting (CAD) system. Electronic files of theatrical lighting contract documents shall not be distributed for use in generating submittal documents with the exception of Architectural backgrounds.
  - b. Schematic Drawings.
    - 1) Provide drawings detailing cabling-riser intent.
    - 2) Give each component a unique designator and use this designator consistently throughout the project.
    - 3) Include inter- and intra-component connections and cabling diagram depicting cable types, designators, and color codes.
  - c. Installation Drawings.
    - 1) Provide drawings showing the coordinated locations of all installed equipment. Drawings shall include floorplans and other views as necessary to fully describe the intended finished conditions.
    - 2) Provide Conduit and Electrical Drawings indicating:
      - a) Conduit sizing/routing for each system component,
      - b) Locations where power is required along with the location of all junction boxes.
    - 3) Detail Drawings: Provide drawings showing special details depicting methods and means specific to each product, assembly and each product Manufacturer's recommended installation methods and means.
  - d. Equipment Drawings:
    - 1) Rack and Panel Elevations: Provide a front elevation of all racks and/or panels.
    - 2) Rack and Panel Assembly Details: Provide drawings showing location of equipment in racks with dimensions; wire routing and cabling within housings; AC power outlet and terminal strip locations.
    - 3) Custom Enclosures and Millwork Drawings: Provide full fabrication detail drawings indicating size, material, finish, and openings for equipment.
    - 4) Fabricated Plates and Panels Drawings: Provide complete drawings of custom fabricated plates or panels. Drawings to include dimensioned locations of components, component types, engraving information, plate material and color, and bill of material.
  - e. Schedule Drawings: Provide load schedules noting source and destination of wiring and associated connected load.
  - f. Labeling Drawing: Provide representative equipment and cabling labeling scheme. Include font sizes and styles, explanation of scheme, and descriptor and designator schedule.
  - g. General Detail Drawings: Provide detail drawings depicting any unique installation methods specific to each product.
  - h. Control Screen Templates: Provide layout drawings and/or screenshots for master house lighting stations and similar electronic control surfaces.
- 4. Any other pertinent data generated which is necessary to provide the Work.
- F. Submittal Format:

1. Electronic (PDF) submittal documents are required for review.
  2. Provide each submittal with a unique number and each shall be numbered in consecutive order.
  3. Submittals shall not be issued with other disciplines.
  4. Provide each submittal with a complete table of contents with the following information:
    - a. Project Name
    - b. Submittal number. In the case of a resubmittal, use the original submittal number immediately followed by the suffix "R" immediately followed by a unique number and shall be numbered in consecutive order.
    - c. Date of submission.
    - d. Referenced specification Section, Part, Article, Paragraph, and page number or drawing reference as applicable.
  5. Follow list by Manufacturer's data sheets, arranged as in Part 2 of this specification. If a data sheet shows more than one product, indicate the model being proposed with an arrow or other appropriate symbol.
  6. Drawings executed at an appropriate scale, but not smaller than 1/8" = 1'-0".
- G. Resubmission Requirements:
1. Make any requested corrections or change in submittals required. Resubmit for review as directed.
  2. Indicate any changes that have been made other than those requested.
  3. Approval of Submittals: Each submittal package will be returned with one of the following stamps:
  4. "No Exceptions Taken" proceed with construction; all job site coordination will be at the direction of the General Contractor.
  5. "Make Corrections Noted: No Resubmission Required" submittals have been returned with conditional approval. Corrections, as indicated on the returned drawings and/or specifications, must be made before construction can begin.
  6. "Make Corrections Noted: Submit Only Corrected Pages/Items" submittals have been returned with conditional approval. Corrections, as indicated on the returned drawings and/or specifications, must be made in writing and returned to the consultant before construction can begin.
  7. "REJECTED, Submit Specified Item" a specified item in the submittal has been rejected for the reasons noted. Re-submit in compliance with the specifications.
  8. "REJECTED, Revise and Re-submit" submittal has been rejected for the reasons noted. Re-submit in compliance with the specifications.
  9. "No Review Action Required" all information provided was for information or coordination purposes only. Review is not required.
  10. Any of the above stamps may also carry a "PARTIAL" stamp. This indicates that required information noted in the section above was not provided. Omitted items may be noted as part of the reviewed submittal, but it is the Contractor's responsibility to verify all required submittal documentation.

#### **1.10 PROJECT RECORD MANUAL**

- A. Provide electronic copies of the project record documents or as required per the General Conditions of the Project.
- B. The Project Record Manual shall be segregated into three separate bindings as follows:

1. As-Built Record Documents:
  - a. Product Data:
    - 1) List of all products incorporated in the Project inclusive of all substitutions, field changes, or revisions The list shall include Manufacturer's serial numbers.
    - 2) Manufacturer's data for each type of product conforming to the scheme above.
    - 3) Organize and bind the above in specification order.
  - b. Record drawings: Final rendition of project drawings enumerated in the Submittal section above. Provide editable computer software generated drawings using standard industry graphic standards. Hand or poorly drawn documents will not be accepted. All drawings shall be created on a computer aided drafting (CAD) system, in both a DWG and PDF file format.
  - c. Test Reports: Record findings of systems testing described in Part 3 below.
2. Operations Manual
  - a. System Operation and Instructions: Prepare a complete and typical procedure for the operation of the equipment as a system, organized by subsystem or activity.
    - 1) This procedure should describe the operation of all system capabilities.
    - 2) Assume the intended reader of the manual to be technically experienced but unfamiliar with the components and the facility.
3. Service & Maintenance Manual:
  - a. Provide an original copy of the service manual on every piece of equipment for which the Manufacturer offers a service manual. Arrange manuals in the same order as the operations manual.
  - b. Manufacturer's maintenance and care instructions.
  - c. Maintenance Instructions: include maintenance phone number(s) and hours, maintenance schedule, description of products recommended or provided for maintenance purposes, and instructions for the proper use of these products.
4. Warranty Manual:
  - a. Manufacturer's warranty statements on each product.
  - b. Date of substantial completion and ending dates for warranties for each group of products.
  - c. Software registration and licenses.
5. Include any other pertinent data generated during the Project or required for future service.
6. Appropriately duplicate data within the separate bindings when it will reasonably clarify procedures, e.g., operational data in maintenance binding.

#### **1.11 DELIVERY, STORAGE, AND HANDLING**

- A. Products shall ship and be stored in their original container to prevent damaging or entrance of foreign matter until installation.
- B. Provide protective covering during construction to prevent damaging or entrance of foreign matter.
- C. Replace, at no expense to the Owner, product damaged during storage, handling, or the course of construction.

#### **1.12 PROJECT CONDITIONS**



- A. Verify conditions on the job site applicable to this work. Notify Architect in writing of discrepancies, conflicts, or omissions promptly upon discovery.
- B. The Drawings diagrammatically show cabling and arrangements of equipment fitting the space available without interference. If conditions exist which make it impossible to install work as shown, recommend solutions and/or submit drawings to the Architect for approval, showing how the work may be installed.

### **1.13 FINAL TESTING AND OBSERVATION**

- A. Upon completion of installation and initial tests and adjustments, described in Part 3, acceptance testing shall be performed by the Consultant.
- B. The process of acceptance testing the System may necessitate moving and adjusting certain component parts; perform such adjustments without claim for additional payment.

### **1.14 WARRANTY**

- A. Warrant labor and product for two (2) years following the date of substantial completion to be free of defects and deficiencies and to conform to the drawings and specifications as to kind, quality, function, and characteristics. Repair or replace defects occurring in labor or product within the Warranty period without charge. Any cost associated with this warranty repair is the responsibility of the Contractor.
- B. This warranty is in addition to any specific warranties issued by Manufacturers for greater periods of time.
- C. Within the warranty period, answer service calls within twenty-four (24) hours during normal working hours and correct the deficiency within forty-eight (48) hours.
- D. During the warranty period, the Manufacturer shall provide a toll-free 24-hour-per-day number for telephone technical support and service request. If callback is required, calls shall be answered within thirty (30) minutes.

## **PART 2 - PRODUCTS**

### **2.01 ACCEPTABLE MANUFACTURES**

- A. Model numbers and manufacturers included in this specification are listed to establish a standard of function, performance, and quality.
- B. Refer to General and Supplementary Conditions and Division 1 Specification Sections for equipment substitution procedure. Substitution of any equipment within this specification shall require review and approval by WJHW
- C. Substitution of specified products with other qualified manufacturers and products will be considered providing:
  - 1. A request for substitution of each specific product must be made in writing by a bidding Contractor not less than ten (10) business days prior to bid for written approval of the Architect.
  - 2. Sufficient data of the products is presented for prior approval including technical data, manufacturer's specifications, samples, and, if requested, results of independent testing laboratory tests.
  - 3. Written permission is obtained for the substitution from the Owner or Owner's Representative.
- D. Providing product not specifically specified without prior written approval by the Owner, Architect, and/or Architect's Consultant shall not be accepted.

## **2.02 GENERAL**

- A. Products shall be new, free from defects and listed by an NRTL when an applicable NRTL Standard exists.
- B. Provide product of a given type from one manufacturer.
- C. Regardless of the length or completeness of the descriptions below, provide product that meets or exceeds the specified product's published functionality.

## **2.03 CABLING AND ACCESSORIES**

- A. All cable shall be compliant with NEC and NRTL listed. Any NRTL listing must be available at the time of bid.
- B. All electrical conductors installed under this contract, except where otherwise specified, shall be soft drawn annealed stranded copper having a conductivity of not less than 98% of pure copper, and meet appropriate ratings (e.g., CMR, CMP, etc.)
- C. Cable shall carry appropriate fire rating (e.g., CMR, CMP, OFNR, OFNP, etc.) on jacket of cable.
- D. Where cables are routed through cable tray, provide tray rated cable of equal specification.
- E. Where cables are run exposed through a return air plenum, provide plenum rated cable of equal specification.
- F. Shielded cables located in raceways shall have aluminum foil shield with drain wire.
- G. The Belden cables listed below are approved for use on this project and are listed to set the acceptable standard of performance. If field conditions or actual cable pathway requires tray or plenum cable, provide version of cable that meets required rating. Cables from Carol, Liberty, and West Penn are also acceptable provided they meet the performance specifications of the approved listed cables.
- H. DMX512 (E-DMX) distribution cable:
  - 1. Provide 23 AWG four twisted pair data cable.
  - 2. Pair Color Code Chart:
    - a. 1 – White/Blue Stripe and Blue
    - b. 2 – White/Orange Stripe and Orange
    - c. 3 – White/Green Stripe and Green
    - d. 4 – White/Brown Stripe and Brown
  - 3. Insulation: Polyolefin
  - 4. Inner/Outer Jacket Material: PVC – Polyvinyl Chloride
  - 5. Nominal Impedance: 100 ohms.
  - 6. Nominal Velocity of Prop.: 72%
  - 7. Capacitance between conductors: 15.0 pF/ft.
  - 8. Acceptable product:
    - a. Belden 1583A (Category 5E).
- I. DMX512 (E-DMX) distribution cable – Stage Electric Drops:
  - 1. Provide extra rugged, flexible control cable (Ethernet) for connection of NET outlets on grid to electric batten distribution.
  - 2. Cable to be four-pair, double shielded, low-capacitance.
  - 3. Conductors: 26 AWG tinned, annealed copper stranded 7 x 0.16.
  - 4. Connector: Provide with EtherCon connector by Neutrik®.

5. Assembly: pairs cabled with Kevlar strength member.
  6. Shield: (inner) aluminum/Mylar, 100% coverage (outer) tinned copper braid, 80% coverage.
  7. Conductivity: 15ohms per 100 meters @ 20C.
  8. Impedance:  $100 \pm 15$  ohms 1-100MHz.
  9. Acceptable product:
    - a. TMB & Associates ProPlex or equivalent.
- J. DMX512 Backup Control Signal Distribution Cable:
1. Provide 24 AWG two twisted pair cable.
  2. Insulation: Foam polyethylene.
  3. Shield: aluminum foil/polyester tape.
  4. Capacitance between conductors: 12.5 pF/ft.
  5. Acceptable product:
    - a. Belden 9729
- K. Architectural Lighting DMX Cable:
1. Provide 24 AWG two twisted pair cable.
  2. Insulation: Foam polyethylene.
  3. Shield: aluminum foil/polyester tape.
  4. Capacitance between conductors: 12.5 pF/ft.
  5. Acceptable product:
    - a. Belden 9842
- L. Preset Station Signal Distribution Cable:
1. Provide 16 AWG single twisted pair cable.
  2. Insulation: PVC-polyvinyl chloride.
  3. Shield: unshielded.
  4. Capacitance between conductors: 33 pF/ft.
  5. Acceptable product:
    - a. Belden 8471
- M. Multi-Conductor SO Type Cable:
1. Provide multi-conductor cable with black neoprene jacket.
  2. Conductivity: not less than 98%.
  3. Conductor: soft drawn annealed stranded copper.
  4. Minimum Conductor Temperature: 90° C.
  5. Size: No. 12 AWG minimum.
  6. No. of Conductors: As required by circuits shown.
  7. Acceptable product:
    - a. Cole Wire & Cable
    - b. Carol
    - c. Rome

## 2.04 POWER DISTRIBUTION

A. Wall-Mounted Motorized Breaker Panels (MBP)

1. General

- a. Breaker Panels shall be UL Listed,
- b. Breaker Panels shall consist of a main enclosure with 12, 24, or 48 pole breaker subpanels, integral control electronics for low voltage terminations and provision for accessory cards
- c. The panel shall be constructed of 16-gauge galvanized steel. All panel components shall be properly treated or finished in fine-textured, scratch resistant paint
- d. The unit shall provide interior cover over the control electronics and accessory cards to allow access only to class 2 wiring and prevent direct access to class 1 line voltage components
- e. Circuits as described in schedule
- f. Breakers shall provide manual switching control while power is unavailable

2. Each panel shall have a keypad and LCD display for rack configuration, backup, and fault indication.

3. Panels shall employ USITT DMX-512 control format.

4. An Ethernet connection shall provide advanced control of relays over streaming ACN (sACN) and transmit status, control override, and measured energy usage per branch circuit via an internal Web UI or central monitoring interface

5. The panel shall have a UL924-listed contact input for use in Emergency Lighting systems.

6. Electrical

- a. Breaker Panels shall be available to support power input from:
  - 1) 120/208V three phase 4-wire plus ground
- b. Breaker panels shall support main circuit breaker options:
- c. As required for functional system based on existing electrical service or Division 26 documents

7. Breaker Panel Accessories

- a. A low voltage 0-10V dimming option shall provide up to 24 0-10v control outputs that are linked to relay circuits within the panel. Each output shall support up to 400mA of current sink per output
- b. A contact input option shall provide 24 dry contact inputs to be linked for direct or group relay control, to activate a preset, or to activate a sequence. Controller software shall allow for normally open maintained, normally closed maintained, or momentary toggle

8. Provide with main disconnect breaker option.

9. Quantity: As shown in drawings

10. Acceptable Product

- a. Lyntec - LCP Series Lighting Control Panelboards
- b. Strand Lighting – Contact Relay Panel
- c. Electronic Theatre Controls – Sensor IQ Panel

B. Distribution Wiring Devices

1. General

- a. All power distribution devices overall assembly shall be listed by a nationally recognized test lab.

- b. All dimmed circuit connectors shall be 20A grounded stage pin type. All switched circuits connectors shall be 20A twistlock type. All connector types provided shall be of a single manufacture.
  - c. All pigtails shall be three-wire type "SOW" rubber jackets cable. All pigtails to be provided with proper strain relief.
  - d. All power distribution devices shall be fabricated from minimum 18-gauge galvanized steel and finished in black fine-textured powder coat paint unless noted otherwise. Boxes shall be free from burrs, sharp corner, and overhanging edges.
  - e. Circuits for Raceways and Plugging Boxes shall be labelled with 2" yellow on black Brady numbers. Numbers shall be located so that they are no obscured by cabling. Circuits shall be assigned and labelled per schedules on drawings
  - f. Circuits for Wall Boxes and Floor Pockets shall be labelled with 1" yellow on black Brady numbers. Numbers shall be located so that they are no obscured by cabling. Circuits shall be assigned and labelled per schedules on drawings. As a rule, circuits shall number Stage Left to Stage Right, Down stage to Upstage.
  - g. All power distribution devices shall be provided with appropriate mounting hardware.
  - h. All multi-conductor cable is to be provided with Kellems-type strain relief grips at each end of the cables with intermediate strain relief as required.
  - i. Provide connector strips, gridiron junction boxes (GIJB), and associated hardware for over the stage lighting. Coordinate connector strip lengths for electrics with the theatrical rigging equipment. Provide all multi-conductor cables allowing the devices to fly to a low trim as indicated on the TR sheets. The cable is to be provided with necessary cable strain relief grips as part of the cable management system. Provide rugged network control cables to parallel the multi-conductor cable runs. Verify all electrical circuits and label all circuit numbers as specified.
2. Wall Mounted Boxes (WB)
- a. Provide a wall plug-box designed for recessed mounting.
  - b. Construction: code gauge steel.
  - c. Connectors: female 20 Ampere twistlock-type connectors surface mounted in the plug-box.
  - d. Circuits: number of circuits as specified on drawings.
  - e. Labeling: circuits are labeled with yellow letters on black background.
  - f. Overall assembly UL listed.
  - g. Quantity: As shown in drawings.
  - h. Acceptable product:
    - 1) Altman 450 series
    - 2) ETC 9200 series
    - 3) Strand Lighting 9600 series
    - 4) SSRC RM series
3. Pipe Mounted Boxes (PB)
- a. Provide a plug box designed for pipe mounting.
  - b. Construction: code gauge steel.
  - c. Pigtails: SO type cable. Provide lengths as shown on drawings.
  - d. Connectors: female 20A twistlock connectors on the end of each of the pigtails and flush mounted 20A parallel blade receptacles for convenience circuits.
  - e. Circuits: number of circuits as specified on drawings.

- f. Labeling: circuits are labeled with yellow letters on black background.
  - g. Overall assembly UL listed.
  - h. Quantity: As shown in drawings.
  - i. Acceptable product:
    - 1) Altman 450 series
    - 2) ETC 9300 series
    - 3) Strand Lighting 9600 series
    - 4) SSRC PM series
4. Floor Pocket (FP)
- a. Provide floor pockets designed for flush mounting in the stage.
  - b. Back box construction: 16-gauge steel.
  - c. Top cover is hinged, fabricated from tool grade aluminum and notched to allow the cover to close with cables plugged in to each circuit.
  - d. Panel mounted connectors:
    - 1) 20A 2P&G stage pin for dimmed circuits.
    - 2) 20A twistlock (NEMA L5-20R) for relay switched circuits
    - 3) 20A parallel blade for convenience circuits
    - 4) XLR-5pin for DMX
  - e. Provide voltage barrier for low voltage elements in box.
  - f. Provide white LED strip lights in each floor pocket. Strip lights to be controlled from a switch in the Stage Manager's Panel. Coordinate conduit requirements with Div. 26.
  - g. Overall assembly UL listed.
  - h. Labeling: circuits are to be labeled with yellow letters on black background.
  - i. Quantity: As shown in drawings.
  - j. Acceptable product:
    - 1) Altman 450 series
    - 2) SSRC FP series
    - 3) ETC 8500 series
5. Gridiron Junction Boxes (GJB)
- a. Provide a junction box designed to mount to the gridiron structure.
  - b. Construction: 16-gauge, cold rolled steel with removable covers.
  - c. Size: minimum 18"W X 6"H X 12"D with four mounting holes. Box will be provided to properly to accommodate number of circuits specified on drawings.
  - d. Finish: fine-texture, scratch resistant, black-powder coating.
  - e. Termination: barriered, screw clamp type terminal strip(s). Terminals to be sized for the circuit, according to the circuit amperage as required.
  - f. Grounding: junction box will have grounding lugs.
  - g. Up to two (2) GJBs may be required per stage electric; reference circuit count per drawings.
  - h. Overall assembly UL listed.
  - i. Provide Kellems-type grips for each multi-conductor cable entering the junction box.
  - j. Acceptable product:

- 1) Altman GJB series
  - 2) ETC 8700 series
  - 3) SSRC GB series
  - 4) Strand Lighting 9600 series
6. Distribution Raceway (R)
  - a. Provide a connector strip style connector device designed for mounting to pipe battens. Unit is to have a barrier strip for use in conjunction with control network distribution.
  - b. Construction: 16-gauge, cold-rolled steel with removable covers.
  - c. Size: approximately 4"x4" in section, provided in lengths as shown on TR drawings.
  - d. Finish: fine texture, scratch resistant, black powder coat.
  - e. Bracket: provide (1) steel hanging bracket for every five (5) feet of strip.
  - f. Pigtails: SO type cable, 18" in length with Heyco strain relief.
  - g. Connectors: female 20A twistlock connectors on the end of each of the pigtails and flush mounted 20A parallel blade receptacles for convenience circuits
  - h. Circuits: number of circuits as specified on drawings with labels on both sides of connector strip.
  - i. Termination: circuits terminated at a barrier terminal strip in a terminal box located, as specified on drawings.
  - j. Overall assembly UL listed.
  - k. Quantity: As shown in drawings
  - l. Acceptable product:
    - 1) Altman 450 series
    - 2) ETC 9900 series
    - 3) Strand 9600 series
    - 4) SSRC BAL series
7. SO Cable Cradles:
  - a. Provide properly sized cable cradles for SO cable service from gridiron junction box to plug-strip connector device.
  - b. Acceptable product:
    - 1) ETC 8800 Series
    - 2) Altman 512 Series.
8. SO Cable Kellems-type Grips:
  - a. Provide properly sized Kellems-type grips for SO cable service from gridiron junction box to plugstrip connector device.
  - b. Quantity: As required for the specified number of circuits
  - c. Acceptable product:
    - 1) Hubbell or equivalent.
9. Distributed Dimming
  - a. Provide DMX-controlled portable dimmer module design for silent operation for use with conventional fixtures
  - b. Module to be constructed from aluminum with anodized aluminum heat sink.
  - c. Color: black

- d. Module to operate using 120V power from 20A circuits located in system distribution devices.
- e. Power lead connectors
  - 1) Input: twistlock
  - 2) Output: parallel blade (Edison)
- f. The module shall have 2500V isolation between power and control components.
- g. Module to be convection cooled
- h. Module to be yoke or pipe mounted. Supply with C-Clamp
- i. Accessories:
  - 1) Provide with 10' power extension with twist-lock connector
  - 2) Provide with 10' DMX data cable and DMX terminator.
- j. Quantity: (8)
- k. Acceptable products:
  - 1) ETC single module distributed dimmer ES750
  - 2) Strand LIGHTPACK module

## **2.05 CONTROL EQUIPMENT**

### **A. Control Distribution Rack (CDR)**

- 1. The control distribution rack shall be an EIA compliant 19" wall mount rack.
- 2. Center section and back pan shall be 16 gauge steel, finished in a black textured powder coat.
- 3. Rack rails shall be constructed of 11 gauge steel with tapped 10-32 mounting holes in universal EIA spacing.
- 4. Rack height shall be sized to contain all equipment as shown in the contract documents.
- 5. Rack shall have an overall depth of 22.3." Useable depth shall be 20," extending into the back pan 3.5."
- 6. Accessories:
  - a. Provide a Furman M-8Lx type pull out panel light in the rack.
  - b. Provide a magnetic LED work light with 36" power supply cord.
  - c. Provide one (1) locking storage drawer and all necessary vent or blank panels.
- 7. The control distribution rack shall be provided by the Lighting Control System Manufacturer.
- 8. Quantity and details: As shown on drawings
- 9. Acceptable product:
  - a. Mid-Atlantic DWR series

### **B. Control Distribution Panel (CDP)**

- 1. Provide wall-mounted unit to house components within as described on the drawings
- 2. Provide a low profile, wall mounted NEMA 1 enclosure constructed of 16 gauge steel.
- 3. Enclosure shall have a hinged, locking door of same construction.
- 4. Enclosure shall be properly vented to maintain acceptable equipment operating temperature.
- 5. Enclosure shall be sized to house all necessary components for the lighting control network.



6. Provide an integrated rack rail system to accommodate adjustable and easy mounting of network components.
  7. Rails shall be constructed of 11 gauge steel with tapped 10-32 mounting holes in universal EIA spacing.
  8. Enclosure shall have cable management features including pass-through on back pan, sufficient cable tie points and knockouts on top, bottom and sides.
  9. Enclosure shall have a powder coat finish. Color per Manufacturer's standard.
  10. Enclosure shall be UL listed.
  11. Quantity and details: As shown on drawings
  12. Acceptable product:
    - a. ETC DIN14 or DIN28 Enclosure
    - b. Pathway 1100 Series Enclosures
    - c. Strand Lighting Vision.NET DIN Rail Enclosure
- C. UPS Backup Power / Surge Protection
1. Provide a rack mountable UPS backup to support equipment located in the control distribution racks (provide with one (1) spare battery) for the Auditorium.
  2. Output Power Capacity: 1400VA/1050W
  3. Provide a DIN rail mountable UPS backup to support equipment located in the control distribution panel (provide with one (1) spare battery) for the Black Box.
  4. Output Power Capacity: 500VA/120V
  5. Input 120V/ Output 120V
  6. Interface Port: DB-9 RS-232
  7. Extended runtime model
  8. Rack Height: 2 Units
  9. Filtering: Full time multi-pole noise - filtering: 0.3% IEEE surge let-through: zero clamping response time: meets UL 1449
  10. The UPS shall be provided by the lighting control system manufacturer.
  11. Quantity: As shown in drawings.
  12. Acceptable product:
    - a. APC
    - b. Tripp Lite
    - c. Middle Atlantic
- D. Control Components
1. Ethernet Switches (ESW)
    - a. Provide business grade Gigabit PoE+, Layer 2 managed Ethernet switches in the CDR as shown in the TL series documents.
    - b. Switch shall include 24 POE+ ports meeting IEEE802.3at standard
    - c. Switch shall include port routing via separate VLAN subnets
    - d. Switch shall be equipped with LED indicators for power status, port status, bandwidth utilization, collision detection and speed indication.
    - e. Switch shall have a built-in web-based management interface to provide easy to use management through a standard browser. Provide with all required software management tools.

- f. Provide rack mount kit and required hardware and cables for stacking in the Auditorium.
  - g. Provide DIN rail mount kit and required hardware and cables for stacking in the Black Box.
  - h. Each network location shall have a dedicated input point on the network switch. Dedicated input points shall be clearly labeled to identify connected network device at the patch panel. Patching shall not be required.
  - i. Ethernet switch shall be tested and approved by Lighting Control System Manufacturer for compatibility with all connected devices.
  - j. Quantity: As required by design
2. Network Node/Gateway
- a. Provide rack-mounted DMX Ethernet node/Gateway to generate DMX to devices located at theatrical and house architectural lighting positions in the Auditorium.
  - b. Provide DIN rail-mounted DMX Ethernet node/Gateway to generate DMX to devices located at theatrical and house architectural lighting positions in the Black Box.
  - c. Nodes shall have (4) screw terminal or 5-pin DMX connectors for a total of 4 DMX universes for distribution over the Ethernet system.
  - d. DMX Node shall have LEDs for indication of power, network activity, and DMX port configuration.
  - e. Each input shall route directly to the Ethernet Switch located in the assigned Dimmer Rooms without the need for patching.
  - f. Quantity: As required by design.
  - g. Acceptable product:
    - 1) Pathway rack or DIN rail mounted gateway
    - 2) Strand Lighting rack or DIN rail mounted gateway
    - 3) ETC rack or DIN rail mounted gateway
3. DMX-512 Distribution (repeater/splitter)
- a. Provide DMX512 distribution for connection to control devices. Modules shall provide one optically isolated DMX512 signal output capable of driving thirty-one (31) receiving devices on a single DMX line.
  - b. DMX device drivers shall have maintained outputs Isolation: input to output signal isolation is provided by an opto-isolator designed for data use.
  - c. Provide quantity as required by design.
  - d. Provide DIN mountable as required.
  - e. Provide matching power supply.
  - f. Quantity: As required by design
  - g. Acceptable product:
    - 1) Pathway eDIN 1009 DMX/RDM Repeater
    - 2) Strand Lighting RDM-6WALL Signal Splitter
    - 3) ETC Response Opto 8 Port DIN rail
4. eDIN Demultiplexer Module:
- a. Provide a rack mounted DMX to 0-10v signal converter for house lighting as required. Reference Division 26 documents.
  - b. Each architectural circuit shall have an independent output by the Demultiplexer; there shall be no daisy chain runs between circuits.

- c. Quantity: As required by Design.
- d. Acceptable product:
  - 1) Pathway Connectivity #1004 Demultiplexer (DMX-to-Analog)
  - 2) ETC Response 0-10V Gateway
- E. Plates and Devices
  - 1. Network Receptacle Station/Gateway (NET)
    - a. Provide a remote plug-in station for connection of control console and portable DMX Gateways at control booth and other locations as noted in the drawings.
    - b. Station shall be provided with a Neutrik RJ45 jack. Each jack shall be rated for use in harsh commercial conditions.
    - c. Station will contain the following components:
      - 1) RJ 45 jack with punch down block, provide Neutrik EtherCon type receptacle as indicated on drawings.
      - 2) Station faceplates shall be .80" aluminum, finished in fine texture, scratch-resistant black powder coat.
      - 3) Station back box will be a minimum of 2.5 inches.
      - 4) Station shall have silk screened graphics white in color.
      - 5) Provide a Lamacoid label that de-notes, using an alpha-numeric labeling convention, the switch location and network port number.
    - d. These network connections shall also be configured with a back box and mounting hardware for mounting on the FOH lighting galleries or backstage.
    - e. Each Network jack will route directly to the Ethernet Switch located in the assigned Dimmer Rooms without the need for patching.
    - f. No daisy chaining between jacks or splicing of Category 5e and above cable is allowed.
    - g. Quantity: As shown in drawings.
    - h. Acceptable product:
      - 1) Pathway Network station
      - 2) Strand Lighting station
      - 3) SSRC station
      - 4) ETC Network station
  - 2. DMX512 Distribution Box/Network Gateway (NN1/NN2):
    - a. Provide a wall plug-in box designed for flush mounting.
    - b. Provide a plug-in box designed for pipe mounting.
    - c. Node shall provide the quantity of universes, as specified, of DMX512 control for intelligent lighting or other DMX512 addressable devices.
    - d. Power for the node shall be provided over the Cat6 cable via the network switch. All nodes shall be IEEE 802.3af compliant and UL listed. Power consumption shall not be greater than 3 watts.
    - e. Ports:
      - 1) DMX Ports shall comply with the requirements of the USITT DMX512.
      - 2) The DMX port shall be software-configurable for either input or output.
      - 3) DMX inputs shall be fully opto-isolated from the node electronics and from each other.

- 4) DMX outputs shall be earth-ground referenced.
    - 5) DMX Ports shall be capable of withstanding fault voltages of up to 250VAC without damage.
  - f. Node modules will mount within a standard electrical box or enclosure.
  - g. Each input shall route directly to the Ethernet Switch located in the assigned Dimmer Rooms without the need for patching.
  - h. Quantity: As shown in drawings.
  - i. Acceptable product:
    - 1) Pathway Connectivity Pathport Node
    - 2) Strand Lighting Node
    - 3) ETC DMX Node
3. Portable Network Gateways:
- a. Provide portable output nodes and input node for pipe mounting at any NET station.
  - b. Each node shall be equipped with a molded RJ 45 connector on a jacketed cable (see specification for flexible Category 6 cable) for connection to the lighting control network (NET).
  - c. Node shall provide the quantity of universes, as specified, of DMX512 control for intelligent lighting or other DMX512 addressable devices.
  - d. Power for the node shall be provided over the Category 6 cable via the network switch. All nodes shall be IEEE 802.3af compliant and UL listed. Power consumption shall not be greater than 3 watts.
  - e. Ports:
    - 1) DMX Ports shall comply with the requirements of the USITT DMX512.
    - 2) The two DMX ports shall be software-configurable for either input or output.
    - 3) DMX inputs shall be fully opto-isolated from the node electronics and from each other.
    - 4) DMX outputs shall be earth-ground referenced.
    - 5) DMX Ports shall be capable of withstanding fault voltages of up to 250VAC without damage.
  - f. Double Universe Node shall contain the following components:
    - 1) RJ 45 connector. Connector is to be RJ Lnx model ENSAM315.
  - g. Provide C-clamp for pipe mounting.
  - h. Quantity: (2) Output Nodes and (1) Input Nodes
  - i. Acceptable product:
    - 1) Pathway Connectivity Pathport Node
    - 2) Strand Lighting Node
    - 3) ETC Portable DMX Node
4. DMX512 Distribution (DMX):
- a. Provide DMX512 distribution for connection to wiring devices in the Classroom and Auditorium.
  - b. Modules shall provide one optically isolated DMX512 signal output capable of driving thirty-two (32) receiving devices on a single DMX line.
  - c. Provide a wall plugging box designed for surface mounting.
  - d. Construction: code gauge steel.

- e. Connectors: Neutrik 5 conductor XLR, flush mounted.
- f. Circuits: located as shown on the drawings.
- g. Labeling: labeled with yellow letters on black background.
- h. Quantity: As shown in drawings.
- i. Acceptable product:
  - 1) Pathway Connectivity station
  - 2) Strand Lighting station
  - 3) SSRC station
  - 4) ETC station
- 5. Control Receptacle Station (CRS)
  - a. Provide a flush-mounted control station for connection of the control console (over network) and portable house light controller.
  - b. Station will contain receptacle components as described on the drawings.
  - c. Station faceplates shall be .80" aluminum, finished in fine texture, scratch resistant black powder coat.
  - d. Station Back box will be a minimum of 2.5 inches deep
  - e. Station shall have white, silk screened graphics
  - f. Provide a Lamacoid label for network jacks that denotes, using alpha-numeric labelling convention, the switch location and network port number.
  - g. Each network jack shall route directly to the Ethernet switch without the need for patching.
  - h. No daisy-chaining between jacks or splicing on network cabling is allowed.
  - i. Quantity: As shown in drawings.
  - j. Acceptable product:
    - 1) Pathway Connectivity station
    - 2) Strand Lighting station
    - 3) SSRC station
    - 4) ETC station

## **2.06 CONTROL CONSOLE AND ACCESSORIES**

### **A. Overview**

- 1. Provide a control console for direct operation of theatrical fixtures and development of user-presets to be stored for recall via the Architectural Control Sub-system specified in this section.
- 2. Provide initial setup as directed as part of the system commissioning process.

### **B. Control Console**

- 1. The lighting control console shall be a microprocessor-based system specifically designed to provide complete control of stage, studio, and entertainment lighting systems.
- 2. The system shall also be able to control third party ACN devices directly. The system shall provide control of 2,048 or 12,288 outputs on a maximum of 32,768 control channels.
- 3. A maximum of 10,000 cues, 999 cue lists, 1,000 groups, 1,000 presets, 4 x 1,000 palettes (Intensity, Focus, Color and Beam), 1,000 effects, 1,000 macros and 1,000

curves may be contained in non-volatile electronic memory and stored to an onboard hard disk or to any USB storage device.

4. The console may be placed in Tracking or Cue Only mode by the user as a system default and overridden on individual record actions as required.
5. A Master Playback fader pair and dedicated Grand Master/Blackout shall be provided.
6. Twenty user configurable playback faders shall be provided for additional preset, palette, submaster and grand master control.
7. Up to six USB fader wings may be connected to the console, for a maximum of 300 submasters and/or 200 playback faders. USB fader wings may be rigidly connected to the main console to provide a "single connected unit" with no external cables required. The wings also may be connected via USB cables and used "on the side."
8. A high-resolution level wheel shall be provided to control intensity for selected channels and scrolling within selected displays. Four page-able high-resolution encoders shall be provided for control of other non-intensity parameters. Non-intensity parameters shall be controllable via the encoders or keypad controls, without need of an external pointing device.
9. Rotary encoders for non-intensity parameters shall be labeled by means of an integral LCD display mounted above or below the encoders on the main console. The display shall show the currently loaded functions of the encoders based on the current selections. Systems using encoders with no LCD labeling shall not be acceptable.
10. Control and programming features for automated fixtures shall also include: a standard library of fixture profiles, the ability to copy and edit existing profiles and create new profiles, patch displays including channel and output addressing, 16-bit fade resolution, color characterization allowing color mixing and storing in Hue and Saturation or native device values.
11. The system shall direct user input through on-screen dynamic prompts and integral LEDs on console keys indicating current operating mode. A context sensitive on-line Help feature shall explain and provide an example of the operation of each feature of the system.
12. A row of softkeys shall be provided, which change function based on the selection and context of the console. These softkeys shall be labeled via an adjacent LCD display that shows their current functions at all times. Systems using softkeys with no LCD display shall not be acceptable.
13. Console software upgrades shall be made by the user via a USB port; changing internal components shall not be required.
14. The console operating software shall be loaded into program execution memory from the internal hard drive when the console is powered. In the event of an uncontrolled shutdown, the console shall return to its last output state when power is restored.
15. Console power shall be 95 – 240V AC at 50 or 60Hz, supplied via a detachable power cord.
16. Accessories:
  - a. Provide (2) external touch screen high resolution DVI monitors that will display system information, including playback status, live output and blind values for all record targets.
  - b. Provide (1) fully-functioning, detachable alphanumeric keyboard. The keyboard shall allow labeling of channels, cues, presets, groups, palettes, effects, macros, curves and the show. An integral electronic keyboard shall be provided.
  - c. Provide console client software kit
  - d. Provide one (1) 1x20 fader wing with associated power supplies.

- e. Provide with dust cover
  - f. Provide with USB mouse
  - g. Provide with 25' network cable
  - h. Provide (1) Littlite with 3-pin XLR connector
  - i. Provide (1) USB jump drive, minimum 8gb
17. Quantity: (1)
18. Acceptable product:
- a. Electronic Theater Controls ION XE 20 with 2,048 channels of control.
- C. Control Console
- 1. The lighting control console shall be a microprocessor-based system specifically designed to provide complete control of stage, studio, and entertainment lighting systems.
  - 2. The system shall also be able to control third party ACN devices directly. The system shall provide control of 1,024 or 6,144 outputs on a maximum of 32,768 control channels.
  - 3. A maximum of 10,000 cues, 999 cue lists, 1000 groups, 1000 presets, 4 x 1000 palettes (Intensity, Focus, Color and Beam), 1000 effects, 1000 macros and 100 curves may be contained in non-volatile electronic memory and stored to an onboard hard disk or to any USB storage device.
  - 4. The console may be placed in Tracking or Cue Only mode by the user as a system default and overridden on individual record actions as required.
  - 5. A Master Playback fader pair and dedicated Grand Master/Blackout shall be provided.
  - 6. A high-resolution level wheel shall be provided to control intensity for selected channels and scrolling within selected displays. Four page-able high-resolution encoders shall be provided for control of other non-intensity parameters. Non-intensity parameters shall be controllable via the encoders or keypad controls, without need of an external pointing device.
  - 7. Control and programming features for automated fixtures shall also include: a standard library of fixture profiles, the ability to copy and edit existing profiles and create new profiles, patch displays including channel and output addressing, 16-bit fade resolution, color characterization allowing color mixing and storing in Hue and Saturation or native device values.
  - 8. The system shall direct user input through on-screen dynamic prompts and integral LEDs on console keys indicating current operating mode. A context sensitive on-line Help feature shall explain and provide an example of the operation of each feature of the system.
  - 9. A row of softkeys shall be provided, which change function based on the selection and context of the console. These softkeys shall be labeled via an adjacent LCD display that shows their current functions at all times. Systems using softkeys with no LCD display shall not be acceptable.
  - 10. Console software upgrades shall be made by the user via a USB port; changing internal components shall not be required.
  - 11. The console operating software shall be loaded into program execution memory from the internal hard drive when the console is powered. In the event of an uncontrolled shutdown, the console shall return to its last output state when power is restored.
  - 12. Console power shall be 95 – 240V AC at 50 or 60Hz, supplied via a detachable power cord.
  - 13. Accessories:

- a. Provide (2) external touchscreens high resolution DVI monitors that will display system information, including playback status, live output and blind values for all record targets.
  - b. Provide (1) fully-functioning, detachable alphanumeric keyboard. The keyboard shall allow labeling of channels, cues, presets, groups, palettes, effects, macros, curves and the show. An integral electronic keyboard shall be provided.
  - c. Provide with dust cover
  - d. Provide with USB mouse
  - e. Provide with 25' network control cable
  - f. Provide (1) Littlite with 3-pin XLR connector
  - g. Provide (1) USB jump drive, minimum 8gb
14. Quantity: (1)
15. Acceptable product:
- a. Electronic Theater Controls Element 2 with 6,144 channels of control
- D. Handheld Remote Focus: (Auditorium)
- 1. The portable access unit shall be a wired or wireless remote-control device that allows access to console programming and playback functions.
  - 2. The device shall be an 8-inch tablet with a capacitive multi-touch display.
  - 3. Remote unit shall connect through an RJ45 and wirelessly via a WAP
  - 4. Contractor shall provide WAP that meets District standards for WiFi function and security
  - 5. Contractor shall provide the following accessories:
    - a. Charging/cable Adaptor
    - b. Hand Strap.
    - c. Shoulder Strap
    - d. EETI Stylus Pen
    - e. Office Dock
    - f. VESA Dock
  - 6. Acceptable product:
    - a. Electronic Theatre Controls ETCpad

## **2.07 ARCHITECTURAL CONTROL SYSTEM**

- A. Processing – Provide either a rack mounted control processor located in the control distribution rack or provide distributed processing at each control station.
- 1. The processing rack shall receive output data from a lighting control console and/or architectural control stations, process the information it receives and distribute the information to DMX-controlled panels and devices.
  - 2. The processing rack shall be capable of snapshotting (4) universes of DMX for playback on recorded presets.
  - 3. Processing Racks shall be designed to support the following wire terminations:
    - a. AC (single phase)
    - b. Echelon link power
    - c. 24Vdc
    - d. DMX512 In



- e. DMX512 Out
  - f. RS232 Serial In/Out
  - g. Net3 Unshielded Twisted Pair (UTP) or ST fiber optic
- B. Configuration – Configure architectural control system screens in conjunction with User prior to commissioning. Base configuration shall accommodate the following basic layouts:
  - 1. Main Navigation
  - 2. User configurable named presets (2 pages to be programmed at training)
  - 3. House light individual control
  - 4. House light presets
  - 5. Work light individual control
  - 6. Work light presets
  - 7. Blue light individual control
  - 8. Blue light presets
- C. Stations - General
  - 1. Master stations shall be located in the control booth, backstage and as noted on the contract documents.
  - 2. Provide preset stations as described below and shown in drawings.
  - 3. All audience exposed switches shall be provided with locking covers and shall be painted a custom color as determined by the architect.
- D. Acceptable product:
  - 1. Electronic Theatre Controls Paradigm System with ERn
  - 2. Strand Lighting Vision.net
  - 3. Interactive Technologies CueServer3 Pro
- E. House Lighting Fixture Control
  - 1. Contractor shall be responsible for installation and termination of DMX and/or 0-10v to all architectural house light fixtures. It is the Contractor's responsibility to verify operation on ground before fixtures are permanently installed. Any required DMX and/or 0-10v controlled interface shall be provided by the Contractor including equipment parts, labor and installation of equipment.
- F. Control Stations/Receptacles
  - 1. SMP Rack Panel (SMP)
    - a. Provide standard 19" panel to be mounted in SMP rack provided under 27 41 16
    - b. Panel shall contain the following:
      - 1) House Light Master touchscreen station (HLM)
      - 2) (1) Neutrik RJ-45 network receptacle (NET)
      - 3) Network labels as required
      - 4) On/Off switch for Floor Pocket LED power supply
      - 5) On/Off switch for Stage Edge Safety Light power supply
    - c. Coordinate panel size and material type to match AV components in the SMP rack.
  - 2. Portable House Light Master Station
    - a. Provide a portable house light master station as specified above with a clam type protective cover that also functions as a stand.
    - b. Provide with 25' detachable connection cable.

- c. Quantity: (1)
- d. Acceptable product:
  - 1) Electronic Theatre Controls – Unison Paradigm handheld touchscreen
  - 2) Strand Lighting – Vision.net portable touchscreen station
  - 3) Interactive Technologies – CueServer2 Insite touchscreen station
- 3. Push Button Preset Stations (HL2)
  - a. Provide two, five and ten push button stations as shown on drawings
  - b. Stations shall be mounted within a one-gang back box
  - c. Station finish shall be black in technical areas color selected by Architect for public spaces.
  - d. Two button stations (HL2) shall be programmed for on/off operation with on button being a fully programmable preset
  - e. Quantity: As shown on the drawings.
  - f. Acceptable product:
    - 1) Electronic Theatre Control Unison Heritage
    - 2) Strand Lighting Vision.net
    - 3) Interactive Technologies Ultra Stations
- 4. Index strip preset/slider station (HLX)
  - a. Provide five pushbutton station with one slider to act as a local control for the Theatrical rigging index strip light
  - b. Stations shall be mounted within a one-gang back box
  - c. Station finish shall be black.
  - d. Five button stations shall have four programmable presets plus off. Two of these presets will be dedicated to the blue and white light circuits of the index strip light. Slider will be used for dimming index strip circuits for performance The remaining two presets may include house lights, work lights, blue lighting and will be programmed with the User.
  - e. Quantity: As shown on the drawings.
  - f. Acceptable product:
    - 1) Electronic Theatre Control Unison Heritage
    - 2) Strand Lighting Vision.net

## **2.08 EMERGENCY LIGHTING EQUIPMENT**

- A. Emergency Lighting Transfer System (ELTS)
  - 1. Provide an emergency lighting transfer system that shall switch dimmed and non-dimmed lights to emergency power if normal electricity fails;
  - 2. The ELTS shall be enclosed in a NEMA-1 rated steel cabinet and shall be UL rated;
  - 3. The ELTS shall accept fire and auxiliary open circuit signals for activation;
  - 4. Provide with one (1) remote controlled key switch station located at the stage manager's rack;
  - 5. Quantity: As shown on drawings.
  - 6. Acceptable product:
    - a. Electronic Theater Controls Emergency Lighting Transfer Switch

1) Model No. ELTS2-1-M-3P-6

B. DMX Emergency Bypass Control (DEBC)

1. Provide a bypass means to trigger special-purpose lighting presets and bypass normal lighting controls during emergency or panic situations
2. The DMX Emergency Bypass Controller shall be capable of overriding a single universe of ANSI E1.11–2008, USITT DMX512-A control signals from "Normal" to "Bypass" when a trigger signal is detected.
3. The DMX Emergency Bypass Controller shall poll the bypass trigger input after a power loss and react upon start up.
4. The default or recorded sequence shall be recalled immediately on restart if the trigger is also applied at restart.
5. The DMX Emergency Bypass Controller (DEBC) enclosure shall provide discrete high and low voltage wiring compartments with voltage barrier.
6. The DMX Emergency Bypass Controller (DEBC) shall have a LED indicator visible from the exterior of the enclosure.
7. The DMX Emergency Bypass Controller shall be UL Section 924 Listed for interaction with similarly listed products.
8. Quantity: As shown on drawings.
9. Acceptable product:
  - a. Electronic Theatre Controls DMX Emergency Bypass Controller
  - b. Strand DMX Bypass

C. Emergency Bypass Detection Kit (EBDK)

1. Provide a means to detect the loss of normal power and trigger special-purpose lighting presets.
2. Emergency Bypass Detection enclosures shall support 100V to 277V configurations
3. EBDK enclosures shall be field configurable for single-phase, bi-phase, and three-phase operation without the need for additional components.
4. The Emergency Bypass Detection Kit shall be completely pre-wired by the manufacturer. The contractor shall provide input feed and control wiring.
5. All control wire connections shall be terminated via factory provided connectors.
6. The Bypass Detection Kit shall be UL and Section 924 Listed for interaction with similarly listed dimming and switching panels.
7. Quantity: As shown on drawings.
8. Acceptable product:
  - a. ETC Emergency Bypass Detection Kit
  - b. Strand Phase Loss Sense Panel

## 2.09 MISCELLANEOUS

A. Stage Edge Safety Light

1. Lamp: SKL Square Krystal-Lite (waterproofed) on 6" spacing
2. Bulb Type: Red, white at the center
3. Housing: SC Channel; .41" profile, "U" channel for inlayed/surface design - field verify all dimensions.
4. Coordinate installation with Electrical.

5. Transformer: Provide appropriately sized transformer for custom length. Stage edge light to be controlled through the dimming system, provide any DMX interface as needed.
6. Overall assembly is to be UL listed.
7. Quantity: As shown on drawings
8. Acceptable Product:
  - a. Vista Light Strip (with SKL lamps)
  - b. Future-Light Edge Light
  - c. Tivoli Stage Edge
- B. LED Stage Electric Work Lights
  1. Provide a high output LED work light capable of clamping onto the top batten of the stage electrics.
  2. Construction: Heavy duty anodized extruded aluminum housing. All materials shall be corrosion resistant.
  3. Rating: 120/240 volts AC/DC operation.
  4. Cable: 36" Teflon leads encased in black fiberglass sleeving.
  5. Connectors: (1) male parallel blade
  6. Yoke: Rigid flat steel with locking dog tilt handle.
  7. Finish: All black enamel
  8. Provide with yoke and c-clamp hardware
  9. Quantity: (8)
  10. Acceptable product:
    - a. Altman LED Work Light
    - b. SSRC LED Work Light, 150W Warm White
- C. Rolling Safety Light
  1. Provide castered stand with safety caged compact fluorescent 100 watt equivalent lamp.
  2. Provide (1) 30' 12/3 cable terminating in a 20A U-ground connector. Mount cable hanger to stand.
  3. Quantity: (1) Custom Safety Light
  4. Acceptable product(s):
    - a. Altman 526/5-9 with listed accessories

## **2.10 PORTABLE LIGHTING FIXTURES AND ACCESSORIES**

- A. Provide and integrate the following equipment into the project.
  1. Theatrical Lighting Fixtures
    - a. The portable lighting fixtures shall connect and be controlled by the new theatrical lighting control system.
    - b. All fixtures shall be listed by UL or an OSHA approved NRTL.
    - c. Fixtures shall be constructed of rugged die cast aluminum with high impact knobs and handles unless otherwise noted.
    - d. Fixtures shall be provided with a black finish unless otherwise noted.
    - e. Fixtures shall have a rugged steel yoke with a positive locking clutch which will allow for a 300° body rotation.

- f. All fixtures shall be provided with color frame, power lead with mating grounded connector, safety cable, and c-clamp.
  - g. Fixtures shall be:
    - 1) Labeled with the Owner's mark and select numbering/labelling inventory scheme.
    - 2) Bench-focused, if necessary.
    - 3) Hung in the Owner's selected stock plot.
    - 4) Patched at the console.
- B. LED-type fixtures
  - 1. Provide (1) power pass-through and (1) DMX extension cable at 10 ft. length for each LED-type fixture included in the inventory.
  - 2. All LED-type fixtures shall support ANSI E1.11 DMX512-A and ANSI E1.20 RDM standards.
  - 3. All LEDs used in the product shall be high brightness and proven quality from established and reputable LED manufacturers.
  - 4. Manufacturer of LED emitters shall utilize an advanced production LED binning process to maintain color consistency.
- C. Fixtures – Type and Quantity
  - 1. White-only LED Profile
    - a. Provide a warm-white high-intensity LED illuminator with DMX controlled intensity;
    - b. Unit shall have a shutter assembly with (4) blades mounted in two or more planes. Shutter blades shall be warp and burnout resistant.
    - c. Unit shall have projector-like quality pattern imaging, sharp shutter cuts without halation, and allow for both hard and soft beam edges.
    - d. Unit shall have two accessory slots, a top-mounted quick release gel frame retainer, and a slot with sliding cover for motorized pattern devices or optional iris.
    - e. Unit shall be equipped with a 114V to 125V 60Hz internal power supply.
    - f. Provide power lead with twistlock connector.
    - g. LED emitters shall be documented to produce a 3200K beam with a minimum CRI of 90;
    - h. Provide the following quantity of lens tubes:
      - 1) (10) 19°;
      - 2) (10) 26°;
      - 3) (20) 36°;
    - i. Quantity: XX
    - j. Acceptable product:
      - 1) Electronic Theatre Controls Source 4WRD II Gallery
        - a) Provide with (1) 10' power extension cable in lieu of power pass-thru cable with each fixture
        - b) Provide (1) 10' network cable in lieu of a DMX extension cable with each fixture
        - c) Provide (1) RJ45 to DMX male adapter, (1) RJ45 to DMX female adapter and one (1) RJ45 DMX terminator per (4) fixtures
      - 2) Strand Lighting LEKO LED TWW

- 3) Chauvet Ovation ED-260WW
2. Color-changing LED Profile
  - a. Provide an RGBL color mixing high-intensity LED illuminator with DMX controlled intensity and color;
  - b. Unit shall have a shutter assembly with (4) blades mounted in two or more planes. Shutter blades shall be warp and burnout resistant;
  - c. Unit shall have two accessory slots, a top-mounted quick release gel frame retainer, and a slot with sliding cover for motorized pattern devices or optional iris.
  - d. Unit shall have projector-like quality pattern imaging, sharp shutter cuts without halation, and allow for both hard and soft beam edges;
  - e. Unit shall operate at 100V to 240V 50/60 Hz and utilize an internal power supply;
  - f. Provide power lead with twistlock connector;
  - g. Unit shall support power and DMX in and thru connections.
  - h. Provide the following quantity of lens tubes:
    - 1) (12) 19°;
    - 2) (18) 26°;
    - 3) (12) 36°;
  - i. Quantity: (XX)
  - j. Acceptable product:
    - 1) ETC ColorSource Spot V
    - 2) Strand Lighting LED PLE
3. Color-changing LED Zoom-style Profile
  - a. Provide an RGBL color mixing high-intensity LED illuminator with DMX controlled intensity and color;
  - b. Unit shall have a shutter assembly with (4) blades mounted in two or more planes. Shutter blades shall be warp and burnout resistant;
  - c. Unit shall have two accessory slots, a top-mounted quick release gel frame retainer, and a slot with sliding cover for motorized pattern devices or optional iris.
  - d. Unit shall have projector-like quality pattern imaging, sharp shutter cuts without halation, and allow for both hard and soft beam edges;
  - e. Unit shall operate at 100V to 240V 50/60 Hz and utilize an internal power supply;
  - f. Provide power lead with twistlock connector;
  - g. Unit shall support power and DMX in and thru connections;
  - h. Unit shall utilize an integral 25° -50° adjustable lens assembly;
  - i. Quantity: (30)
  - j. Acceptable product:
    - 1) ETC ColorSource Spot jr Deep Blue
    - 2) Strand Lighting Acclaim LED Zoomspot
    - 3) Chauvet Ovation E-2 FC
4. Color-changing LED Wash
  - a. Provide an RGBL color mixing high-intensity LED illuminator with DMX controlled intensity and color;

- b. Unit shall have an accessory slot with a top-mounted quick release gel frame retainer.
  - c. Unit shall operate at 100V to 240V 50/60 Hz and utilize an internal power supply.
  - d. Provide power lead with twistlock connector;
  - e. Unit shall support power and DMX in and thru connections.
  - f. Provide (1) 5-pin XLR terminator for every (5) fixtures
  - g. Provide with (6) barn door assemblies and floor-stand yokes with base.
  - h. Quantity (56)
  - i. Acceptable product:
    - 1) ETC ColorSource V Fresnel
    - 2) Strand Lighting Acclaim LED Fresnel
    - 3) Chauvet Ovation F-915FC
5. LED Cyclorama Fixture
- a. Provide a four (4) color mixing high-intensity LED illuminator with DMX controlled intensity and color;
  - b. Unit shall operate at 100V to 240V 50/60 Hz and utilize an internal power supply;
  - c. Provide power lead with twistlock connector;
  - d. Unit shall support power and DMX in and thru connections;
  - e. Provide trunnion with c-clamps hanging bracket mounting for each fixture if manufacturer does not provide yoke-mounting hardware;
  - f. Acceptable product and quantity:
    - 1) Altman Cyc 200 LED RGBA (9)
    - 2) Strand Lighting CODA LED Cyc (9)
    - 3) ETC ColorSource Cyc (18)
    - 4) Chauvet Ovation CYC 1 FC (18)
    - 5) Vari-lite Acclaim Cyc (18)
6. LED Follow Spots - Auditorium
- a. Provide a 6000K cool white high-intensity LED illuminator with DMX controlled intensity.
  - b. Construction: sheet metal housing with black finish. All materials will be corrosion resistant.
  - c. Rating: Long life LED source
  - d. High performance quartz condenser optical system.
  - e. 100% closing iris with black plate follower in a removable cassette.
  - f. Built in flicker free power supply.
  - g. "A" size double gobo holder on slide changer.
  - h. 6-way boomerang color changer fitted with removable filter frames.
  - i. Heavy duty adjustable yoke.
  - j. Heavy duty stand
  - k. Special hanging points at the rear of the unit.
  - l. Set of tools and first emergency spare parts.
  - m. Quantity: (2)

- n. Acceptable Products:
  - 1) Robert Juliat – OZ 600W LED
  - 2) Ushio SAI 500
  - 3) Canto Astro 600
- D. Cables and Accessories
  - 1. Extension Cables:
    - a. Provide extension cables for extending pigtail or wall box circuits to lighting instrument.
    - b. Provide cable and connectors which meet or exceed the quality of cables and connectors set forth in this specification.
    - c. Provide each cable with Velcro cable tie.
    - d. Provide extension cable assemblies consisting of 12-gauge, 3 conductor flexible cable and 20A rated male and female grounded twist-lock connectors.
    - e. Quantity:
      - 1) (12) @ 5 ft.
      - 2) (12) @ 10 ft.
      - 3) (6) @ 25 ft.
      - 4) (6) @ 50 ft.
    - f. Acceptable Products:
      - 1) TMB & Associates ProPower
      - 2) Lex Products PowerFLEX
      - 3) Or approved equal
  - 2. Adapter Cables
    - a. Provide adapter cables for extending pigtail or wall box circuits to lighting instrument.
    - b. Provide cable and connectors which meet or exceed the quality of cables and connectors set forth in this specification.
    - c. Provide each cable with Velcro cable tie.
    - d. Provide extension cable assemblies consisting of 12-gauge, 3 conductor flexible cable and 20A rated male Edison connectors and female grounded twist-lock connectors.
    - e. Quantity:
      - 1) (6) @ 1ft. with Male Edison and female twist-lock connectors
      - 2) (6) @ 1ft. with Male twist-lock and female Edison connectors
    - f. Acceptable Products:
      - 1) TMB & Associates ProPower
      - 2) Lex Products PowerFLEX
      - 3) Or approved equal
  - 3. Two-fers:
    - a. Provide “Y” cables to connect two fixtures to a single receptacle.
    - b. Provide cable and connectors, which meet or exceed the quality of cables and connectors set forth in this specification.
    - c. Provide adapter assemblies consisting of 12-gauge, 3 conductor flexible cable and connectors of same specifications found in this section.



- d. Quantity: (20)
- e. Acceptable Products:
  - 1) TMB & Associates ProPower
  - 2) Lex Products PowerFLEX
  - 3) Or approved equal
- 4. DMX-512 cable
  - a. Provide DMX-512 cables for connecting lighting consoles, moving lights, or other DMX controlled accessories to the Network Nodes.
  - b. Connectors shall be Neutrik 5-pin.
  - c. Provide 24AWG two twisted pair data cable.
  - d. Insulation: polyethylene.
  - e. Nominal Impedance: 100 ohms.
  - f. Nominal Velocity of Prop.: 78%.
  - g. Capacitance between conductors: 12.5 pF/ft.
  - h. Quantity:
    - 1) (12) 5' DMX Cable
    - 2) (12) 10' DMX Cable
    - 3) (6) 25' DMX Cable
    - 4) (6) 50' DMX Cable
  - i. Acceptable Products:
    - 1) TMB & Associates ProPlex
    - 2) Lex Products PowerFLEX
    - 3) Or approved equal
- 5. Flexible Category 5e Cable/NET Cable:
  - a. Provide extra rugged, flexible control cable (Ethernet) for connection of NET stations to portable Network Nodes.
  - b. Cable to be 4-pair, double shielded, low-capacitance.
  - c. Conductors: 24 AWG tinned, annealed copper stranded 7 x 0.16.
  - d. Connector: Provide with EtherCon connector by Neutrik
  - e. Assembly: pairs cabled with Kevlar strength member.
  - f. Shield: (inner) aluminum/Mylar, 100% coverage (outer) tinned copper braid, 80% coverage.
  - g. Conductivity: 15ohms per 100 meters @ 20C.
  - h. Impedance: 100 ±15 ohms 1-100 MHz
  - i. Quantity:
    - 1) (8) 3' Ethernet Cable
    - 2) (8) 10' Ethernet Cable
    - 3) (4) 25' Ethernet Cable
  - j. Acceptable Products:
    - 1) TMB & Associates ProPlex
    - 2) Lex Products PowerFLEX
    - 3) Or approved equal

6. XLR DMX Terminator
  - a. Provide XLR DMX male terminator
  - b. Connector shall be Neutrik 5-pin.
  - c. Termination resistance: 120 ohms +/- 10% between pins 2 and 3
  - d. Termination power capacity: 2 watts
  - e. Quantity: (12)
  - f. Acceptable Product
    - 1) ETC SGE 1507
    - 2) Lex Products DMX5P-TERM
7. Color Medium Sheets
  - a. Provide standard and high temperature (HT) color medium
  - b. Color medium shall be selected by Owner
  - c. Provide (24) full size sheets (20"x24") of HT color filter
  - d. Acceptable product:
    - 1) Lee Color Filters
    - 2) Rosco Color Filters
8. Pattern Templates (Gobos)
  - a. Provide eight (8) stainless steel image patterns.
  - b. Size and patterns shall be selected by the Owner.
  - c. Acceptable product(s):
    - 1) Rosco Stainless Steel Gobos
9. Pattern Template Holders
  - a. Provide stainless steel metal pattern holders with plastic pull ring
  - b. Quantity:
    - 1) (8) size A
    - 2) (8) size B
  - c. Acceptable product(s):
    - 1) City Theatrical 2150 and 2160 sandwich holders
    - 2) Electronic Theatre Controls 400PH-A and 400PH-B pattern holders
10. Side Arm Extensions
  - a. Provide side arms for extending the mounting point of theatrical fixtures beyond rigging pipes and handrails.
  - b. Side arm to consist of:
  - c. Hanging attachment for connection to 1.5" schedule 40 batten or handrail.
  - d. Pipe extension of 18" or 24" long
  - e. One or more sliding tees for attaching theatrical fixtures to pipe extension
  - f. Color: black
  - g. Quantity: (24)
  - h. Acceptable product:
    - 1) Altman Lighting 509-HD-24-1 Side Arm
11. Tie Line

- a. Product will be a cotton line with polyester core
  - b. The blend will be a diamond braid construction
  - c. Product will be Black in color
  - d. Product will be unglazed
  - e. Product will be 1/8" in diameter
  - f. Product will be on original spool or reel
  - g. Provide 1000'-0" spool
    - 1) Cut into 24" ties for dressing cable used in repertory plot
    - 2) Furnish the remainder of unused spool to Owner
  - h. Acceptable product:
    - 1) Rose Brand #4 Tie Line
12. Light Trees:
- a. Provide code rated parts to comprise a lighting tree.
  - b. Pipe and base will be furnished in black finish.
  - c. Provide six (6) light tree assemblies as follows:
  - d. Provide a 50lb. base NPT threaded to accept a typical 1-1/2" Schedule 40 pipe.
  - e. Provide a 10'-6" section of 1-1/2" Schedule 40 pipe (threaded on both ends) with plastic vinyl end cap.
  - f. Provide total eight (8) – 18" sliding tee side arms for each tree.
  - g. Provide total three (3) – 35 pound sandbags for each tree.
  - h. Acceptable product:
    - 1) Base: Altman B50.
    - 2) Or approved equal

## **PART 3 - EXECUTION**

### **3.01 GENERAL**

- A. Coordinate incorporation of the Work specified herein with other project work so as to facilitate a cohesive final product.
- B. The installation recommendations contained within the Telecommunications Distribution Methods Manual are mandatory minimum standards and requirements.
- C. Mount equipment and enclosures plumb and level.
- D. Permanently installed equipment to be firmly and safely held in place.
- E. Verify all locations of equipment in all rooms with Owner's Representative, Owner, and Consultant.

### **3.02 INSTALLATION OF CABLE AND WIRING**

- A. Verify installation of electrical work for this scope and all associated equipment with the overall Electrical installation. Provide all necessary equipment, including mounting hardware, for complete connection of power system wiring.
- B. Verify installation of power and ground wiring to equipment. Power and ground wiring will terminate inside of equipment and/or junction boxes and be hardwired to ground buss and circuit breaker to ensure uninterrupted operation.
- C. All control wiring will be executed in adherence to ANSI standards including the following:

1. Isolate cables carrying signals at different levels and separate to restrict interaction.
2. Keep wiring separated into three groups of conduit provided for control circuits, power circuits (up to 50 Amps), and feeder circuits (above 50 Amps).
3. Isolate all wiring, except for safety ground wiring, from conduit ground.
4. Take such precautions as are necessary to prevent and guard against electromagnetic and electrostatic interference in other technical systems (such as sound and communications systems) in the facility. Where possible all devices and wiring will be enclosed in a shielded environment. Take care not to use shields (conduits) and grounds as current carrying return paths for lamp and relay coil commons. All ground references are to be made to the building electrical system ground.
5. Label unused wiring provided for spares or future systems and terminate at screw terminal strips.
6. All joints and connections will be made with resin-core solder or with ratchet jaw crimp type mechanical connectors. Connect all circuits electrically in phase using same wire color code for similar circuits throughout the project.
7. Install cable in a manner to adhere to manufacturer's specifications for maximum cable pulling tension, minimum bend radius, and restrictions.
8. Provide appropriate support at all horizontal-to-vertical transitions in order to keep the weight of the cable from degrading at the point of transition.
9. If a J-hook or trapeze system is used to support cable bundles, all horizontal cables shall be supported at a maximum of 48-inch (1.2 meter) intervals. At no point shall the cables rest on light fixtures, acoustic ceiling grids, panels, conduits, sprinkler pipe, water pipe and/or HVAC system ducting.
10. Cable shall be installed above fire-sprinkler systems and shall not be attached to the system or any ancillary equipment or hardware. The cable system and support hardware shall be installed so that it does not obscure any valves, fire alarm conduit, boxes, or other control devices
11. Cables shall not be attached to ceiling grid or lighting fixture wires. Where support for horizontal cable is required, install appropriate carriers to support the cabling.
12. Cables shall be identified by a self-adhesive machine label in accordance with the System Documentation Section of this specification and ANSI/TIA/EIA-606-A. The cable label shall be applied to the cable behind the faceplate on a section of cable that can be accessed by removing the cover plate.
13. Unshielded twisted pair cable shall be installed so that there are no bends smaller than four times the cable outside diameter at any point in the run and at the termination field.
14. Provide splice free wiring and cabling from origination to destination. Cables shall be installed in continuous lengths from origin to destination (no splices). Properly designed transition points, or consolidation points are not considered 'splice' points.
15. Cover edges of cable and wire pass-through holes in chassis, housings, boxes, etc., with rubber grommets or Brady GRNY nylon grommetting.
16. Any cable damaged or exceeding recommended installation parameters during installation shall be replaced prior to final acceptance at no cost to the Owner.

### **3.03 INSTALLATION OF EQUIPMENT**

- A. Take appropriate precautions against electrostatic discharge (ESD) when installing electronic equipment.
- B. Equipment to be installed in new condition, free of damages, scratches, dents, etc.

- C. Provide adequate ventilation in cabinet mounted equipment to maintain operating temperatures within range recommended by Manufacturer.
- D. All equipment will be installed in compliance with applicable Local and National Codes and Regulations.
- E. Equipment shall be installed in accordance with Manufacturer's requirements.
- F. Install lighting fixtures using standard industry practices. All lamps, lenses, and reflectors will be installed free of dirt, dust, and finger smudges. Do not use bare hands when handling conventional tungsten lamps. Ensure that a safety cable is properly applied with each fixture.
- G. Install lighting instruments to the standard house hang or repertory plot as directed by Consultant. Contractor shall document location of each type of distribution device and circuiting as part of as-built documents on plot. Provide pdf copy of plot to Consultant and Owner. Provide (2) full size printed copies of plot to Owner.

### **3.04 CONTRACTOR COMMISSIONING**

- A. Prior to energizing or testing the System ensure the following:
  - 1. Physical installation is complete.
  - 2. Products are installed in proper and safe manner according to Manufacturer's requirements.
  - 3. Dust, debris, solder splatter, etc. is removed.
  - 4. Cable is dressed, routed, and labeled; connections are consistent with regard to polarity.
  - 5. Temporary facilities and utilities have been properly disconnected and removed.
  - 6. Broken work, including glass, raised flooring and supports, ceiling tiles and supports, walls, doors, etc. have been replaced or properly repaired, and debris cleaned up and discarded. The jobsite shall be broom clean.
- B. Contractor shall:
  - 1. Retain the services of a Manufacturer certified technician to check the installation and ensure its proper operation. No part of the Theatrical Lighting System may be energized before this technician has checked and approved the System installation.
  - 2. Test all lighting load circuits for the following:
    - a. Continuity
    - b. Nominal voltage
    - c. Polarity
    - d. Accuracy to the Distribution Schedule as enumerated in the drawings.
  - 3. Test controls wiring for the following:
    - a. Appropriate wire types and quantities
    - b. Control wire distance from source
    - c. Terminations meet Manufacturer requirements
- C. The following identifies some, but not all, of the commissioning tasks of the commissioning team. This list is not intended to be comprehensive and should be considered a general guideline for the Contractor without a defined commissioning process statement:
  - 1. Program all power distribution panels
  - 2. Setup and program all network control devices
  - 3. Setup and initial programming of control console
  - 4. Setup and initial programming for all architectural control devices

5. Program all emergency lighting control devices

### **3.05 FINAL OBSERVATION & TESTING**

- A. Upon completion of installation, initial adjustments, tests and measurements specified in Part 3, and submission and review of the results, a final inspection and test will be observed by the Consultant.
- B. Testing will include operation of each major system and any other components deemed necessary. Contractor will assist in this testing and provide all test equipment noted below. Contractor shall provide at least two (2) technicians available for the entire testing period (day and night), to assist in tests, adjustments, and final modifications. Testing process is estimated to take a minimum of one (1) day.
- C. Provide the following test gear:
  1. Circuit Tester with adapters for all connectors present in the system.
  2. Multimeter capable of measurements up to 600V AC/DC, 10A DC, and 2MOhms
  3. DMX Tester
  4. Industrial Ethernet Tool capable of testing signal continuity and distance from source
- D. The following procedures will be performed on each System:
  1. Observation of the physical installation including labeling, mounting, and finish of all equipment and components which are a part of the System.
  2. Functional testing of all control devices and devices under control within the System.
  3. Review of programming and standard settings for all control interface devices.
  4. Load circuit verification.
  5. Control circuit verification.
  6. Other tests on equipment or systems deemed appropriate.
- E. The Consultant will provide the Owner with a listing describing any incomplete or otherwise deficient items determined as part of the testing process. Where further adjustment or work becomes evident during testing, the Contractor is to continue work until the System is complete.

### **3.06 INSTRUCTION OF OWNER PERSONNEL**

- A. Provide operations and service training on all equipment incorporated in the System.
- B. Training shall not be conducted until final observation and testing is completed by the Consultant, unless otherwise directed by the Owner.
- C. Provide (16) hours of training. Training time shall be conducted in multiple sessions, with each session not to exceed four hours. Training shall be conducted in accordance with Owner's schedule.
  1. Six months after completion of initial training, schedule an additional (4) hours with Owner for review of systems and equipment operation.
- D. The major equipment components and subject matter are as follows (advisory percentage of overall time allocated):
  1. Power Distribution System (20%)
    - a. Basic testing and control
    - b. Normal and emergency operations
    - c. Programming memory
    - d. Software configurations and upgrades

- e. Troubleshooting.
- 2. Control Console (40%)
  - a. Operational training, including offline or remote-access software
  - b. Patching and programming
  - c. Fixture integration
  - d. Peripheral hardware
  - e. Applications interface for retrieving information from the control console
  - f. Troubleshooting
  - g. Upgrades
- 3. Architectural Controls (20%)
  - a. Part of training will be to establish programmed looks for the performance areas with the end-user. The Contractor shall provide all equipment to establish DMX values for preset looks.
  - b. Snapshotting preset onto DMX controller
  - c. Preset recall operation
  - d. Normal operations (e.g., console arbitration, time-clock controlled events, etc.)
  - e. Troubleshooting.
- 4. Theatrical Lighting Fixtures and Accessories (20%)
  - a. Hang and focus
  - b. Cabling and circuiting
  - c. Setup and DMX addressing
  - d. Troubleshooting
- E. Training Schedules
  - 1. Training should be assumed to take place on the project site.
  - 2. Training should be scheduled to be non-overlapping.
  - 3. Actual training schedule shall be by agreement with Owner.
  - 4. In the event that a portion of the training time is occupied in troubleshooting the equipment installation, then the training time shall be extended an equal amount of time.
- F. Submit an outline of the course with sample instructional aides for approval thirty (30) days prior to scheduled instruction sessions to architect and architect's consultant.
- G. Following discussions with Owner, provide a Training submittal 2-4 weeks prior to first training. Submittal shall:
  - 1. Include a separate page/entry for every training session.
  - 2. Indicate date, time, and approximate length of training session.
  - 3. Indicate person(s) conducting training.
  - 4. Indicate whether training will be video recorded.
  - 5. Intended curriculum and most appropriate attendees (e.g., technician, operations, IT, etc.)
  - 6. Include signature and title lines for:
    - a. Owner acknowledging and accepting training schedule. Include both an Accepted and Rejected box. An alternate schedule time should be suggested by the Owner in the event the schedule is rejected.
    - b. Countersigning by trainer indicating that training actually occurred.

- c. All persons attending training. Where attendees do not stay for the entire session, this should be noted on the form and initialed by Owner's representative attending training.
- d. Owner's representative attending training at the end of the session shall initial that:
  - 1) Training Occurred.
  - 2) Training Materials were provided and left with Owner
  - 3) Training was not interrupted or shortened by equipment or system troubleshooting. If it is, then there should be a line where Owner and Contractor can indicate when make-up training will be provided and how long it should be.
  - 4) Training was generally sufficient for the proposed curriculum.
- 7. Include Notes section for Owner and Contractor to note any issues during training (areas requiring further development, etc.)
- H. Following training occurrence, submit completed training records no later than 5 days following end of training. When training is conducted over a period of weeks, completed training submittals shall be consolidated into a single submittal and submitted every 2 weeks.

### **3.07 EVENT ATTENDANCE**

- A. Contractor shall attend the first facility use or event as directed by the Owner.
  - 1. Event Attendance includes the following requirements:
    - a. Attendance shall begin at the first crew call and conclude when the crew is released. During these events perform such tasks (e.g., assistance with patching, programming, troubleshooting cabling problems, etc.) as requested by User. Tasks shall be strictly assistance, not operation.
    - b. Event support personnel shall be a technician associated with the original installation and commissioning.
    - c. In the event that the system is used prior to final acceptance, attendance in support of system usage shall not be construed as acceptance or as event attendance.
  - 2. Coordinate these schedules with the Owner.

**END OF SECTION 11 6162**



**SECTION 11 6623  
GYMNASIUM EQUIPMENT**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Basketball backboards, goals, and support framing.
- B. Ballet Bars and Brackets
- C. Floor sleeves for net and goal posts.
- D. Wall mounted protection pads.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete floor slab to receive floor sleeves and anchors.
- B. Section 05 1200 - Structural Steel Framing: Structural members supporting basketball systems.
- C. Section 05 5000 - Metal Fabrications: Secondary structural members supporting gymnasium equipment.
- D. Section 09 6466 - Wood Athletic Flooring

**1.03 REFERENCE STANDARDS**

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023b.
- B. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2023).
- C. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. NFPA 101 - Life Safety Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- E. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth 2019.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Large Components: Ensure that large components can be moved into final position without damage to other construction.
- B. Electrically Operated Equipment: Coordinate location and electrical characteristics of service connection.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data showing configuration, sizes, materials, finishes, hardware, and accessories; include:
  - 1. Electrical characteristics and connection locations.
  - 2. Structural steel welder certifications.
  - 3. Manufacturer's installation instructions.
- C. Shop Drawings: For custom fabricated equipment indicate, in large scale detail, construction methods; method of attachment or installation; type and gage of metal, hardware, and fittings; plan front elevation; elevations and dimensions; minimum one cross section; utility requirements as to types, sizes, and locations.
- D. Erection Drawings: Detailed dimensional requirements for proper location of equipment and court layouts.
- E. Submit a copy of the latest UIL rules and regulations verifying compliance

- F. Samples: Submit samples of manufacturer's available range of colors, textures, and graphics. Accompanying the submittal described above, submit Samples of each sealant, each backing material, each primer, and each bond breaker proposed to be used
- G. Operating and maintenance data, for each operating equipment item.
- H. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

#### **1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified with minimum three years of experience.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver products to project site in manufacturer's original packaging with factory original labels attached.
- B. Store products indoors and elevated above floor; prevent warping, twisting, or sagging.
- C. Store products in accordance with manufacturer's instructions; protect from extremes of weather, temperature, moisture, and other damage.

#### **1.08 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Backboard and goal shall have a life-time replacement warranty against breakage.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Gymnasium Equipment:
  - 1. AALCO Manufacturing Company; [www.aalcomfg.com](http://www.aalcomfg.com).
  - 2. ADP Lemco, Inc.; [www.adplemco.com](http://www.adplemco.com).
  - 3. Arizona Courtlines, Inc; [www.arizonacourtlines.com](http://www.arizonacourtlines.com).
  - 4. Draper, Inc: [www.draperinc.com/sle](http://www.draperinc.com/sle).
  - 5. Performance Sports Systems: [www.perfsports.com](http://www.perfsports.com).
  - 6. Porter Athletic Equipment Company: [www.porterathletic.com](http://www.porterathletic.com).
  - 7. Sports Imports: [www.sportsimports.com](http://www.sportsimports.com)
  - 8. Substitutions: See Section 01 6000 - Product Requirements.

#### **2.02 GENERAL REQUIREMENTS**

- A. All equipment model numbers equal to Porter Equipment Co.
- B. See drawings for sizes and locations, unless noted otherwise.
- C. Where mounting dimensions or sizes are not indicated, comply with applicable requirements of the following:
  - 1. National Federation of State High School Associations (NFHS) sports rules.
  - 2. United States Olympic association rules for the sport.
- D. Provide mounting plates, brackets, and anchors of sufficient size and strength to securely attach equipment to building structure; comply with requirements of Contract Documents.
- E. Hardware: Heavy duty steel hardware, as recommended by manufacturer.
- F. Electrical Wiring and Components: Comply with NFPA 70; provide UL-listed equipment.
- G. Structural Steel Fabrications: Welded in accordance with AWS D1.1/D1.1M, using certified welders.

## 2.03 BASKETBALL

- A. Wall-Mounted Backstop Assemblies:
  - 1. Framing: Stationary framing.
    - a. Side Court; model 00312-R10H
  - 2. Height Adjuster: Each backstop shall be provided with line height adjustment unit model 900 that raises or lowers assembly by 2 feet to adjust goal height from 8'-0" to 10'-0" A.F.F..
  - 3. Framing Color: Manufacturer's standard.
- B. Ceiling-Suspended Backstop Assemblies:
  - 1. Framing: Center strut; forward folding; rear braced framing
    - a. Main Court; model 90917-28
  - 2. Folding Control System: Electric hoist; Provide each retractable backstop with a model 706 1/2 H.P. for backstops under 28' or model 707 3/4 H.P. winch on backstops 28' & over. Winch and safety strap model 797 and key switch model 791. Refer to Section 08 7100 – Door Hardware for key cylinder.
  - 3. Height Adjuster: Each backstop shall be provided with line height adjustment unit model 900 to raise/lower assembly by 2 feet to adjust goal height from 8'-0" to 10'-0" A.F.F..
  - 4. Framing Color: Manufacturer's standard.
- C. Backboards: Model 00208-300, 1/2" Tempered glass, rectangular shaped.
  - 1. Frame: Brushed aluminum edge, steel mounting.
  - 2. Dimensions: 42 inches high by 72 inches wide
  - 3. Markings: Integrally manufactured.
  - 4. Provide model 00-326 safety padding for bottom edge of backboard.
  - 5. Provide mounting kit.
  - 6. Color: As selected from manufacturer's standard selection.
- D. Goals: Model 00252-500 steel rim, mounted to backboard, with attached nylon anti-whip net; complete with mounting hardware.
  - 1. Net Attachment Device: Tube-tie.
  - 2. Finish: Powder coat orange.

## 2.04 BALLET BARS AND BRACKETS

- A. Ballet Bars and Brackets: Fixed brackets with round arm and wood bar where shown on the drawings.
  - 1. Bar:
    - a. 1-3/4" diameter Red Oak
  - 2. Brackets:
    - a. 9" deep, non-adjustable chrome bracket
    - b. Spacing as shown on the drawings but no more than 96" on center.
    - c. Coordinate spacing and mounting with mirrors before ordering any materials.
    - d. Coordinate mounting height with Owner before installation
  - 3. Manufacturer
    - a. CWF Flooring, Inc.: [www.cartwheelfactory.com](http://www.cartwheelfactory.com)
    - b. Substitutions: See Section 01 6000 - Product Requirements.

## 2.05 FLOOR-MOUNTED EQUIPMENT

- A. Floor Sleeves for Posts: Metal sleeve, with latch cover, cast into concrete subfloor to hold poles for volleyball nets; installed flush with finish floor surface.
  - 1. Latch Cover: Brass, round; tamper resistant lock with key.
  - 2. Sleeve: Steel.
  - 3. Round Pole Diameter: 3 1/2 inches.
  - 4. Depth of Sleeve: 9 inches from floor surface to bottom, including latch cover.
  - 5. Locate as shown on the drawings;

- a. At wood gymnasium floors provide model 00870-200

## **2.06 WALL PADDING**

- A. Wall Padding: Model 00570-1 with foam filling bonded to backing board, wrapped in covering; each panel fabricated in one piece.
  - 1. Surface Burning Characteristics: Flame spread index (FSI) of 25 or less, smoke developed index (SDI) of 450 or less, Class A, when tested in accordance with ASTM E84 as a complete panel.
  - 2. Flammability: Comply with NFPA 286.
  - 3. Covering: Vinyl-coated polyester fabric, mildew and rot resistant; stapled to back of board.
    - a. Color: As selected from manufacturer's standard range.
    - b. Texture: Embossed leather-look.
    - c. Fabric Weight: 14 oz/sq yd.
  - 4. Foam: Open cell polychloroprene (Neoprene) 6 pcf nominal density.
  - 5. Foam Thickness: 2 inches.
  - 6. Backing Board: Oriented strand board.
    - a. Thickness: 7/16 inch.
    - b. Surface Burning Characteristics: Flame spread index (FSI) of 25 or less, smoke developed index (SDI) of 450 or less, Class A, when tested in accordance with ASTM E84.
  - 7. Panel Dimensions: 24 inches wide by 70 inches long, no nailing margins.
  - 8. Mounting: Removable; Model 00347-100 and 00347-300 mounting hardware. Set wall pads 2" above floor elevation
- B. Specially Shaped Padding: Same construction as standard padding; custom fabricate to fit irregularly shaped members, areas, and protrusions in gymnasium as indicated; provide padding for:
  - 1. Wall corners.
  - 2. Hand Rail and Guard Rail
- C. Round Column Padding: Same construction as standard padding; made to fit; with grommet strip on each long side of pad, provide laces.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Take field measurements to ensure proper fitting of work. If taking field measurements before fabrication will delay work, allow for adjustments within recommended tolerances.
- B. Inspect areas and conditions before installation, and notify Architect in writing of unsatisfactory or detrimental conditions.
- C. Do not proceed with this work until conditions have been corrected; commencing installation constitutes acceptance of work site conditions.
- D. Verify that electrical services are correctly located and have proper characteristics.

### **3.02 INSTALLATION**

- A. Install in accordance with Contract Documents and manufacturer's instructions.
- B. Coordinate installation of inserts and anchors that must be built in to flooring or subflooring.
- C. Install equipment rigid, straight, plumb, and level.
- D. Secure equipment with manufacturer's recommended anchoring devices.
- E. Install wall padding securely, with edges tight to wall and without wrinkles in fabric covering.
- F. Separate dissimilar metals to prevent electrolytic corrosion.

### **3.03 ADJUSTING**

- A. Verify proper placement of equipment.

- B. Verify proper placement of equipment anchors and sleeves, and use actual movable equipment to be anchored if available.
- C. Adjust operating equipment for proper operation; remove and replace equipment causing noise or vibration; lubricate equipment as recommended by manufacturer.

**3.04 CLEANING**

- A. Remove masking or protective covering from finished surfaces.
- B. Clean equipment in accordance with manufacturer's recommendations.

**3.05 PROTECTION**

- A. Protect installed products until Date of Substantial Completion.
- B. Replace damaged products before Date of Substantial Completion.

**END OF SECTION**



**SECTION 11 6843  
SCOREBOARDS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Single-sided LED scoreboards, timers and clocks.

**1.02 REFERENCES**

- A. Standard for Electric Signs, UL-48, 14th Edition.
- B. Standard for Control Centers for Changing Message Type Signs, UL-1433, 4th Edition.
- C. Standard for CAN/CSA C22.2 No. 207-M89.
- D. Federal Communications Commission Regulation Part 15.
- E. National Electric Code.

**1.03 SUBMITTALS**

- A. Product data: Submit manufacturer's product illustrations, data and literature that fully describe the scoreboards and accessories proposed for installation.
- B. Shop drawings: Submit mechanical, electrical drawings, and Structural Drawings sealed by an Engineer familiar with scoreboard design and licensed in the state of Texas.
- C. Shop drawing sheets that include engineering information designed by the Contractor's Delegated Design Engineer shall be signed and sealed in accordance with the Texas Engineering Practice Act. Sheets that do not provide information designed by the Contractor's Engineer do not require being signed and sealed. Calculation packages require a signed and sealed cover sheet only. Any submittals requiring to be signed and sealed that are received without the signature and seal will be rejected without review.
- D. Maintenance data: Submit manufacturer's installation, operation, and maintenance manuals.

**1.04 DELIVERY, STORAGE, AND HANDLING**

- A. Product delivered on site.
- B. Scoreboard and equipment to be housed in a clean, dry environment.

**1.05 PROJECT CONDITIONS**

- A. Environmental limitations: Do not install scoreboard equipment until mounting structure is secure and concrete has ample time to cure.
- B. Field measurements: Verify position and elevation of structure and its layout for scoreboard equipment. Verify dimensions by field measurements.
- C. Verify mounting structure is capable of supporting the scoreboard's weight and wind load in addition to the auxiliary equipment.
- D. Installation may proceed within acceptable weather conditions.

**1.06 QUALITY ASSURANCE**

- A. Source Limitations: Obtain each type of scoring or related equipment through one source from a single manufacturer.
- B. ETL listed to UL Standards 48 and 1433.
- C. NEC compliant.
- D. FCC compliant.
- E. ETL listed to CAN/CSA 22.2.

**1.07 WARRANTY**

- A. Provide 5 years of no cost parts exchange including standard shipping on electronics parts and radios due to manufacturing defects.

- B. Provide toll-free service coordination.
- C. Provide technical phone support during manufacturer's business hours.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURER**

- A. Daktronics, Inc.: [www.daktronics.com](http://www.daktronics.com).
- B. The Spectrum Corporation: [www.spectrumscoreboards.com](http://www.spectrumscoreboards.com).
- C. Nevco Scoreboard Company: [www.nevcoscoreboards.com](http://www.nevcoscoreboards.com).
- D. Trans-Lux/Fair-Play: [www.fair-play.com](http://www.fair-play.com).
- E. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 DESIGN REQUIREMENTS**

- A. Provide labor, material, equipment and supervision necessary to complete installation of pre-engineered Scoreboard including, but not limited to the following: concrete foundation/piers (for freestanding scoreboards), steel substructure, and Scoreboard support structure. This scope is a performance-based specification. The scope includes all design and installation as required for a complete installation. A full copy of the geotechnical report copy has been included in the project manual. Design shall comply with all applicable codes and accessibility regulations.
- B. Design: Conform to AISC Steel Construction Manual and AA Aluminum Design Manual.
- C. Applicable Codes: Design and workmanship shall be in accordance with the applicable building code.
- D. Design Loads:
  - 1. Wind Loads: Applicable building code.
  - 2. Snow Loads: Applicable building code.
  - 3. Seismic Loads: Applicable building code.
  - 4. Handrail and Guardrail: 250 lbs. concentrated in any direction.
- E. Shop Connections: Welded and capable of carrying stress put upon them.
- F. Welding: AWS D1.1.
- G. Concrete Foundations: Manufacturer shall design concrete foundation based on applicable loads and geotechnical values provided in the Geotechnical Report. Concrete foundations shall be installed as specified in Section 03 3000.

### **2.03 FOOTBALL SCORE BOARDS - HIGH SCHOOL**

- A. Basis of Design: Daktronics FB-2028 single-sided football scoreboard displays period time to 99:59, HOME and GUEST scores to 99, DOWN/TO GO/BALL ON/QTR (quarter) information, and T.O.L. (time outs left) to nine. Arrows indicate possession. During the last minute of the period, the clock displays time to 1/10 of a second.
- B. Scoreboard
  - 1. General information
    - a. Dimensions: 10'-0" (3.05 m) high, 36'-0" (10.97 m) wide, 0'-8" (203 mm) deep.
    - b. Base weight: 1460 lb (662 kg) with vinyl captions - options may increase weight.
    - c. Base power requirement:
      - 1) Top section: 600 W with vinyl captions - options may increase wattage.
      - 2) Bottom section: 600 W with vinyl captions - options may increase wattage.
    - d. Color: provide over 150 colors to choose from.
  - 2. Construction
    - a. Alcoa aluminum alloy 5052 for excellent corrosion resistance.
    - b. Scoreboard back, face, and perimeter: 0.063" (1.60 mm) thick.
    - c. Scoreboard top and bottom: 0.125" (3.18 mm) thick.
  - 3. Digits & Indicators



- a. LED color:
  - 1) Game information digits Amber, team information digits Amber.
- b. HOME, GUEST, and clock digits: 36" (914 mm) high.
- c. DOWN, TO GO, BALL ON, and QTR digits: 24" (610 mm) high.
- d. T.O.L. digits: 18" (457 mm) high.
- e. Seven bar segments per digit.
- f. PanaView® LED digit technology.
- g. All digits and indicators are sealed front and back with weather-tight silicone gel.
- 4. Captions
  - a. Vinyl applied directly to scoreboard face.
  - b. HOME and GUEST captions: 15" (381 mm) high.
  - c. DOWN, TO GO, BALL ON, and QTR captions: 14" (357 mm) high.
  - d. T.O.L. captions: 12" (305 mm) high.
  - e. Color: standard white or others available upon request.
- 5. Accessory Equipment
  - a. Programmable Team Name Message Centers (TNMCs) - add 140 lb (63 kg) and 300 W.
  - b. Backlit captions - add 180 lbs (82 kg) and 1020 W.
  - c. One 36.5" (927 mm) high, 115.25" (2.93 m) wide vinyl logo/sponsor area on display face.
  - d. Soccer captions on changeable panels.
  - e. Lacrosse/field hockey captions on changeable panels.
  - f. Horn.
  - g. Individual digit protective screens.
- C. Scoring Console
  - 1. Console is an All Sport 5000 controller.
  - 2. Scores multiple sports using changeable keyboard inserts.
  - 3. Controls multiple scoreboards and displays, including other All Sport 5000 controlled displays currently owned by customer.
  - 4. Recalls clock, score, and period information if power is lost.
  - 5. Console capable of automatically calculating and displaying DOWN & TO GO for each play.
  - 6. Runs Time of Day and Segment Timer modes.
  - 7. Console includes:
    - a. Rugged aluminum enclosure to house electronics.
    - b. Sealed membrane water-resistant keyboard.
    - c. 32-character LCD to verify entries and recall information currently displayed.
    - d. Power cord that plugs into a standard grounded outlet; 6 watts max.
    - e. Control cable to connect to the control receptacle junction box (wired system only).
    - f. Hand-held switch for main clock start/stop and horn.
    - g. Soft-sided carrying case.
  - 8. Accessory Equipment
    - a. Hard carrying case.

## **2.04 TIMING DISPLAY**

- A. Basis of Design: Daktronics TI-2003 single-sided timing display can be configured to count up or down from any preset number from 0 to 99.
- B. Display
  - 1. General information
    - a. Dimensions: 3'-0" (914 mm) high, 4'-0" (1.22 m) wide, 0'-8" (203 mm) deep.
    - b. Weight: 65 lb (29 kg).
    - c. Power requirement: 150 W.
    - d. Color: provide over 150 colors to choose from.

2. Construction:
  - a. Alcoa aluminum alloy 5052 for excellent corrosion resistance.
  - b. Display back, face, and perimeter: 0.063" (1.60 mm) thick.
3. Digits:
  - a. LED color Amber.
  - b. Clock digits: 30" (762 mm) high.
  - c. Seven bar segments per digit.
  - d. PanaView LED digit technology.
  - e. All digits are sealed front and back with weather-tight silicone gel.
- C. Scoring Console:
  1. Console is an All Sport 1600 controller.
  2. Scores multiple sports using changeable keyboard inserts.
  3. Controls multiple displays, including other All Sport 1600 controlled displays currently owned by customer.
  4. Recalls clock, score, and period information if power is lost.
  5. Runs Time of Day and Segment Timer modes.
  6. Console includes:
    - a. Rugged aluminum enclosure to house electronics.
    - b. Sealed membrane water-resistant keyboard.
    - c. 32-character LCD to verify entries and recall information currently displayed.
    - d. Power cord that plugs into a standard grounded outlet; 3 watts max.
    - e. Control cable to connect to the control receptacle junction box (wired system only).
    - f. Soft-sided carrying case.
  7. Accessory Equipment:
    - a. Hard carrying case.

## **2.05 BASEBALL SCOREBOARDS**

- A. Basis of Design: Daktronics BA-2125 single-sided baseball scoreboard displays HOME and GUEST team scores for up to 10 innings, total RUNS and HITS to 99 and ERR (errors) to nine for each team, AT BAT to 99, BALL to three, STRIKE to two, OUT to two, and H/E (hit or error) with field position number for the error. Scoreboard can show TIME or PITCH COUNT instead of AT BAT, as well as AT BAT or PITCH COUNT in place of H/E.
- B. Scoreboard:
  1. General information:
    - a. Dimensions: 7'-0" (2.13 m) high, 25'-0" (7.62 m) wide, 0'-8" (203 mm) deep.
    - b. Base weight: 875 lb (397 kg) with vinyl captions - options may increase weight.
    - c. Base power requirement: 900 W with vinyl captions - options may increase wattage.
    - d. Color: provide over 150 colors to choose from.
  2. Construction:
    - a. Alcoa aluminum alloy 5052 for excellent corrosion resistance.
    - b. Scoreboard back, face, and perimeter: 0.063" (1.60 mm) thick.
    - c. Scoreboard top and bottom: 0.125" (3.18 mm) thick.
  3. Digits:
    - a. LED color:
      - 1) Amber BALL, STRIKE, OUT and RUNS digits Red, all others Amber.
    - b. AT BAT, BALL, STRIKE, OUT, and H/E digits: 18" (457 mm) high.
    - c. Inning scores, RUNS, HITS, and ERR digits: 15" (381 mm) high.
    - d. Seven bar segments per digit.
    - e. PanaView LED digit technology.
    - f. All digits are sealed front and back with weather-tight silicone gel.
  4. Captions
    - a. Vinyl applied directly to scoreboard face.
    - b. HOME and GUEST captions: 12" (305 mm) high.

- c. AT BAT, BALL, STRIKE, OUT, and H/E captions: 10" (254 mm) high.
  - d. Inning numbers, RUNS, HITS, and ERR captions: 8" (203 mm) high.
  - e. Color: standard white or others available upon request.
- 5. Accessory Equipment
  - a. Vinyl striping applied around the scoreboard face.
  - b. Custom team name caption in place of HOME.
  - c. AT BAT caption on changeable panel (for upper-right scoreboard corner).
  - d. Individual digit protective screens.
- C. Scoring Console
  - 1. Console is an All Sport 5000 controller.
  - 2. Scores multiple sports using changeable keyboard inserts.
  - 3. Controls multiple scoreboards and displays, including other All Sport 5000 controlled displays currently owned by customer.
  - 4. Recalls clock, score, and period information if power is lost.
  - 5. Runs Time of Day and Segment Timer modes.
  - 6. Console includes:
    - a. Rugged aluminum enclosure to house electronics.
    - b. Sealed membrane water-resistant keyboard.
    - c. 32-character LCD to verify entries and recall information currently displayed.
    - d. Power cord that plugs into a standard grounded outlet; 6 watts max.
    - e. Control cable to connect to the control receptacle junction box (wired system only).
    - f. Hand-held switch for main clock start/stop and horn.
    - g. Soft-sided carrying case.
  - 7. Accessory Equipment
    - a. Hard carrying case.

## 2.06 SOFTBALL SCOREBOARDS

- A. Basis of Design: Daktronics BA-2005 single-sided baseball scoreboard displays HOME and GUEST team scores for up to nine innings, total RUNS to 99 for each team, AT BAT to 99, BALL to three, STRIKE to two and OUT to two. Scoreboard can show TIME instead of AT BAT with included caption panel.
- B. Scoreboard
  - 1. General information
    - a. Dimensions: 6'-6" (1.98 m) high, 20'-0" (6.10 m) wide, 0'-8" (203 mm) deep.
    - b. Base weight: 600 lb (272 kg) with vinyl captions - options may increase weight.
    - c. Base power requirement: 900 W with vinyl captions - options may increase wattage.
    - d. Color: provide over 150 colors to choose from.
  - 2. Construction
    - a. Alcoa aluminum alloy 5052 for excellent corrosion resistance.
    - b. Scoreboard back, face, and perimeter: 0.063" (1.60 mm) thick.
    - c. Scoreboard top and bottom: 0.125" (3.18 mm) thick.
  - 3. Digits
    - a. LED color:
      - 1) BALL, STRIKE, OUT and RUNS digits Amber, all others Red (-RA)
    - b. AT BAT/TIME, BALL, STRIKE, and OUT digits: 18" (457 mm) high.
    - c. Inning scores and RUNS digits: 15" (381 mm) high.
    - d. Seven bar segments per digit.
    - e. PanaView® LED digit technology.
    - f. All digits are sealed front and back with weather-tight silicone gel.
  - 4. Captions
    - a. Vinyl applied directly to scoreboard face; TIME on changeable caption panel.
    - b. HOME and GUEST captions: 12" (305 mm) high.

- c. AT BAT/TIME, BALL, STRIKE, and OUT captions: 10" (254 mm) high.
  - d. Inning numbers and RUNS captions: 8" (203 mm) high.
  - e. Color: standard white or others available upon request.
- 5. Accessory Equipment
  - a. Vinyl striping applied around the scoreboard face.
  - b. Custom team name caption in place of HOME.
  - c. Individual digit protective screens.
- C. Scoring Console
  - 1. Console is an All Sport 5000 controller.
  - 2. Scores multiple sports using changeable keyboard inserts.
  - 3. Controls multiple scoreboards and displays, including other All Sport 5000 controlled displays currently owned by customer.
  - 4. Recalls clock, score, and period information if power is lost.
  - 5. Runs Time of Day and Segment Timer modes.
  - 6. Console includes:
    - a. Rugged aluminum enclosure to house electronics.
    - b. Sealed membrane water-resistant keyboard.
    - c. 32-character LCD to verify entries and recall information currently displayed.
    - d. Power cord that plugs into a standard grounded outlet; 6 watts max.
    - e. Control cable to connect to the control receptacle junction box (wired system only).
    - f. Hand-held switch for main clock start/stop and horn.
    - g. Soft-sided carrying case.
  - 7. Accessory Equipment
    - a. Hard carrying case.

## 2.07 INTERIOR SCOREBOARDS

- A. Basis of Design: Daktronics BB-2105 single-sided basketball scoreboard displays period time to 99:59, HOME and GUEST scores to 199, PERIOD to nine and indicates possession and bonus. During the last minute of the period, scoreboard displays time to 1/10 of a second. Scoreboard can also score volleyball, wrestling and any sport requiring a clock, score and period function.
- B. Scoreboard
  - 1. General information
    - a. Dimensions: 4'-0" (1.22 m) high, 10'-0" (3.05 m) wide, 0'-6" (152 mm) deep.
    - b. Base weight: 150 lb (68 kg) - options may increase weight.
    - c. Base power requirement: 200 W - options may increase wattage.
    - d. Color: provide over 150 colors to choose from.
  - 2. Construction
    - a. All-aluminum construction.
    - b. Scoreboard back, face, and perimeter: 0.063" (1.60 mm) thick.
    - c. Cabinet withstands high-velocity impact from air-filled sports balls without the need for protective screens.
  - 3. Digits & Indicators
    - a. LED digit technology
      - 1) UniView® (UV) - enhanced digits with diffusant lenses over the LEDs that blend the light for a uniform bar look and 140° viewing angle.
    - b. Clock and score digits: 13" (330 mm) high.
    - c. PERIOD digit: 10" (254 mm) high.
    - d. Bonus indicators: 4" (102 mm) high.
    - e. Possession arrows: 3" (76 mm) high.
    - f. Clock/colon and PERIOD digits and bonus indicators: amber LEDs.
    - g. Score digits and possession indicators: red LEDs.
    - h. Seven bar segments per digit.

4. Captions
    - a. Vinyl applied directly to scoreboard face.
    - b. HOME and GUEST captions: 6" (152 mm) high.
    - c. PERIOD caption: 4" (102 mm) high.
    - d. Color: standard white or others available upon request.
  5. Horn
    - a. Vibrating horn mounted inside the scoreboard cabinet behind the face.
    - b. Sounds automatically when period clock counts down to zero.
    - c. Sounds manually as directed by operator.
  6. Power Cord
    - a. Cord is 11' (3.35 m) long.
    - b. Cord plugs into a standard grounded outlet.
  7. Accessory Equipment
    - a. Vinyl striping applied around the clock and scoreboard face.
      - 1) Two 6" (152 mm) high Programmable Team Name Message Centers (TNMCs) in place of vinyl HOME and GUEST captions - add 60 lb (27 kg) and 400 W.
      - 2) Double bonus indicators in place of single bonus indicators.
      - 3) Two 17" (432 mm) high, 33" (838 mm) wide aluminum panels in upper corners with vinyl logo/sponsor decoration.
      - 4) Hinged metal mesh protective screen - painted to match scoreboard.
      - 5) Hardware for suspension installation.
- C. Scoring Console
1. Console is an All Sport® 5000 controller.
  2. Scores multiple sports using changeable keyboard inserts.
  3. Controls multiple scoreboards, stats displays and shot clocks, including other All Sport 5000 controlled displays currently owned by customer.
  4. Recalls clock, score, and period information if power is lost.
  5. Runs Time of Day and Segment Timer modes.
  6. Console includes:
    - a. Rugged aluminum enclosure to house electronics.
    - b. Sealed membrane water-resistant keyboard.
    - c. 32-character backlit LCD to verify entries and recall information currently displayed.
    - d. Power cord that plugs into a standard grounded outlet; 6 watts max.
    - e. Control cable to connect to the control receptacle junction box (wired system only).
    - f. Hand-held switch for main clock start/stop and horn.
    - g. Soft-sided carrying case.
  7. Accessory Equipment
    - a. Hard carrying case.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that mounting structure is ready to receive scoreboard. Verify that placement of conduit and junction boxes are as specified and indicated in plans and shop drawings. Verify concrete has cured adequately according to specifications.

### **3.02 INSTALLATION**

- A. All power and control cables to scoreboards and displays will be routed in conduit. Power to the scoreboards/displays as well as raceways shown on electrical plans by the Electrical Contractor. Scoreboard control wiring including conduit will be the responsibility of the contractor assigned the scoreboard equipment.
- B. Install scoreboards and exterior displays to beams in location detailed and in accordance with manufacturer's instructions. Verify unit is plumb and level.
- C. Provide scoreboard and required structure in its entirety

### **3.03 INSTALLATION-CONTROL CENTER**

- A. Provide boxes, cover plates and jacks in locations per plans.
- B. Test connect control unit to all jacks and check for proper operation of control unit, scoreboard and all features. Leave control unit in carrying case and other loose accessories with Owner's designated representative.
- C. Verify earth ground does not exceed 15 ohms.

**END OF SECTION**

**SECTION 12 2100  
WINDOW BLINDS**

**PART 1 – GENERAL**

**1.01 SECTION INCLUDES**

- A. Horizontal Blinds

**1.02 RELATED WORK**

- A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 01 of these specifications.

**1.03 SCOPE**

- A. Furnish and install window blinds in accordance with specifications, drawings, and contract documents.
- B. All workmanship, details and procedures shall comply with current manufacturer's recommendations.
- C. General locations and detail of system are shown on the drawings and/or window schedule.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide product literature and installation instructions.
- C. Shop Drawings: Indicate field-measured dimensions of opening which are to receive blinds, details on mounting surface and sill conditions, and details of corners and conditions between adjacent blinds.
- D. Samples for selection of Colors: Submit manufacturers full range of colors.

**1.05 WARRANTY**

- A. Limited Lifetime Warranty: Manufacturer shall repair or replace for the life of the blind, at its option, without charge to the Owner, any part found defective in workmanship or material as long as the blind remains in the same window for which it was purchased.

**PART 2 – PRODUCTS**

**2.01 ACCEPTABLE MANUFACTURER**

- A. Levolor Contract: [www.levolor.com](http://www.levolor.com).
- B. Hunter Douglas: [www.hunterdouglascontract.com](http://www.hunterdouglascontract.com).
- C. Spring Window Fashions, LLC: [www.springwindowfashions.com](http://www.springwindowfashions.com)
- D. Substitutions: See Section 01 6000 - Product Requirements.

**2.02 HORIZONTAL BLINDS – TYPICAL ALL WINDOWS, U.N.O.**

- A. Basis of Design: Levolor Contract; Riviera Contract 1" Blind, model #RIV1C.
- B. Materials:
  - 1. Head Channel shall be of .025" thick Tomized steel, U-shaped 1" high x 1-9/16" wide with flanged edges at top, and coated with a baked-on finish. All hardware shall be enclosed in the metal head.
  - 2. Guardian Tilter TM shall be of .042" Tomized steel or of .040" nylon with automatically disengaging worm and gear mechanism to eliminate overdrive and prevent strain or damage to blind.
  - 3. Tilt Wand shall be transparent with a hexagonal cross section 5/16" across flats.
  - 4. Drum and Cradle shall be provided for each blind ladder.
    - a. Drum shall be of .031" Tomized steel having two holes with rolled edges to anchor barbs of both ladder ends.

- b. Cradles shall be of .042" thick Tomized steel, having two holes with rolled edges to guide cords through bottom of head channel without abrasion.
- 5. Tilt Rod shall be U-shaped with a circular radius of approximately 1/8" designed to achieve minimum torsional deflection. For blinds over 60" wide and under 80" long or over 55" wide and over 80" long, tilt rod shall be a solid D-shaped rod with an average cross section of 1/4" designed to achieve minimum torsional deflection.
- 6. End Braces shall be of .037" thick Tomized steel with reinforcing ribs and field adjustable tabs.
- 7. Installation Brackets shall incorporate a rivet-hinged safety locking front cover and shall be at least .048" thick Tomized steel with baked-on finish to match head channel.
- 8. Intermediate Brackets shall be .050" Tomized steel and shall be installed with blinds over 60" wide and under 80" long or over 55" wide and over 80" long.
- 9. Ladders (slat supports) shall be of braided polyester yarn designed for maximum strength and flexibility combined with minimum stretch. Rungs shall consist of not less than two crossed cables inter-braided with the vertical components. Ladders shall support the slats without visible distortion. Distance between ladders are not to exceed 23" for blinds over 80" long. For blinds up to 80" long, distance between ladders shall not be greater than 22".
- 10. Slats shall be of virgin aluminum alloyed for maximum strength and corrosion resistance. Slats shall be nominally 1" wide with an elliptical crown formed after coating and curing. Slat thickness and ladder support distances shall prevent visible sag or bow after continued use indoors. Slats shall be un-perforated.
- 11. Bottom Rail shall be of .031" Tomized steel formed after coating and shall be provided with color-compatible molded plastic ladder and end caps.
- 12. Lift Cord shall be braided of high-strength polyester fiber cord, shall be flexible, have minimum stretch, maximum abrasion resistance characteristics. Cord shall be of sufficient length, equalized to properly control raising and lowering of blind and spaced not over 46" between cords.
- 13. Color of blind shall be as selected by Architect.
- 14. Blinds shall be continuous between jambs unless otherwise noted.

### **PART 3 – EXECUTION**

#### **3.01 INSPECTION AND PREPARATION**

- A. Blind subcontractor shall be responsible for inspection of site, approval of mounting surfaces, installation conditions and field measurements for this work.

#### **3.02 INSTALLATION**

- A. Installation shall comply with manufacturer's recommendations.

#### **3.03 CLEANING**

- A. Clean finished installation of dirt and marks as recommended and approved by the manufacturer.
- B. Leave work area clean and free of debris.

**END OF SECTION**



**SECTION 12 2400  
WINDOW SHADES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Window shades and accessories.
- B. Electric motor operators.
- C. Motor controls.

**1.02 REFERENCE STANDARDS**

- A. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films 2023, with Errata.
- B. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems Current Edition, Including All Revisions.

**1.03 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene one week prior to commencing work related to products of this section; require attendance of all affected installers.
- B. Sequencing:
  - 1. Do not fabricate shades until field dimensions for each opening have been taken.
  - 2. Do not install shades until final surface finishes and painting are complete.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.
  - 1. Motorized Shades: Include power requirements and standard wiring diagrams.
- C. Shop Drawings: Include shade schedule indicating size, location and keys to details, head, jamb and sill details, mounting dimension requirements for each product and condition, and operation direction.
- D. Certificates: Manufacturer's documentation that line voltage components are UL listed or UL recognized.
- E. Source Quality Control Submittals: Provide test reports indicating compliance with specified fabric properties.
- F. Selection Samples: Include fabric samples in full range of available colors and patterns.
- G. Verification Samples: Minimum size 6 inches square, representing actual materials, color and pattern.
- H. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- I. Project Record Documents: Record actual locations of control systems and show interconnecting wiring.
- J. Operation and Maintenance Data: List of all components with part numbers, sources of supply, and operation and maintenance instructions; include copy of shop drawings.
- K. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.

- B. Installer Qualifications: Company specializing in performing work of this type with minimum five years of documented experience.
  - 1. Factory training and demonstrated experience.

#### **1.06 MOCK-UP**

- A. Mock-Up: Provide full size mock-up of window shade complete with selected shade fabric including sample of seam when applicable.
  - 1. Obtain Architect's approval of light and privacy characteristics of fabric prior to fabrication.
  - 2. Full-sized mock-up may become part of the final installation.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver shades in manufacturer's unopened packaging, labeled to identify each shade for each opening.
- B. Handle and store shades in accordance with manufacturer's recommendations.

#### **1.08 FIELD CONDITIONS**

- A. Do not install products under environmental conditions outside manufacturer's absolute limits.

#### **1.09 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide manufacturer's warranty from Date of Substantial Completion, covering the following:
  - 1. Roller Shade Hardware, Chain and Shadecloth: Manufacturer's standard non-depreciating twenty-five year limited warranty.
  - 2. Roller Shade Motors and Motor Control Systems: Manufacturer's standard non-depreciating five-year warranty.
  - 3. Roller Shade Installation: One year from date of Substantial Completion, not including scaffolding, lifts or other means to reach inaccessible areas.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Manually Operated Roller Shades:
  - 1. MechoShade System, Inc.: [www.mechoshade.com](http://www.mechoshade.com)
  - 2. Draper, Inc: [www.draperinc.com/sle](http://www.draperinc.com/sle).
  - 3. Lutron Electronics Co., Inc: [www.lutron.com/sle](http://www.lutron.com/sle).
  - 4. Hunter Douglas Architectural: [www.hunterdouglasarchitectural.com/#sle](http://www.hunterdouglasarchitectural.com/#sle).
  - 5. Levolor: [www.levolor.com/commercial/#sle](http://www.levolor.com/commercial/#sle).
  - 6. Hunter Douglas: [www.hunterdouglas.com](http://www.hunterdouglas.com).
  - 7. SWFcontract, a division of Springs Window Fashions, LLC.: [www.swfcontract.com](http://www.swfcontract.com).
  - 8. Substitutions: See Section 01 6000 - Product Requirements.
- B. Motorized Roller Shades, Motors and Motor Controls:
  - 1. MechoShade System, Inc.: [www.mechoshade.com](http://www.mechoshade.com)
  - 2. Draper, Inc: [www.draperinc.com/sle](http://www.draperinc.com/sle).
  - 3. Hunter Douglas: [www.hunterdouglas.com](http://www.hunterdouglas.com).
  - 4. Lutron Electronics Co., Inc: [www.lutron.com](http://www.lutron.com).
  - 5. Hunter Douglas Architectural: [www.hunterdouglasarchitectural.com/#sle](http://www.hunterdouglasarchitectural.com/#sle).
  - 6. Levolor: [www.levolor.com/commercial/#sle](http://www.levolor.com/commercial/#sle).
  - 7. SWFcontract, a division of Springs Window Fashions, LLC.: [www.swfcontract.com](http://www.swfcontract.com).
  - 8. Substitutions: See Section 01 6000 - Product Requirements.
- C. Basis of Design: Motorized Shade System
  - 1. MechoShade System, Inc.: Electro Shade System, Electro/2
- D. Basis of Design: Manual Shade System
  - 1. MechoShade System, Inc.: Mecho SlimLine

- E. Source Limitations: Furnish products produced by a single manufacturer and obtained from a single supplier.

## **2.02 WINDOW SHADE APPLICATIONS**

- A. Shades: Translucent or blackout as scheduled.
  - 1. Type: Roller shades.
    - a. Fabric: Translucent or blackout as scheduled.
  - 2. Color: Refer to Schedule of Materials and Colors.
  - 3. Mounting: Inside (between jambs).
  - 4. Operation: Manual and motorized, in locations indicated.

## **2.03 ROLLER SHADES**

- A. Roller Shades: Fabric roller shades complete with mounting brackets, roller tubes, hembars, hardware and accessories.
  - 1. Size: As indicated on drawings.
- B. Fabric: Non-flammable, color-fast, impervious to heat and moisture, and able to retain its shape under normal operation.
  - 1. Flammability: Pass NFPA 701 large and small tests.
- C. Roller Tubes: As required for type of operation.
  - 1. Size: Manufacturer's standard, selected for suitability for installation conditions, span, and weight of shades.
- D. Hembars: Designed for weight requirements and adaptation to uneven surfaces, to maintain bottom of shade straight and flat.
  - 1. Style: Full wrap fabric covered bottom bar, flat profile with closed ends.
- E. Manual Operation: Clutch operated continuous loop; beaded ball chain.
- F. Motor Operation: Motor system housed inside roller tube, controlling shade movement via motor controls indicated; listed to UL 325.
  - 1. Audible Noise: Maximum 39 dBA measured 3 feet from the motor unit; no audible clicks when motor starts and stops.
  - 2. Motors: Size and configuration as recommended by manufacturer for the type, size, and arrangement of shades to be operated; integrated into shade operating components and concealed from view.
  - 3. Motor Type: AC, for direct hardwired connection to AC power source.
  - 4. Coupling of Multiple Shades: Where possible, minimize number of motors by coupling adjacent shades.
  - 5. Control Compatibility: Fully compatible with the controls to be installed.

## **2.04 MOTOR CONTROLS**

- A. Motorized shades to be controlled by wall-mounted controls as specified below.
- B. Control Requirements:
  - 1. Unless specifically indicated to be excluded, provide all required equipment, conduit, boxes, wiring, connectors, hardware, supports, accessories, software, system programming, etc. as necessary for a complete operating system that provides the control intent indicated.
  - 2. Capable of controlling shade speed for tracking within plus or minus 0.125 inch throughout entire travel.
  - 3. Capable of stopping within accuracy of 0.125 inch at any point between open and close limits.
  - 4. Capable of assigning shades to groups and subgroups without rewiring.
  - 5. Capable of storing programmable stop points, including open, close, and any other position.
  - 6. Provide power failure memory for preset stops, open and close limits, shade grouping and subgrouping and system configuration.

- 7. Capable of synchronizing multiple units of the same size to start, stop and move in unison.
- 8. Provide all components and connections necessary to interface with other systems as indicated.
- C. Wall-Mounted Controls: UV stabilized visible parts meeting {rs\#1}; provided by shade manufacturer.

## **2.05 ACCESSORIES**

- A. Fascias: Size as required to conceal shade mounting.
  - 1. Style: As selected by Architect from shade manufacturer's full selection.
  - 2. Material and Color: To match shade.
- B. Brackets and Mounting Hardware: As recommended by manufacturer for mounting configuration and span indicated.
- C. Fasteners: Non-corrosive, and as recommended by shade manufacturer.

## **2.06 FABRICATION**

- A. Field measure finished openings prior to ordering or fabrication.
- B. Fabricate shades to fit openings within specified tolerances.
  - 1. Vertical Dimensions: Fill openings from head to sill with 1/2 inch space between bottom bar and window sill.
  - 2. Horizontal Dimensions - Inside Mounting: Fill openings from jamb to jamb.
- C. Dimensional Tolerances: As recommended in writing by manufacturer.
- D. At openings requiring continuous multiple shade units with separate rollers, locate roller joints at window mullion centers; butt rollers end-to-end.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Examine finished openings for deficiencies that may preclude satisfactory installation.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Start of installation shall be considered acceptance of substrates.

### **3.02 PREPARATION**

- A. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under the project conditions.
- B. Coordinate with window installation and placement of concealed blocking to support shades.

### **3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.
- B. Installation Tolerances:
  - 1. Inside Mounting: Maximum space between shade and jamb when closed of 1/16 inch.
  - 2. Maximum Offset From Level: 1/16 inch.
- C. Replace shades that exceed specified dimensional tolerances at no extra cost to Owner.
- D. Adjust level, projection and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure smooth shade operation.

### **3.04 CLEANING**

- A. Clean soiled shades and exposed components as recommended by manufacturer.
- B. Replace shades that cannot be cleaned to "like new" condition.

### **3.05 CLOSEOUT ACTIVITIES**

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

- B. See Section 01 7900 - Demonstration and Training, for additional requirements.
- C. Demonstration: Demonstrate operation and maintenance of window shade system to Owner's personnel.

**3.06 PROTECTION**

- A. Protect installed products from subsequent construction operations.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

**3.07 MAINTENANCE**

- A. See Section 01 7000 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.

**END OF SECTION**



**SECTION 12 3200  
MANUFACTURED WOOD CASEWORK**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Manufactured custom plastic-laminate-faced casework, with cabinet hardware.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 1000 - Rough Carpentry: Blocking and nailers for anchoring casework.
- B. Section 07 9200 - Joint Sealants: Sealing joints between casework and countertops and adjacent walls, floors, and ceilings.
- C. Section 08 8000 - Glazing: Methods for shop-glazing of casework.
- D. Section 12 3600 - Countertops: Additional requirements for countertops.

**1.03 DEFINITIONS**

- A. Exposed: Portions of casework visible when drawers and cabinet doors are closed, including end panels, bottoms of cases more than 42 inches above finished floor, tops of cases less than 72 inches above finished floor and all members visible in open cases or behind glass doors.
- B. Semi-Exposed: Portions of casework and surfaces behind solid doors, tops of cases more than 72 inches above finished floor and bottoms of cabinets more than 30 inches but less than 42 inches above finished floor.
- C. Concealed: Sleepers, web frames, dust panels and other surfaces not generally visible after installation and cabinets less than 30 inches above finished floor.

**1.04 REFERENCE STANDARDS**

- A. ANSI A135.4 - Basic Hardboard 2012 (Reaffirmed 2020).
- B. ANSI/AWI 0641 - Architectural Wood Casework Standard 2019.
- C. ASTM C1036 - Standard Specification for Flat Glass 2021.
- D. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass 2018.
- E. BHMA A156.9 - Cabinet Hardware 2020.
- F. NEMA LD 3 - High-Pressure Decorative Laminates 2005.

**1.05 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Conduct a preinstallation meeting at least one week prior to the start of the work of this section; require attendance by all affected installers.
- B. Keying Conference: Conduct conference prior to ordering keys. Incorporate conference decisions into keying submittal.

**1.06 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Component dimensions, configurations, construction details, joint details, attachments and hardware.
- C. Shop Drawings: Indicate casework types, sizes, and locations, using large scale plans, elevations, and cross sections. Include rough-in and anchors, reinforcements, and blocking, placement dimensions and tolerances, clearances required, and keying information.
- D. Samples for Finish Selection: Fully finished, for color selection. Minimum sample size: 6 inches by 6 inches or as indicated.
  - 1. Plastic laminate samples, for color, texture, and finish selection, size 6 inches by 6 inches.
- E. Samples for Hardware Selection: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.

- F. Manufacturer's Qualification Statement.
- G. Installer's Qualification Statement.
- H. Maintenance Data: Manufacturer's recommendations for care and cleaning.
- I. Finish touch-up kit for each type and color of materials provided.

#### **1.07 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience and one project within the last five years with a value of woodwork within 20 percent of cost of woodwork for this project.
- B. Perform cabinet construction in accordance with ANSI/AWI 0641 - Architectural Woodwork Standards.
- C. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than five years of documented experience and approved by manufacturer.

#### **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Protect items provided by this section, including finished surfaces and hardware items during handling and installation. For metal surfaces, use polyethylene film or other protective material standard with the manufacturer.
- B. Acceptance at Site:
  - 1. Do not deliver or install casework until the conditions specified under Part 3, Examination Article of this section have been met. Products delivered to sites that are not enclosed and/or improperly conditioned will not be accepted if warping or damage due to unsatisfactory conditions occurs.
- C. Storage:
  - 1. Store casework in the area of installation. If necessary, prior to installation, temporarily store in another area, meeting the environmental requirements specified under Part 3, "Site Verification of Conditions" Article of this section.

#### **1.09 MOCK-UPS**

- A. Provide full size base cabinet, upper cabinet, and tall cabinet complete with drawers, door, adjustable shelf and countertop of every finish type.
- B. See Section 01 4000 - Quality Requirements for additional requirements.
- C. Locate where directed by the Architect.
- D. Mock-up may remain as part of the work.

#### **1.10 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Correct defective Work within a two year period after Date of Substantial Completion, at no additional cost to Owner. Defects include, but are not limited to:
  - 1. Ruptured, cracked, or stained finish coating.
  - 2. Discoloration or lack of finish integrity.
  - 3. Cracking or peeling of finish.
  - 4. Delamination of components.
  - 5. Failure of adhesives.
  - 6. Failure of hardware.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Manufacturer shall be members in good standing of the Architectural Woodwork Institute (AWI).
- B. Obtain casework from single source and manufacturer, unless otherwise indicated.



## **2.02 CASEWORK, GENERAL**

- A. Quality Standard: ANSI/AWI 0641 - Architectural Woodwork Standards; 2019.
- B. Types: When more than one type is required, see drawings for location of each type of casework.
- C. Plastic Laminate Faced Cabinets: Custom Grade.
- D. Desks and Display Cases - Premium Grade
- E. Refer to Schedule of Materials and Colors and Drawings for additional casework details.

## **2.03 LUMBER MATERIALS**

- A. Hardwood Lumber: NHLA; Graded in accordance with ANSI/AWI 0641, Grade II/Custom; average moisture content of 6-8 percent; species as scheduled.
- B. Solid Lumber: Any Species, with no defects affecting strength or utility.

## **2.04 PANEL MATERIALS**

- A. Plastic-laminate-faced Plywood for Non-Decorative Purposes: NIST PS 1, Interior rated adhesives, core of wood plies from any species suitable for intended use unless otherwise indicated, thickness as indicated or as required by application.
  - 1. Provide 1" thick shelves at storage/book rooms.
  - 2. Provide 1" thick shelves when length is 36" or longer.
- B. Hardboard: AHA A135.4; Pressed wood fiber with resin binder, Class 1 - Tempered, 1/4 inch thick, smooth one side for horizontal applications, smooth two sides (S2S) for vertical applications; use for drawer bottoms, dust panels, vertical slot dividers, and other components indicated on drawings.

## **2.05 FABRICATION**

- A. Assembly: Shop assemble casework items for delivery to site in units easily handled and to permit passage through building openings.
- B. Construction: As required for selected grade.
- C. Cabinet support bases shall be fabricated from solid pressure-treated 2x4 lumber.
- D. Fabricate all drawers boxes using 1/2" inch, 9-ply laminated hardwood plywood. The top edges of the drawer box sides and back are radiused. Drawer bottom is let in on four sides, and securely glued underneath with a continuous bead of glue around the perimeter of the drawer bottom. Additional bottom braces are used on drawers over 24" wide. All components have one coat of clear waterproof sealer. Drawer boxes are screw-attached to separate drawer fronts.
- E. Glazing for Doors: 1/4 inch Clear tempered glass.
- F. Fittings and Fixture Locations: Cut and drill components for fittings and fixtures.
- G. Hardware Application: Factory-machine casework members for hardware that is not surface applied.
- H. Access Panels: Where indicated, for maintenance of utility service and mechanical and electrical components.
- I. Removable back panels on indicated base cabinets. Provide partial height back panels at sink cabinets.
- J. Fixed panels at backs of open spaces between base cabinets.
  - 1. Provide cutouts for power and data receptacles where indicated on drawings.
- K. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.
- L. Scribes and Fillers: Panels of matching construction and finish, for locations where cabinets do not fit tight to adjacent construction.
- M. Apron Frames: Construction similar to other cabinets, with modifications.

1. Frames fabricated from panels standard with the manufacturer. Include front and back panels, with drawer suspension framing mechanically fastened to support channels spanning between them.
2. Apron Drawers: Manufacturer's standard drawer construction and size for apron installation. Single drawer for aprons up to 36 inches wide maximum, two drawers for wider aprons.
- N. Countertop Panel-Type Supports: Materials similar to adjacent casework, 1-1/2 inch in width, with front-to-back and toe space dimensions matching base cabinet. Designed to be secured in a concealed fashion to countertop material. Include two leveling devices per support panel.
- O. Countertop Metal Supports: Hidden metal support brackets of size and configuration as required for support of countertops depth as detailed in the drawings.
  1. Manufactures:
    - a. Centerline Brackets: [www.countertopbracket.com](http://www.countertopbracket.com)
    - b. Substitutions: See Section 01 6000 - Product Requirements.

## **2.06 PLASTIC-LAMINATE-CLAD CASEWORK**

- A. Plastic-Laminate-Clad Casework: Solid wood and wood panel construction; each unit self-contained and not dependent on adjacent units or building structure for rigidity; in sizes necessary to avoid field cutting except for scribes and filler panels. Include adjustable levelers for base and tall cabinets.
  1. Style: Flush overlay. Ease doors and drawer fronts slightly at edges.
  2. Cabinet Nominal Dimensions: Unless otherwise indicated, provide cabinets of widths and heights indicated on drawings, and with following front-to-back dimensions:
    - a. Base Cabinets: 24 inches.
    - b. Tall Cabinets: 24 inches.
    - c. Wall Cabinets: 14 inches.
  3. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline.
    - a. See Schedule of Materials and Colors for products Basis of Design and additional information.
    - b. Finish: Matte or suede, gloss rating of 5 to 20.
    - c. Surface Color and Pattern: As scheduled.
    - d. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
    - e. Cap exposed plastic laminate finish edges with plastic trim.
      - 1) 3mm PVC, flat shaped; smooth finish; of width to match component thickness
        - (a) Door and drawer fronts (Color match to face laminate).
        - (b) Counter top exposed edges (Color match to face laminate).
      - 2) 1mm PVC, flat shaped; smooth finish; of width to match component thickness.
        - (a) Exposed component edges (Color match to face laminate).
        - (b) Backsplash and return exposed edges (Color match to face laminate).

## **2.07 COUNTERTOPS**

- A. Countertops: See Section 12 3600.

## **2.08 CABINET HARDWARE**

- A. Manufacturer's standard types, styles and finishes, and as indicated below.
- B. Comply with BHMA A156.9 requirements.
- C. Locks: Provide locks on casework drawers and doors where indicated. Provide C415 locks.
  1. Keying: Key locks alike within a space; key each room separately.
  2. Master Key System: All locks operable by master key.
  3. All keys to be delivered to the Director of Facilities.
- D. Shelves in Cabinets:
  1. Shelf Standards and Rests: 4 Standards (K & V)#255, 4 Brackets/Shelf(K & V)#256.

- E. Swinging Doors: Hinges, pulls, and catches.
  - 1. Hinges: Concealed, number as required by referenced standards for width, height, and weight of door.
    - a. Concealed Hinges: Installed in cabinet edge, and on door back, satin chromium plated over nickel on base material.
      - 1) European-Style Hinges, soft close, for Overlay Doors: 120 degree opening angle.
  - 2. Pulls: Satin Chrome wire pulls, 4 inches wide.
    - a. Pull design to comply with project's referenced accessibility requirements.
  - 3. Catches: Magnetic.
- F. Drawers: Pulls and slides.
  - 1. Pulls: Satin Chrome wire pulls, 4 inches wide (typical).
    - a. Pull design to comply with project's referenced accessibility requirements.
  - 2. Slides: Steel, full extension arms, ball bearings; soft close, capacity as recommended by manufacturer for drawer height and width.
- G. Pull-Out Keyboard Tray
  - 1. Each to have: (K & V)#5710
- H. Clothes Rod each to have:
  - 1. Rod (K & V)#770 5
  - 2. Flange (K & V)#764 CHR
- I. Adjustable Shelves at Display Cases, each to have:
  - 1. Standards (K & V)#87
  - 2. Brackets/Shelf (K & V)#186
- J. Casters:
  - 1. Swivel-type: 4-inch diameter wheels of soft or hard rubber and self-lube wheel bearing. Swivel is double-level, hardened ball bearing. All metal surfaces are zinc-plated.
  - 2. Rigid-type: 4-inch wheels of soft or hard rubber, held in horns of formed steel, zinc plated. Wheel spanner bushings. Load capacity is 225 pounds per caster. Brake available on both swivel and rigid.

## 2.09 MATERIALS

- A. Wood-Based Materials:
  - 1. Solid Wood: Air-dried to 4.5 percent moisture content, then tempered to 6 percent moisture content before use.
  - 2. Composite Wood Panels: Containing no urea-formaldehyde resin binders.
- B. Concealed Solid Wood or Plywood: Any species and without defects affecting strength or utility.
- C. Hardboard: ANSI A135.4, Class 1, tempered.
- D. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications, complying with Grade requirements, and standard with the manufacturer.
  - 1. Provide specific types as follows:
    - a. Horizontal Surfaces: HGS, 0.048 inch nominal thickness, colors as scheduled, .
    - b. Vertical Surfaces: VGS, 0.028 inch nominal thickness, colors as scheduled, .
    - c. Post-Formed Horizontal Surfaces: HGP, 0.039 inch nominal thickness, colors as scheduled, .
    - d. Post-Formed Vertical Surfaces: VGP, 0.028 inch nominal thickness, colors as scheduled, .
    - e. Flame Retardant Surfaces: HGF, 0.048 inch nominal thickness, colors as scheduled, .
    - f. Cabinet Liner: CLS, 0.020 inch nominal thickness, colors as scheduled, .

- g. Laminate Backer: BKL, 0.020 inch nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.
- E. Glass: Fully tempered float; ASTM C1036, Type 1, Quality Q3; ASTM C1048, tempered using horizontal tempering; 1/4 inch thick minimum; clear.

## **2.10 ACCESSORIES**

- A. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.
- B. Concealed Joint Fasteners: Corrosion-resistant, standard with manufacturer.
- C. Grommets: Standard plastic or rubber grommets for cut-outs, in color to match adjacent surface.
- D. Sealant for Use in Casework Installation:
  - 1. Manufacturer's recommended type.
- E. Concealed Fastening Clips: Provide for accessible panels and other areas indicated on the drawings.
- F. Cable Management Tray: Size and configuration required for application.
- G. Door/Drawer Silencers: 2 per door/drawer minimum, 3 for door/drawers over 48 inches.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Large Components: Ensure that large components can be moved into final position without damage to other construction.

### **3.02 EXAMINATION**

- A. Site Verification of Environmental Conditions:
  - 1. Do not deliver casework until the following conditions have been met:
    - a. Building has been enclosed (windows and doors sealed and weather-tight).
    - b. An operational HVAC system that maintains temperature and humidity at occupancy levels has been put in place.
    - c. Ceiling, overhead ductwork, piping, and lighting have been installed.
    - d. Installation areas do not require further "wet work" construction.
- B. For Base Cabinets Installation: Examine floor levelness and flatness of installation space. Do not proceed with installation if encountered floor conditions required more than 1/2 inch leveling adjustment. When installation conditions are acceptable, for each space, establish the high point of the floor. Set and make level and plumb first cabinet in relation to this high point.
- C. For Wall Cabinets Installation: Examine wall surfaces in installation space. Do not proceed with installation if the following conditions are encountered:
  - 1. Maximum variation from plane of masonry wall exceeds 1/4 inch in 10 ft and 1/2 inch in 20 ft or more, and/or maximum variation from plumb exceeds 1/4 inch per story.
  - 2. Maximum Variation of finished gypsum board surface from true flatness: 1/8 inch in 10 feet in any direction.
- D. Verify adequacy of support framing and anchors.
- E. Verify that service connections are correctly located and of proper characteristics.

### **3.03 INSTALLATION**

- A. Perform installation in accordance with manufacturer's instructions.
- B. Use anchoring devices to suit conditions and substrate materials encountered. Use concealed fasteners to the greatest degree possible. Use exposed fasteners only where allowed by approved shop drawings, or where concealed fasteners are impracticable.
- C. Set casework items plumb and square, securely anchored to building structure.

- D. Align cabinets to adjoining components, install filler and/or scribe panels where necessary to close gaps.
- E. Fasten together cabinets in continuous runs, with joints flush, uniform and tight. Misalignment of adjacent units not to exceed 1/16 inch. In addition, do not exceed the following tolerances:
  - 1. Variation of Tops of Base Cabinets from Level: 1/16 inch in 10 feet.
  - 2. Variation of Bottoms of Wall Cabinets from Level: 1/8 inch in 10 feet.
  - 3. Variation of Faces of Cabinets from a True Plane: 1/8 inch in 10 feet.
  - 4. Variation of Adjacent Surfaces from a True Plane (Lippage): 1/32 inch.
  - 5. Variation in Alignment of Adjacent Door and Drawer Edges: 1/16 inch.
- F. Secure wall and floor cabinets to concealed reinforcement and blocking at gypsum board assemblies.
- G. Base Cabinets: Fasten cabinets to service space framing and/or wall substrates, with fasteners spaced not more than 16 inches on center. Bolt adjacent cabinets together with joints flush, tight, and uniform.
  - 1. Where base cabinets are installed away from walls or service space framing, anchor to floor at toe space at not more than 24 inches on center, and at sides of cabinets with not less than two fasteners per side.
- H. Wall Cabinets: Fasten to hanging strips, and/or wall substrates. Fasten each cabinet through back, near top, at not less than 16 inches on center.
- I. Install hardware uniformly and precisely.
- J. Countertops: Install countertops intended and furnished for field installation in one true plane, with ends abutting at hairline joints, and no raised edges.
- K. Replace units that are damaged, including those that have damaged finishes.

#### **3.04 ADJUSTING**

- A. Adjust operating parts, including doors, drawers, hardware, and fixtures to function smoothly.

#### **3.05 CLEANING**

- A. Clean casework and other installed surfaces thoroughly.

#### **3.06 PROTECTION**

- A. Do not permit finished casework to be exposed to continued construction activity.
- B. Protect casework and countertops from ongoing construction activities. Prevent workmen from standing on, or storing tools and materials on casework or countertops.
- C. Repair damage, including to finishes, that occurs prior to Date of Substantial Completion, using methods prescribed by manufacturer; replace units that cannot be repaired to like-new condition.

**END OF SECTION**



**SECTION 12 3551**  
**MUSIC INSTRUMENT STORAGE CASEWORK**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Music Instrument Storage Casework
- B. Acoustically Enhanced Music Instrument Storage Casework

**1.02 RELATED REQUIREMENTS**

- A. General and Supplementary Conditions of the Contract, Division 1 General Requirements, and Drawings are applicable to this Section.
- B. Division 06 Section "Rough Carpentry" for blocking in frame walls required to anchor casework.

**1.03 REFERENCES**

- A. American National Standards Institute (ANSI):
  - 1. ANSI A208.1 – Particleboard.
- B. American Society of Civil Engineers (ASCE):
  - 1. ASCE 7 – Minimum Design Loads for Buildings and Other Structures.
- C. ASTM International (ASTM):
  - 1. ASTM C 423 – Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
  - 2. ASTM E 488 – Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements.
  - 3. ASTM E 795 – Standard Practices for Mounting Test Specimens During Sound Absorption Tests.
- D. GREENGUARD Environmental Institute (GEI):
  - 1. GREENGUARD certified low emitting products.
- E. Audio Engineering Society (AES):
  - 1. AES-4id – AES information document for room acoustics and sound reinforcement systems -- Characterization and measurement of surface scattering uniformity.
- F. Builders Hardware Manufacturers Association (BHMA):
  - 1. ANSI/BHMA A156.9 – Cabinet Hardware.
- G. National Electrical Manufacturers Association (NEMA):
  - 1. NEMA LD 3 – High Pressure Decorative Laminates.
- H. U.S. Department of Commerce, National Institute of Standards and Technology (NIST):
  - 1. DOC PS 1 – U.S. Product Standard for Construction and Industrial Plywood.
- I. California Air Resources Board (CARB).
- J. California 93120 – Formaldehyde Emissions Phase I.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets, installation instructions, and maintenance recommendations.
- C. Shop Drawings: Prepared by manufacturer. Include elevations showing casework components, details of each condition of installation, and types and locations of hardware and fasteners. Show fabrication and installation details. Include plans, elevations, sections, details, and attachments to other Work.
- D. Samples: For each color and finish for each exposed casework component.
- E. Operation and Maintenance Data.

F. Warranty: Submit sample meeting warranty requirements of this Section.

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Approved manufacturer listed in this section, with minimum 5 years experience in manufacture of similar products in use in similar environments. Obtain music education storage casework through one source from a single approved manufacturer.
  - 1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time period allowed for substitution review:
    - a. Product data, including certified independent test data indicating compliance with requirements for acoustical performance.
    - b. Samples of each type of product specified, including but not limited to the following:
      - 1) Schedule 1 Door and casework panels.
      - 2) Schedule 2 Grille doors.
      - 3) Schedule 3 Hinges with through-bolting hardware.
      - 4) Schedule 4 Latches with through-bolting hardware.
    - c. Project references: minimum of 5 installations not less than 5 years old, with owner contact information.
    - d. List of successful installations of similar products available for evaluation by Architect.
    - e. Sample warranty.
  - 2. Submit substitution request not less than 15 days prior to bid date. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements.
  - 3. Approved manufacturers must meet separate requirements of Submittals Article.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, store, and handle music education storage casework in accordance with manufacturer's recommendations. Ship to jobsite only after roughing-in, painting work, and other related finish work has been completed and installation areas are ready to accept casework and recommended temperature and humidity levels will be maintained during the remainder of construction.

#### **1.07 COORDINATION**

- A. Coordinate installation of blocking and supports in frame wall assemblies under work of other sections where required for anchoring of music education storage casework.
- B. Project Environmental Requirements
  - 1. Comply with requirements of referenced standards and recommendations of material manufacturers for environmental conditions before, during, and after installation.
  - 2. Do not begin installation until building is completely enclosed and HVAC system is operating and maintaining temperature and humidity conditions consistent with "after occupancy" conditions for a minimum of 2 weeks.
  - 3. Maintain continuous and uniform building temperatures of not less than 50 degrees F during installation nor more than 85 degrees F.
  - 4. Environmental Requirements: Do not install cabinets until all mortar, wet and dust producing work is completed.
  - 5. Field Measurements: Obtain required field measurements from the Contractor and indicate on Shop Drawings.

#### **1.08 WARRANTY**

- A. Special Warranty: Manufacturer's written warranty indicating manufacturer's intent to repair or replace components of music education storage casework that fail in materials or workmanship within 10 years from date of Substantial Completion. Failures are defined to include, but are not limited to, the following:
  - 1. Fracturing or breaking of casework components including doors, panels, shelves, or hardware resulting from normal wear and tear and normal use other than vandalism.
  - 2. Delamination or other failures of glue bond of components.



3. Warping of casework components not resulting from leaks, flooding, or other uncontrolled moisture or humidity.
4. Failure of operating hardware.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Wenger Corporation; [www.wengercorp.com](http://www.wengercorp.com).
- B. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 CABINET SYSTEM**

- A. System Description:
  1. Modular instrument storage casework with integral bases, adjustable levelers, and through-bolted fastening, enabling owner reconfiguration of unit layout.
  2. Acoustically enhanced instrument storage casework finished with interior lining of sound-absorbent material providing sound absorption and noise reduction properties.
- B. Performance Requirements:
  1. Acoustically Enhanced Music Instrument Storage Casework Acoustic Properties:
    - a. Sound Absorption Average: Minimum SAA of 0.80, based upon sound absorption coefficient for twelve one-third octave bands from 200 to 2500 Hz, inclusive, with a minimum Noise Reduction Coefficient (NRC) of 0.75, per ASTM C 423 and ASTM E 795.
    - b. Acoustical Performance, One-third Octave Band Center Frequency, Hz, for four: 27 by 84 by 29 inch deep (606 by 2134 by 737 mm deep) units:

	<u>125</u>	<u>250</u>	<u>500</u>	<u>1000</u>	<u>2000</u>	<u>4000</u>
<u>Sound Absorption Coefficient</u>						
Mounting Type F65	1.08	0.71	0.86	0.77	0.75	0.68
<u>Sound Absorption, sabins/unit</u>						
Mounting Type F65	68.72	45.25	55.00	48.83	47.85	43.45
<u>Scattering Coefficient</u>						
	0.10	0.13	0.40	0.62	0.80	1.44

2. Storage Casework Component Load Capacities:
  - a. Storage Casework Wire-Grille Door Hinge: Each weld capable of resisting 400 lbf (1779 N) pull test without visible damage or permanent deformation.

### **2.03 MATERIALS**

- A. Particleboard: ANSI A208.1, minimum 45 lb/cu. ft. (721 kg/cu. m) density.
- B. Particleboard Thermoset Panels: Particleboard finished with thermally-fused polyester surfacing on both sides meeting performance properties of NEMA LD 3 for VGS grade, edge-banded, including the following:
  1. Surface Abrasion Resistance: Taber Wheel, 400 cycles, for solid colors.
- C. Polyethylene Shelves: High-density, one-piece, blow-molded or polyethylene, with radiused front edge, for abuse-resistant shelves.
- D. PVC Edge Banding: Radiused PVC extrusions, 3 mm thick.

### **2.04 INSTRUMENT STORAGE CASEWORK**

- A. General: Provide through-ventilating instrument storage casework meeting requirements in System Description and Performance Requirements Articles.
- B. Side Panels and Divider Panels: Particleboard thermoset panel with no urea formaldehyde added, 3/4 inch (19 mm) thick. Side panels machined to accept unit-to-unit through-bolting.
- C. Panel Edge Banding: 3 mm thick, heat-bonded, with radiused and profiled edges and corners.

- D. Grille Doors: Bright basic steel wire, 5/16 and 3/16 inch (7.9 and 4.8 mm) diameter, or 5/16 and 1/4 inch (7.9 and 6.3 mm) diameter for AcoustiCabinets, with full 360 degree welds at T-joints.
  - 1. Provide for Instrument Storage Casework
- E. Panel Edge Banding: 3 mm thick, heat-bonded, with radiused and profiled edges and corners.
- F. Shelving: Sized with adequate gap between shelving and casework side panels to allow air movement inside casework.
  - 1. Up to 27 inches (686 mm) wide: Removable molded polyethylene shelf, with impact-resistant, radiused front edge, mounted to cabinet wall with self-locking clip.
  - 2. Over 27 inches (686 mm) wide: For large instrument casework: Removable formed polyethylene shelf, ribbed, with high-impact-resistant, radiused front edge, supported by steel tube frame.
  - 3. Corner cabinet revolving shelving: 0.053 inch (1.3 mm) min. thickness steel sheet bolted to revolving steel center post, with radiused hardboard deflector panel.
- G. Casework Panel Color: As selected by Architect from manufacturer's standard colors.

## **2.05 ACCESSORIES**

- A. Filler Panels and Closure Kits: 3/4 inch (19 mm) thick particleboard thermoset panels with no urea formaldehyde added matching cabinet side panels. Provide the following, cut to fit field conditions, where indicated:
  - 1. Wall filler between cabinet side and wall.
  - 2. Top filler between cabinet top and wall.
  - 3. Top of cabinet closure panel between cabinet and finished ceiling or soffits.
  - 4. Finished back panel for exposed cabinet backs.

## **2.06 HARDWARE**

- A. Butt Hinges: 2-3/4 inch (70 mm), 5-knuckle steel hinges made from 0.090 inch (2.29 mm) thick metal, ANSI/BHMA A156.9, Grade 1, with powder-coated finish, through-bolted to door and side panels and welded to grille door frames. Provide 2 hinges on compartment doors, and 4 hinges on full-height doors.
- B. Slide Latch: 0.105 inch (2.67 mm) min. thickness steel, with padlock eye, powder-coat finish, through-bolted to panel door and side panel and welded to grille door frames. Latches securely without padlock. Provide with clear plastic label holder with numbering system. Padlocks furnished by Owner.
- C. Panel Connectors: 1/4-20 by 1.77 inch (45 mm) panel connectors, with steel thread inserts, powder coated to match panels.
- D. Cabinet Levelers: Leveling glides with 3/8 inch (9.5 mm) diameter threaded steel rod in steel corner brackets, minimum two each per cabinet side, accessible from within unit, and concealed in completed installation.
- E. Fasteners: Manufacturer-recommended fasteners as required for casework substrate and project performance requirements, consisting of one or more of the following:
  - 1. Sheet Metal Screws: SAE J78, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
  - 2. Wood Screws: ASME B18.6.1.
  - 3. Expansion Anchors in Concrete and Concrete Masonry Units: Carbon-steel, zinc plated.

## **2.07 FINISHES**

- A. Steel Sheet, Steel Wire, and Exposed Fasteners: Urethane-based electrostatic powder coating, color as indicated.
- B. Refer to Section 01 6210 - Schedule of Materials and Colors for approved color selection.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Examine casework installation areas for compliance with requirements for installation tolerances, location of blocking and other anchoring reinforcements, and other existing conditions affecting installation and performance of casework. Proceed with casework installation upon correction of unsatisfactory conditions.

### **3.02 CASEWORK INSTALLATION**

- A. Install plumb, level, and true; using integral levelers. Install in accordance with manufacturer's recommendations and approved submittals.
- B. Install hardware uniformly and precisely. Set hinges snug and flat. Adjust and align hardware so moving parts operate freely and contact points meet accurately. Allow for final adjustment after installation.
- C. Adjust casework and hardware so doors and drawers operate smoothly without warp or bind and close with uniform reveals.

### **3.03 CLOSEOUT ACTIVITIES**

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

### **3.04 CLEANING**

- A. Clean casework surfaces. Touch up, refinish, or replace damaged components in a manner acceptable to Architect.

### **3.05 PROTECTION**

- A. Protect work so that it will be without any evidence of damage or use at time of acceptance.
- B. Repair or replace defective work as directed by Architect upon inspection.
- C. Turn over operation and maintenance instructions to Owner.

**END OF SECTION**



**SECTION 12 3600  
COUNTERTOPS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Countertops for manufactured casework.
  - 1. Plastic Laminate Countertops.
  - 2. Solid Surfacing Countertops and Sills.
  - 3. Natural Quartz Countertops.

**1.02 RELATED REQUIREMENTS**

- A. Section 123200 - Manufactured Wood Casework.

**1.03 REFERENCE STANDARDS**

- A. ANSI/AWI 0641 - Architectural Wood Casework Standard 2019.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023b.
- C. ISFA 2-01 - Classification and Standards for Solid Surfacing Material 2013.
- D. ISFA 3-01 - Classification and Standards for Quartz Surfacing Material 2013.
- E. MIA (DSDM) - Dimensional Stone Design Manual, Version VIII 2016.
- F. NEMA LD 3 - High-Pressure Decorative Laminates 2005.
- G. PS 1 - Structural Plywood 2019.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Specimen warranty.
- C. Shop Drawings: Complete details of materials and installation and countertop seaming ; combine with shop drawings of cabinets and casework specified in other sections.
- D. Verification Samples: For each finish product specified, minimum size 6 inches square, representing actual product, color, and patterns.
- E. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

**1.05 MOCK-UPS**

- A. Provide as part of casework specified in 12 3200-Manufactured Wood Casework.

**1.06 QUALITY ASSURANCE**

- A. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience and approved by manufacturer.
- B. Perform cabinet construction in accordance with ANSI/AWI 0641 - Architectural Woodwork Standards.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

## 1.08 FIELD CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

## PART 2 PRODUCTS

### 2.01 COUNTERTOPS

- A. Quality Standard: See Section 12 3200.
- B. Plastic Laminate Countertops: High-pressure decorative laminate (HPDL) sheet bonded to substrate.
  - 1. Laminate Sheet: NEMA LD 3, Grade HGS, 0.048 inch nominal thickness.
    - a. Manufacturers:
      - 1) Arborite: [www.arborite.com/#sle](http://www.arborite.com/#sle).
      - 2) Formica Corporation: [www.formica.com/#sle](http://www.formica.com/#sle).
      - 3) Lamin-Art, Inc: [www.laminart.com/#sle](http://www.laminart.com/#sle).
      - 4) Panolam Industries International, Inc\Nevamar: [www.nevamar.com](http://www.nevamar.com).
      - 5) Panolam Industries International, Inc\Pionite: [www.pionite.com](http://www.pionite.com).
      - 6) Wilsonart: [www.wilsonart.com/#sle](http://www.wilsonart.com/#sle).
      - 7) Substitutions: See Section 01 6000 - Product Requirements.
    - b. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
    - c. NSF approved for food contact.
    - d. Wear Resistance: In addition to specified grade, comply with NEMA LD 3 High Wear Grade requirements for wear resistance.
    - e. Finish: Matte or suede, gloss rating of 5 to 20 or as scheduled in the Schedule of Materials and Colors.
    - f. Surface Color and Pattern: See Drawings and Section 01 6210 - Schedule of Materials and Colors.
  - 2. Exposed Edge Treatment: 3 mm Molded PVC edge with T-spline, sized to completely cover edge of panel.
    - a. Color: Color match to face laminate.
  - 3. Back and End Splashes: Same material, same construction.
  - 4. Fabricate in accordance with manufacturer's standard requirements.
- C. Solid Surfacing Countertops and Sills: Solid surfacing sheet or plastic resin casting self-supporting over structural members.
  - 1. Flat Sheet Thickness: 1/2 inch, minimum.
  - 2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
    - a. Manufacturers:
      - 1) Avonite Surfaces: [www.avonitesurfaces.com/#sle](http://www.avonitesurfaces.com/#sle).
      - 2) Dupont: [www.corian.com/#sle](http://www.corian.com/#sle).
      - 3) Formica Corporation: [www.formica.com/#sle](http://www.formica.com/#sle).
      - 4) Meganite, Inc: [www.meganite.com/#sle](http://www.meganite.com/#sle).
      - 5) Relang International, LLC: [www.duraseinusa.com/#sle](http://www.duraseinusa.com/#sle).
      - 6) Wilsonart: [www.wilsonart.com/#sle](http://www.wilsonart.com/#sle).
      - 7) Substitutions: See Section 01 6000 - Product Requirements.
    - b. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
    - c. NSF approved for food contact.

- d. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20 or as scheduled in the Schedule of Materials and Colors.
  - e. Color and Pattern: As Scheduled.
- 3. Exposed Edge Treatment: Built up to minimum 1-1/4 inch thick; square edge.
- 4. Back and End Splashes: Same sheet material, 1/2 inch thick maximum, square top; minimum 4 inches high.
- 5. Fabricate in accordance with manufacturer's standard requirements.
- D. Natural Quartz and Resin Composite Countertops: Sheet or slab of natural quartz and plastic resin self-supporting over structural members.
  - 1. Flat Sheet Thickness: 3/4 inch, minimum.
  - 2. Natural Quartz and Resin Composite Sheets, Slabs and Castings: Complying with ISFA 3-01 and NEMA LD 3; orthophthalic polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
    - a. Manufacturers:
      - 1) Cambria Company LLC: [www.cambriausa.com/#sle](http://www.cambriausa.com/#sle).
      - 2) Dal-Tile Corporation: [www.daltile.com/#sle](http://www.daltile.com/#sle).
      - 3) Terrazzo & Marble Supply Companies: [www.tmsupply.com/#sle](http://www.tmsupply.com/#sle).
      - 4) Dupont: [www.corian.com/#sle](http://www.corian.com/#sle).
      - 5) Wilsonart: [www.wilsonart.com/#sle](http://www.wilsonart.com/#sle).
      - 6) Substitutions: See Section 01 6000 - Product Requirements.
    - b. Factory fabricate components to the greatest extent practical in sizes and shapes indicated; comply with the MIA Dimension Stone Design Manual.
    - c. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
    - d. NSF approved for food contact.
    - e. Finish on Exposed Surfaces: See Drawings and Section 01 6210 - Schedule of Materials and Colors.
    - f. Color and Pattern: As Scheduled.
  - 3. Exposed Edge Treatment: Built up to minimum 1-1/4 inch thick; square edge.
  - 4. Back and End Splashes: Same sheet material, 1/2 inch thick maximum, square top; minimum 4 inches high.
  - 5. Fabricate in accordance with manufacturer's standard requirements.

## **2.02 MATERIALS**

- A. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch thick; join lengths using metal splines.
- B. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.
- C. Joint Sealant: Mildew-resistant silicone sealant, color to match counter.

## **2.03 FABRICATION**

- A. All corners shall have smooth, eased or chamfered edges. No sharp corners allowed.
- B. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
  - 1. Join lengths of tops using best method recommended by manufacturer.
    - a. No splices on countertop plastic laminate material less than 144" will be permitted.
  - 2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
  - 3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
- C. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated on drawings.

1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
  2. Height: 4 inches, unless otherwise indicated.
- D. Solid Surfacing: Fabricate tops up to 144 inches long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.
- E. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings and finished as scheduled..

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

#### **3.02 PREPARATION**

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

#### **3.03 INSTALLATION**

- A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
- B. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch.
- C. Seal joint between back/end splashes and vertical surfaces.

#### **3.04 TOLERANCES**

- A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.
- B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.
- C. Field Joints: 1/8 inch wide, maximum.

#### **3.05 CLEANING**

- A. Clean countertops surfaces thoroughly.

#### **3.06 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

### **END OF SECTION**



**SECTION 12 6100  
FIXED AUDIENCE SEATING**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Fixed, upholstered theater chairs.
- B. Support standards.
- C. Chair accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 12 6300 - Stadium and Arena Seating.
- B. Section 12 6613 - Telescoping Bleachers.
- C. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables.
- D. Section 26 0533.23 - Surface Raceways for Electrical Systems.

**1.03 REFERENCE STANDARDS**

- A. ADA Standards - 2010 ADA Standards for Accessible Design 2010.
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- C. ASTM A48/A48M - Standard Specification for Gray Iron Castings 2022.
- D. ASTM A879/A879M - Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface 2022.
- E. ASTM D3597 - Standard Performance Specification for Woven Upholstery Fabrics—Plain, Tufted, or Flocked 2002, with Editorial Revision (2018).
- F. ASTM E1352 - Standard Test Method for Cigarette Ignition Resistance of Mock-Up Upholstered Furniture Assemblies 2016.
- G. ASTM E1537 - Standard Test Method for Fire Testing of Upholstered Furniture 2022.
- H. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood 2020.
- I. NEMA LD 3 - High-Pressure Decorative Laminates 2005.
- J. NFPA 261 - Standard Method of Test for Determining Resistance of Mock-Up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes 2023.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination with Electrical Work: Coordinate installation of wiring to ensure that floor-mounted junction boxes are completely beneath seats and free of aisle spaces.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed data sheets for products specified, including:
  - 1. Materials list of items proposed to be provided under this Section.
  - 2. Manufacturer's recommended installation procedures which, when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.
- C. Shop Drawings: Fabrication and installation details, chair layouts and dimensions.
  - 1. Field Measurements: Verify seating layout by field measurements and record field dimensions on shop drawings.
- D. Seat Numbering Schedule: Provide information sufficient to completely define each seat number for fabrication, including number, any other text to be applied, letter sizes, fonts, and colors.

1. Request any specific content or numbering sequence from Owner through Architect; upon request, submit preliminary schedule.
2. Submit for approval by Owner through Architect prior to fabrication.
- E. Selection Samples: Manufacturer's color charts and swatches for fabric upholstery, indicating full range of materials, colors, and patterns available.
- F. Verification Samples: Full-size two-seat fabricated sample of each type of chair specified, including all accessories and one end panel, illustrating all finishes and workmanship to be expected in the finished Work; approved sample may be incorporated into the Work.
- G. Maintenance Materials:
  1. See Section 01 6000 - Product Requirements, for additional provisions.
  2. Extra Seats: Quantity equal to 5 percent of total installed, but not less than one of each type and width of seat, furnished from same production run as that installed.
  3. Extra Fabric: Quantity sufficient for reupholstering 5 percent of installed seating.

#### **1.06 QUALITY ASSURANCE**

- A. Installer Qualifications: An experienced installer certified in writing by the seating manufacturer to be qualified for installation of specified seating.
- B. Fire Retardance of Upholstered Seating: Self-extinguishing when mock-up is exposed to smoldering cigarettes in accordance with ASTM E1352 or NFPA 261.
- C. Fire Retardance of Fixed Theater Seating: Maximum instantaneous net peak rate of heat release of 250 kW or less, and total energy released during first 5 minutes of 40 MJ or less, when tested in accordance with ASTM E1537.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver seats to project site in unopened containers clearly labeled with manufacturer's name and identification of contents.
- B. Store seating units in dry and clean location until needed for installation. During installation, handle in a manner that will prevent marring and soiling of finished surfaces.
- C. Comply with pertinent provisions of Section 01 6000 - Product Requirements; Transportation, handling, storage and protection requirements.

#### **1.08 MOCK-UP**

- A. See Section 01 4000 - Quality Requirements, for additional mock-up requirements.
- B. Construct mock-up with at least 2 seats in each of 2 rows at location indicated.
- C. Approved mock-up will serve as quality standard for completed installation.
- D. Approved mock-up may remain as part of the Work.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Fixed Theater Seating:
  1. Hussey Seating Company: [www.husseyseating.com](http://www.husseyseating.com).
  2. Irwin Seating Co.: [www.irwinseating.com](http://www.irwinseating.com).
  3. KI Seating: [www.ki.com](http://www.ki.com)
- B. Substitutions: See Section 01 6000 - Product Requirements.
- C. Provide all theater seating by one manufacturer.
- D. See Drawings for Schedule of Materials and Colors for specific products listed as basis of design and additional information.

## **2.02 MATERIALS**

- A. Sheet Steel: ASTM A879/A879M, Commercial Steel (CS) or Drawing Steel (DS) electrogalvanized sheet, 04Z (12G) coating class on both surfaces; chemically treated for baked enamel finish.
- B. Steel Plates, Bars, and Tubes: ASTM A36/A36M.
- C. Exposed Hardwood: Solid lumber selected for absence of visible defects; species standard with manufacturer.
- D. Hardwood Plywood: HPVA HP-1; face veneers for exposed surfaces Grade A as standard with manufacturer, with no visible defects; concealed surface veneers of sound grade hardwood.
- E. Polyurethane Foam: Density not less than 1.8 lb/cu ft, fire retardant, non-hardening and non-oxidizing, with high resistance to alkalis, oils, moisture, and mildew.
- F. Upholstery Fabric: See Drawings for Schedule of Materials and Colors for specific products listed as basis of design and additional information.

## **2.03 UPHOLSTERED CHAIRS**

- A. Fixed seating system designed to permit radial installation using common middle support standards in each row and aisle standards aligned as indicated on drawings. Width of seats not less than 22 inches, except exit seat locations may be reduced to 20 inches to complete specific row dimensions.
- B. Backs: Fixed type; two-panel construction with fabric covering over padding and protective back panel, with installed height not less than 32 inches above finished floor.
  - 1. Structural Support: Molded hardwood plywood, not less than 5 ply and 3/8 in thick.
  - 2. Padding: Polyurethane foam not less than 1 in thick bonded to structural support.
  - 3. Covering: Fabric bonded to padding and fastened by upholstery technique that facilitates replacement.
- C. Seats: Hinged type, constructed to permit reupholstering without removing seat from chair.
- D. Hinges: Self-lubricating, noiseless steel hinges with brass alloy bearings or nylon bushings, equipped with spring mechanism that causes unoccupied seat to rise automatically to uniform 3/4 fold, with 100 percent fold when additional pressure is applied.
- E. Arm Rests: Locate at aisles and between chairs; mount to support standard with concealed fasteners; exposed surfaces of solid hardwood lumber with smoothed edges.
- F. End Panels: One piece panels fastened securely to aisle standards with concealed fasteners, configured as follows:
  - 1. Shape: Rectangular.
  - 2. Finish: Solid hardwood.

## **2.04 STANDARDS**

- A. Support Standards: Tubular steel with welded mounting points for backs, seats, and arm rests, and welded floor anchor plates.

## **2.05 ACCESSORIES**

- A. Aisle Lights: Manufacturer's standard UL-approved concealed lamp assemblies, with louvers to conceal lamp and direct light toward floor, mounted beneath aisle arm rest; wiring route concealed to floor connection.
- B. Seat and Aisle Numbers: Manufacturer's standard seat numbers securely fastened to front edge of folding seats and row numbers securely fastened to aisle arm rests; anodized aluminum finish, with letters and numbers countersunk and filled with black paint.

## **2.06 FINISHES**

- A. Ferrous Metals: Manufacturer's standard two-coat baked enamel finish, applied over conversion coating appropriate to base metal.

- 1. Color and Gloss: See Section 01 6210 - Schedule of Materials and Colors.
- B. Hardwood: Manufacturer's standard clear low-gloss finish.
- C. Hardwood Plywood: Manufacturer's standard clear low-gloss finish.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine substrates for conditions detrimental to installation of fixed theater seating. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.02 INSTALLATION**

- A. Comply with manufacturer's installation instructions and approved shop drawings.
- B. Anchor support standards securely to substrate with at least two anchoring devices recommended by manufacturer.
  - 1. In curved rows, install standards to form smooth radius, without breaks or angled chords
  - 2. Attach components to standards with sufficient flexibility to compensate for convergence of seats toward the center.
- C. Upon completion of the installation, touch-up all scratches and abrasions to be completely invisible to the unaided eye from a distance of five feet.

#### **3.03 ADJUSTING**

- A. Adjust seat mechanisms to ensure that seats in each row are aligned when unoccupied.
- B. Repair minor abrasions and imperfections in painted finishes with a coating that matches factory-applied finish; replace units that cannot be repaired to unblemished appearance.
- C. Replace upholstery fabric damaged or soiled during installation.

#### **3.04 CLOSEOUT ACTIVITIES**

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

**END OF SECTION**

**SECTION 12 6613  
TELESCOPING BLEACHERS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Telescoping bleachers.

**1.02 RELATED REQUIREMENTS**

- A. Division 01 for Accessible Seating Requirements
- B. Section 08 7100 - Door Hardware for door hardware for key cylinder.
- C. Division 09 finishes sections for adequate floor and wall construction. Flooring shall be level and rear wall plumb with 1/8" in 8'-0".

**1.03 REFERENCE STANDARDS**

- A. NFPA 102 - Standard for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures 2021.
- B. PS 1 - Structural Plywood 2019.
- C. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2023).
- D. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel 2018, with Errata (2022).

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage handling and requirements.
  - 3. Installation methods.
- C. Shop Drawings: Complete layout with dimensions, seat heights, row spacing and rise, aisle widths and locations, points of connection to substrate, assembly dimensions, and material types and finishes.
  - 1. Provide drawings customized to this project.
  - 2. Include Professional Engineer's seal on each sheet.
  - 3. Wiring Diagrams: Show locations of motors, electrical wiring, and rough-in connections.
  - 4. Graphics Layout Drawings: Indicate pattern of all seat colors.
- D. Shop drawing sheets that include engineering information designed by the Contractor's Delegated Design Engineer shall be signed and sealed in accordance with the Texas Engineering Practice Act. Sheets that do not provide information designed by the Contractor's Engineer do not require being signed and sealed. Calculation packages require a signed and sealed cover sheet only. Any submittals requiring to be signed and sealed that are received without the signature and seal will be rejected without review.
- E. Selection Samples: For each material for which color selection is required, submit samples, 2 by 2 inches in size, illustrating colors and finishes available.
- F. Verification Samples: For each custom colored finish, submit samples of actual finish or product, for verification of color selection.
- G. Operation and Maintenance Data: Manufacturer's operation and maintenance instructions, including annual inspection and maintenance and bi-annual inspection by a Professional Engineer or manufacturer factory service personnel.
- H. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

### **1.05 QUALITY ASSURANCE**

- A. Designer Qualifications: Perform design under direct supervision of a Professional Engineer experienced in design of this type of work.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- C. Installer Qualifications: Manufacturer's installation crew.
- D. Welder Qualifications: Certified by AWS for the process employed.

### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Store, in original packaging, under cover and elevated above grade.

### **1.07 WARRANTY**

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion. Replace parts that fail under normal use at no extra charge to Owner.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Telescoping Bleachers:
  - 1. Hussey Seating Company: [www.husseyseating.com/#sle](http://www.husseyseating.com/#sle).
  - 2. Interkal LLC: [www.interkal.com/#sle](http://www.interkal.com/#sle).
  - 3. Irwin Telescopic Seating Company: [www.irwintelescopicseating.com/#sle](http://www.irwintelescopicseating.com/#sle).
  - 4. Substitutions: See Section 01 6000 - Product Requirements.

### **2.02 TELESCOPING BLEACHERS**

- A. Basis of Design: Hussey Seating Company; MAXAM 26 Series Telescopic Gym Seat System.
- B. Telescoping Bleachers: Factory assembled tiered benches that retract horizontally into depth approximately the same as a single row depth, with fixed seats mounted on leading edge of platforms.
  - 1. Provide a design certified by a licensed Professional Engineer licensed in Texas.
  - 2. Design to comply with applicable requirements of NFPA 102 and requirements of code authorities having jurisdiction; where conflicts between requirements occur, comply with whichever is more stringent.
  - 3. Design with solid fascia (riser) or seat fronts that conceal interior mechanisms when fully retracted, fitting tightly enough to prevent climbing up face; at front row provide key locked, hinged fascia (skirt) to cover gap between seat riser/fascia and floor.
  - 4. Configurations: As indicated on Drawings.
  - 5. Wheelchair Spaces: Permanent open spaces at locations as per requirements of (ADA) American with Disability Act / (TAS) Texas Accessibility Standards.
  - 6. Cutouts: Fit units to irregular wall surfaces, columns, pilasters, and other obstructions; take field measurements prior to fabrication.
  - 7. Operation: Motor operated.
- C. Design Loads: Design to withstand the following loading conditions:
  - 1. Live Load on Structural Supports: 100 psf, minimum, of gross horizontal projection.
  - 2. Live Load on Seats and Walking Surfaces: 120 pounds per linear foot.
  - 3. Lateral Sway Stress on Structural Supports: 24 pounds per linear foot of seat plank.
  - 4. Perpendicular Sway Stress on Structural Supports: 10 pounds per linear foot of seat plank.
- D. Dimensions:

1. See Contract Drawings for overall dimensions, row count and approximate number of seats requested. Seating supplier shall design and determine the actual number of seats available based on allowable space and handicap seating reductions required. If actual number of seats differs from that requested, notify the Architect immediately.
  2. Rows: Reference drawings.
  3. Rise Per Row: 9 5/8 inches.
  4. Row Depth: 26 inches.
- E. Structural Supports: Steel or aluminum; manufacturer's standard wheeled carriages supporting each tier separately, with moving parts permanently lubricated and metal parts cushioned to prevent metal-to-metal contact during operation.
1. Design so that each row carriage so that it will individually support the design loads and is self supporting when fully assembled without dependence on platform panels or boards, seats, or fascia.
  2. Welding: In accordance with AWS D1.1/D1.1M and AWS D1.3/D1.3M.
  3. Bolting: Use lock-washers or locknuts.
  4. Wheels: Minimum 5 inch diameter by 1-1/8 inch wide, with non-marring rubber tires; ball, roller, or oil-impregnated metal bearings; minimum of 2 wheels at each floor support.
  5. Finish: Manufacturer's standard enamel or powder coating.
  6. Row Locking: Automatically mechanically lock each carriage to adjacent carriages when fully extended.
  7. Unlocking: Automatically unlock all rows before engaging retraction mechanism.
- F. Motor Operation: Manufacturer's standard drive mechanism, using motor adequately sized for the purpose.
1. Provide UL listed electrical components and wiring.
  2. Controls: Start, Stop, Forward, and Reverse in a single control unit.
  3. Control Station: Removable plug-in low-voltage pendant station, with first-row plug-in location for each motor.
  4. Limit Switches: Automatically stop operation when unit has reached fully open or fully closed position.
  5. Provide all wiring internal to bleacher units, to junction box located on back wall; ensure that wiring is not energized except during operation.
  6. Electrical Characteristics: 208/230V 5 wire 3-phase, 60 Hz.

### **2.03 SEAT AND PLATFORM COMPONENTS**

- A. Seat/Fascia Assembly: Continuous, molded high-density polyethylene plastic, seat minimum 1 inch thick, textured finish, homogeneous color throughout, color as selected from manufacturer's standard selection; approximately 18 inch long sections independently removable with tongue-and-groove or rabbeted interlock at end joints.
1. Basis of Design: CourtSide XC10 by Hussey Seating Company.
  2. Shape: Ergonomically contoured, with internal ribs spaced for natural flexibility; rear edge cantilevered to provide toe room of not less than 3 inches; no openings to trap debris.
  3. Supports: Internal steel reinforcement of each seat segment bolted to platform nose member; minimum two bolts per segment.
  4. Seat and Row Numbers: Provide recessed pockets and number plates.
- B. Platform, Tread, and Step Structure: Plywood continuously supported on front and rear with side joints tongue-and-grooved.
1. Plywood: PS 1, 5-ply southern pine or polyethylene-overlaid douglas fir or southern pine, Grade A-C.
  2. Plywood Thickness: 5/8 inch, minimum.
  3. Front (Nose), Rear, and Intermediate Supports: Steel channel or tube, hot-dipped galvanized.
  4. Provide end caps of same material and finish on each exposed end.
  5. Finish: High gloss clear urethane, unless polyethylene finished.

6. Nosings: Formed steel, , minimum, G60/Z275 hot-dipped galvanized.
7. At aisles provide permanently attached intermediate steps of same construction and finish.
8. At bottom of aisles provide step in front of first riser, removable for storage.

#### **2.04 HANDRAILS AND RAILINGS**

- A. Provide the following railings:
  1. Aisle Handrails: Single post folding railing segment mounted in center of aisle at every other row beginning at row 2.
  2. End of Row Guardrails: Self-storing, at open ends of sections beginning at row 2.
  3. Height: 42 inches above adjacent platform or tread.
  4. Removable Railings: Provide steel post sockets attached to platform supports.
- B. Design handrails and railings to withstand the following loads:
  1. Concentrated Load on Handrails: 200 pounds in any direction.
  2. Concentrated Load on Guardrails: 200 pounds in any direction along top rail.
  3. Live Load on Handrails: 50 pounds per linear foot, applied in any direction.
  4. Live Load on Guardrails:
    - a. Horizontal: 50 pounds per linear foot, applied at the guardrail height.
    - b. Vertical: 100 pounds per linear foot, applied vertically to top of guardrail.
- C. Railing Construction: Round steel pipe or tube, self storing, with formed elbows at corners and caps at ends of straight runs.
  1. Provide steel self-storing starting no higher than tier 2, 42 inches high above seat, end rail with tubular supports and intermediate members designed with 4 inch sphere passage requirements..
  2. Material and Finish: Powder coated steel as selected by Architect from manufacturers full line of colors.

#### **2.05 ACCESSORIES**

- A. Fillers and Closures:
  1. Top Row: Provide seat level rear filler panels to close openings between top row seat and wall; finish to match platforms.
- B. Fasteners: Provide hardware and fasteners in accordance with manufacturer's recommendations.
- C. Anchorage: As indicated on drawings; provide hardware in accordance with manufacturer's recommendations.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that field measurements are consistent with those on the shop drawings.
- B. Verify that electrical rough-ins have been installed and are accessible.
- C. Do not begin installation until substrates have been properly prepared and area has been cleared of obstructions.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

#### **3.02 PREPARATION**

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

#### **3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.



- B. Do not field cut or alter seats, fascia, or structural members without approval.
- C. Provide manufacturer's field representative to inspect completed installation.

**3.04 ADJUSTING**

- A. Lubricate, test, and adjust each moving assembly to ensure proper operation in compliance with manufacturer's recommendations.

**3.05 CLEANING**

- A. Clean exposed and semi-exposed assembly surfaces.
- B. Touch up finishes on damaged or soiled areas.

**3.06 CLOSEOUT ACTIVITIES**

- A. Demonstration and Training: Provide manufacturer's field representative to demonstrate to and train Owner's operating personnel in proper operation of equipment.
  - 1. Location: On site using installed equipment.
  - 2. Time: As agreed between Owner and Contractor.

**3.07 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair, or replace damaged products before Date of Substantial Completion.

**END OF SECTION**



**SECTION 12 9313  
BICYCLE RACKS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Bicycle racks.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 3000 - Cast-in-Place Concrete: Mounting surface for bicycle racks.

**1.03 REFERENCE STANDARDS**

- A. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2022.

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- C. Shop Drawings: Indicate size, shape, and dimensions, including clearances from adjacent walls, doors, and obstructions.
- D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Handle racks with sufficient care to prevent scratches and other damage to the finish.

**1.06 WARRANTY**

- A. The contractor shall furnish a written guarantee warranting all materials, devices, and workmanship to be free of defects for a period of one year from the date of completion and acceptance. Any defects in materials, devices, and workmanship which become apparent within the guarantee period shall be repaired or replaced by the contractor at his own expense, and at no additional cost to the Owner.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Bicycle Racks:
  - 1. Columbia Cascade Company: [www.timberform.com](http://www.timberform.com).
  - 2. Creative Pipe, Inc: [www.creativepipe.com](http://www.creativepipe.com).
  - 3. Highland Products Group, LLC: [www.indoorbikeracks.net](http://www.indoorbikeracks.net).
  - 4. Huntco Supply, LLC: [www.huntco.com](http://www.huntco.com).
  - 5. Neenah Foundry, a division of Neenah Enterprises, Inc: [www.nfco.com](http://www.nfco.com).
  - 6. Substitutions: See Section 01 6000-Product Requirements.

**2.02 BICYCLE RACKS**

- A. Bicycle Racks: Device allows user provided lock to simultaneously secure one wheel and part of the frame on each bicycle parked or racked.
  - 1. Style: Serpentine rack formed from a continuous round pipe.
  - 2. Capacity: 18 bicycles.
  - 3. Mounting, Ground: In-ground anchor
  - 4. Accessories: In-ground grout cover.
  - 5. Finish: Powder coat, maintenance-free and weather-resistant

- 6. Color: See Section 01 6210 - Schedule of Materials and Colors.
- B. Materials:
  - 1. Pipe: Carbon steel, ASTM A53/A53M, Schedule 40.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Examine surfaces to receive bicycle racks.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Do not begin installation until unsatisfactory substrates have been properly repaired.

#### **3.02 PREPARATION**

- A. Ensure surfaces to receive bicycle racks are clean, flat, and level.

#### **3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install bicycle racks level, plumb, square, and correctly located as indicated on drawings.
- C. Surface Flange Installation: Anchor bicycle racks securely in place with 1/2 inch by 4 inch anchor bolts through flange holes.

#### **3.04 CLEANING**

- A. Clean installed work to like-new condition. Do not use cleaning materials or methods that could damage finish.

#### **3.05 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

**END OF SECTION**



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