LEGAT ARCHITECTS

ESTES CONSTRUCTION

Project Manual
Volume 1: Front End & Architectural
ARCHITECT'S PROJECT NUMBER **224150.00**

Moline-Coal Valley School District
Lincoln-Irving Addition and Renovation

1015 16th Avenue, Moline, IL 61265

FOR THE
Board of Education
Moline – Coal Valley School District
1900 52nd Avenue
Moline, IL 61265

Issued for Bidding
October 23, 2025

Lincoln-Irving Addition and Renovation

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INVITATION TO BID

Estes Construction invites bids for the Moline-Coal Valley School District: Lincoln Irving Addition and Renovation for the following Bid Package list:

Bid Package A: General Trades
Bid Package B: Concrete
Bid Package C: Precast Concrete
Bid Package D: Masonry
Bid Package E: Steel Furnished and Installed
Bid Package F: Roofing and Sheet Metal
Bid Package G: Storefronts and Curtain Walls
Bid Package H: Studs, Drywall, Acoustical, Painting
Bid Package I: Kitchen Equipment
Bid Package J: Fire Protection
Bid Package K: Mechanical & Plumbing
Bid Package L: Electrical
Bid Package M: Earthwork, Site Utilities, and Building Demolition

Bid Documents will be available on **October 23, 2025** via ISQFT or can be viewed at Estes Construction's Office located at 131 W. 2nd Street, Suite 400, Davenport, IA 52801, and City Blue Technologies 4653 44th Street, Rock Island, IL 61201.

The CM will receive Bids until 2:00 PM, Central Time, on November 20, 2025 at the Moline-Coal Valley School District – 1900 52nd Avenue, Moline, IL 61265.

Bids will be opened publicly and awarded per bid package as listed above. Bidders may submit bids on multiple bid packages, but shall submit separate bid forms and documentation for each package being proposed on. Combination Bids will not be accepted. Bids must be submitted for complete Bid Package scopes of work only, no other bids we be considered for partial scopes of work.

A non-mandatory but recommended pre-bid meeting is scheduled for November 3, 2025 at the site, 1015 16th Avenue, Moline, IL 61265, followed by a site visit. This meeting is scheduled to start at 3:30 PM at the Gymnasium.

Construction is scheduled to begin April 6, 2026 and be complete not later than June 30, 2027.

Working hours shall be performed 7:00AM – 3:30PM Monday through Friday and shall be bid accordingly to meet proposed schedule.

Prevailing Wages per State of Illinois for Rock Island County.
Certified Payroll is required for all Bidders.
IMPACT Memorandum of Understanding is required and attached herein for reference.
Sales tax exempt for all Bidders.
100% Performance Bond and Labor and Material Payment Bond are required by each Bid Package proposal.
Bid security in the amount of 10% is required as indicated in the supplemental instructions to bidders.
Apparent low bidders will participate in a Post Bid Interview, and will use Procore for electronic management, provide daily Job Hazard Analysis reports and Hot Work Permits as required for their scopes of work.

END OF SECTION

SECTION 00 21 13
INSTRUCTIONS TO BIDDERS

American Institute of Architects Document A701 – 2018, Instructions to Bidders is hereby incorporated in this section for reference. The Instruction to Bidders, including modifications and special instructions, shall apply to all Bidders and their Sub-Bidders.

END OF SECTION

SECTION 00 22 13
SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

The following supplements modify, change, delete from or add to the “Instructions to Bidders”, AIA Document A701, 2018 Edition. Where any Article of the Instructions is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.

ARTICLE 3: BIDDING DOCUMENTS

1. Paragraph 3.2 Modification or Interpretation of Bidding Documents
   A. Sub-paragraph 3.2.2; replace with the following:
      "An ambiguity, inconsistency, or error discovered too late to be clarified or interpreted by Addendum shall be handled in the following manner:
      .1 The Bidder or Sub-bidder shall promptly notify the Construction Manager.
      .2 The Bidder or Sub-bidder shall determine, to the best of his ability, the proper methods or materials required to fulfill the design intent of the Architect and shall include the cost of providing such methods or materials in this Bid or Sub-bid.
      .3 The Owner, Construction Manager, and Architect will review the supplemental information prior to awarding the Contract."
      .4 Direct questions to the Construction Manager: Brian Rossmiller, Estes Construction; telephone: (563) 322-7301; e-mail: bids@estesconstruction.com.

2. Paragraph 3.3 Substitutions
   A. Sub-paragraph 3.3.2; add the following:
      ".1 All substitution requests shall be submitted on the Substitution Request Form included in the Project Specification Manual. All substitution requests submitted must be complete with all requested information. Incomplete forms and requests submitted on other forms shall be disregarded.”

3. Paragraph 3.4 Addenda
   A. Paragraph 3.4.3; add the following to the end of paragraph:
      ".....or in a case deemed an emergency by the Architect, Owner, or Construction Manager."

ARTICLE 4: BIDDING PROCEDURES

1. Paragraph 4.1 Preparation of Bids
   A. Sub-paragraph 4.1.1; add the following sentence:
      1. "Bidders shall include an original copy of the Bid in the submittal envelope."

2. Paragraph 4.2 Bid Security
   A. Sub-paragraph 4.2.1; add the following:
      "4.2.1.1 Bid Security in the amount of10% of the Bid shall be presented as:
      .1 A certified check on a solvent Illinois bank, made payable to the Owner; or,
      .2 A surety bond from a surety company authorized to do business in the state of Illinois
   B. Sub-paragraph 4.2.4; revise final sentence as follows:

1. However, if no Contract has been awarded or a Bidder has not been notified of the acceptance of its Bid, a Bidder may, beginning 45 days after the opening of Bids, withdraw its Bid and request the return of its bid security."

3. Paragraph 4.3 Submission of Bids

A. Sub-paragraph 4.3.1; delete this paragraph and add the following:

"4.3.1 Bids and required submittals shall be presented in two separate sealed opaque envelopes identified with the Project title, the Bidder's name, bid package number and description, and a list of the contents. The contents of the envelopes shall be as follows:

.1 Envelope No. One shall contain the Bid Security.

.2 Envelope No. Two shall contain the original Bid.

Attach Bid Security in a manner to permit inspection without exposing the Bid, in separate envelope clearly marked "BID SECURITY" with bidder's name and project name on the outside.

The envelopes shall be noted "SEALED BID ENCLOSED FOR LINCOLN IRVING ELEMENTARY SCHOOL" and clearly indicate bid package number and description.

Bids submitted via mail shall be clearly marked "SEALED BID ENCLOSED FOR LINCOLN IRVING ELEMENTARY SCHOOL" and clearly indicate bid package number and description.

B. Sub-paragraph 4.3.6; add the following:

"4.3.6 Bids shall remain in force and effect for forty-five (45) days after opening of the Bid.

4. Paragraph 4.4 Modification or Withdrawal of Bid

A. Sub-paragraph 4.4.3; add the following:

"4.4.3.1 At the Owner's discretion, If the withdrawn bid is the low bid, the Owner will retain a portion of the bid security equal to the difference between the low bid and the next-lowest bid. This amount of the bid security shall be forfeited to the Owner which the Owner will sustain resulting from failure, neglect, or refusal of the Bidder to deliver a signed contract stipulating the scope and performance of the Work as defined in the Bid Documents. Contract will include unqualified compliance with the Contract Documents as bid and must be executed within fourteen (14) calendar days after the notification of award is issued."

ARTICLE 6: POST-BID INFORMATION

1. Sub-paragraph 6.3.1; delete “as soon as practicable or as stipulated in the Bidding Documents” and insert “within three (3) business days.”

2. Sub-paragraph 6.3.1, add the following:

   “6.3.4 The successful Bidders shall, within 48 hours of receipt of “Owner’s Notice of Intent to Award a Contract,” shall provide to the Construction Manager a list of all Subcontractors selected to perform work on this project. The Subcontractor list shall include each firm’s name, tax identification number, and address.”

3. Add the following under Article 6 Post-Bid Information

   “6.4 Post-Bid Interview

   Each bidder being considered for a contract award will participate in a Post-Bid Interview with the Construction Manager. The interview will consist of the following:

   Review and verification of the scope of work by the Bidder.
   Define anticipated schedule and duration of work.
   Review anticipated workforce required to complete the Work within the scheduled time.
   Meet and interview the Bidder’s proposed project team members.
   Review the Bidder’s approach to constructing the project.
   Discuss proposed material manufacturers and/or Subcontractors of the Bidder.
   Review anticipated dates and duration requirements for submittals, fabrication, and delivery of materials.
   Review anticipated means and methods to construct the Project.
   Review anticipated safety measures required to construct the Project.
   Review special project requirements to meet the needs of the Owner.

   The Construction Manager shall schedule the interviews, provide the forms to be completed by the Bidder, and document the interviews. This information shall be included as part of the Contract with the successful Bidder.”

ARTICLE 7: PERFORMANCE BOND AND PAYMENT BOND

1. Paragraph 7.1 Bond Requirements

   A. Sub-paragraph 7.1.1; delete this paragraph and add the following:

   "7.1.1 For furnishing bonds, the Bidder shall furnish bonds covering the faithful performance of the Contract and the payment of all obligations arising thereunder in an amount equal to the total Contract Sum. Bonds may be secured through the Bidder's usual sources. The cost of the Bonds shall be included in the Base Bid."

ARTICLE 8: ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

1. Subparagraph 8.1.5 Drawings: Add the following: “Refer to Index on Drawing Cover Sheet.”

2. Subparagraph 8.1.6 Specifications: Add the following: “Refer to Table of Contents in Project Specifications Manual.”

3. Subparagraph 8.1.7 Addenda: Add the following: “To be determined during bidding.”

ARTICLE 10: SUPPLEMENTARY INSTRUCTIONS

1. Paragraph 10.1 Reference
   A. "10.1 Reference; add the following
      1. All references to provisions in Article 10 - Supplementary Instructions to Bidders are hereby transferred to Section 00 21 13 - Supplementary Instructions to Bidders. Any modifications stated in Section 00 21 13 shall have the same force and effect as if stated in Article 10."

END OF SECTION

SECTION 00 31 00
AVAILABLE PROJECT INFORMATION

A. Subsurface investigation report prepared by Terracon attached for reference.
B. Construction Manager has signed an IMPACT Memorandum of Understanding with Illowa Construction and Management Council.
C. Comply with State of Illinois Prevailing Wage Act (820 ILSC 130) and Prevailing Wages for Rock Island County as published on the State of Illinois Department of Labor website.
D. Reference Preliminary Project Schedule
E. Post Bid Interview Package – Not to be submitted with Bid, instead to be submitted with apparent low bidders for each Bid Package contract. Also reference Close Out Requirements as part of this form.

END OF SECTION

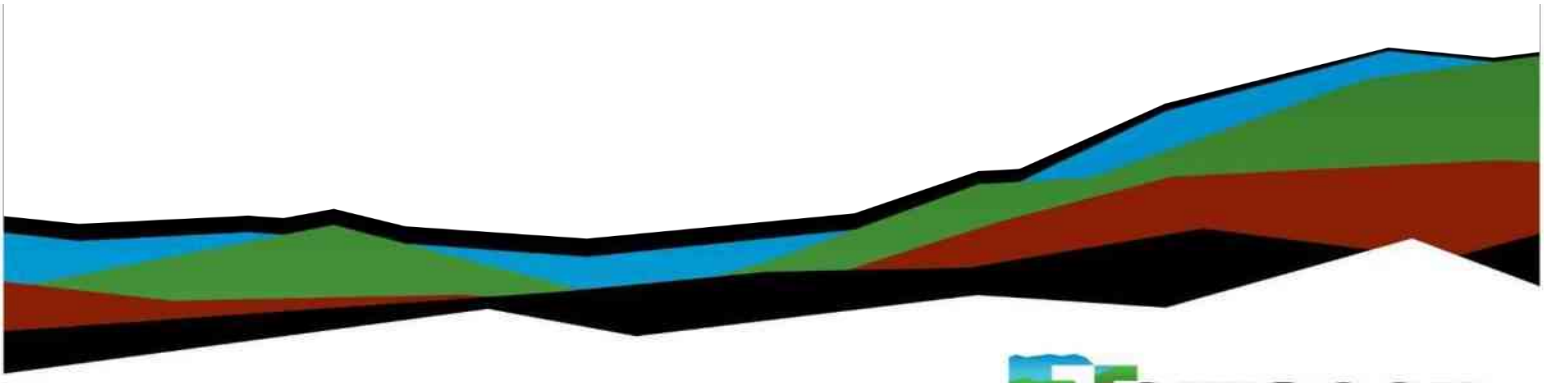
Lincoln-Irving Elementary School Addition

Preliminary Geotechnical Engineering Report

February 20, 2024 | Terracon Project No. 07235203

Prepared for:

Moline-Coal Valley Illinois School District
1619 11th Avenue
Moline, Illinois 61265



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February 20, 2024

Moline-Coal Valley Illinois School District
1619 11th Avenue
Moline, Illinois 61265

Attn: Mr. Keith Karstens, Director of Facilities
C/O: Mr. Jesse Smith, Russell Construction

Re: Preliminary Geotechnical Engineering Report
Lincoln-Irving Elementary School Addition
1015 16th Avenue
Moline, Illinois
Terracon Project No. 07235203

Dear Mr. Karstens:

We have completed the scope of geotechnical engineering services for the above referenced project in general accordance with Terracon Proposal No. P07235203 dated January 4, 2024. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations, floor slabs, and pavements for the proposed project.

We appreciate the opportunity to be of service to you on this project and look forward to providing the recommended testing and observation services during construction. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,

Terracon
(Illinois Firm Registration No. 184.004050-006)



Minwoo Cho, P.E.
Project Engineer
Illinois No. 062.075623
Expires: 11/30/2025

Sara J. Somsky, P.E.
Principal
Illinois No. 062.068595
Expires: 11/30/2025

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Note: This report was originally delivered in a web-based format. **Blue Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the Terracon logo will bring you back to this page. For more interactive features, please view your project online at **client.terracon.com**.

Refer to each individual Attachment for a listing of contents.

Introduction

This report presents the results of our subsurface exploration and preliminary geotechnical engineering services performed for the proposed addition to the existing Lincoln-Irving Elementary School located at 1015 16th Avenue in Moline, Illinois. The purpose of these services was to provide information and preliminary geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Site preparation and earthwork
- Foundation design and construction
- Floor slab design and construction
- Pavement design and construction
- Frost considerations

The geotechnical engineering Scope of Services for this project included the advancement of borings, laboratory testing, engineering analysis, and preparation of this report.

Drawings showing the site and boring locations are shown on the **Site Location** and **Exploration Plan**, respectively. The results of the laboratory testing performed on soil samples obtained from the site during our field exploration are included on the boring logs in the **Exploration and Laboratory Results** section.

Project Description

Our current understanding of the project conditions is as follows:

Item	Description
Information Provided	Request for proposal from Mr. Smith with via Building Connected dated December 22, 2023 included a PDF *Request For Proposal (RFP) – Design Consultant Services.*
Project Description	The project is currently in the conceptual phase and a site plan is not available. We understand a single- or two-story building addition along 10th Street and a single-story gymnasium and cafeteria addition within the southern portion of the existing parking lot are proposed at the existing Lincoln-Irving Elementary School. A new parking lot for the school is proposed north of the existing school, within six residential lots that have been razed.

Item	Description
Building Construction	Information regarding the proposed construction was not provided. Our report considered the proposed construction will consist of: ▪ Steel framing ▪ Load-bearing masonry walls ▪ Grade-supported floor slabs
Finished Floor Elevation	Not provided; the recommendations herein consider the addition's FFE will match the ground level FFE of the existing building.
Maximum Loads	Anticipated structural loads were not provided. In the absence of information provided by the design team, we considered the following loads in our preliminary settlement estimates based on our experience with similar projects. ▪ Columns: 100 kips ▪ Walls: 4 kips per linear foot (klf) ▪ Slabs: 100 pounds per square foot (psf)
Grading	Not provided; we considered up to 2 feet of cut/fill will be required to establish subgrade elevation excluding remedial cut/fill efforts.
Pavements	We understand that Moline-Coal Valley Illinois School District (MCVSD) prefers 4" thick asphaltic concrete underlain by 8" of aggregate subbase. Anticipated traffic volume has not been provided to Terracon. We considered that the traffic classification will consist of: ▪ Class I: Parking stalls for autos and pickup trucks: up to 200 vehicles per day ▪ Class II: Traffic consisting of home delivery trucks, trash pickup: up to 4 vehicles per week The pavement design period is 20 years.

Terracon should be notified if any of the above information is inconsistent with the planned construction, especially the grading limits and structural loading information, as modifications to our recommendations may be necessary.

Site Conditions

The following description of site conditions is derived from our site visit in association with the field exploration.

Item	Description
Parcel Information	The project is located at the existing Lincoln-Irving Elementary School at 1015 16th Avenue in Moline, Illinois. Latitude/Longitude: 41.4975°, -90.5231° (approximate) See **Site Location**
Existing Improvements	Lincoln-Irving Elementary School and associated driveway and parking lot. We understand former structures were previously demolished across the site. Furthermore, residential houses at the northern portion of the site has been previously demolished.
Current Ground Cover	Asphalt paved or light vegetation
Existing Topography	Based on Illinois Department of Natural Resources (IDNR) Elevation Finder Tool, the elevation at boring location varies from 693 to 695 feet mean sea level (MSL).

Geotechnical Characterization

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of the site. Conditions observed at each exploration point are indicated on the individual logs. The individual logs can be found in the **Exploration and Laboratory Results** and the GeoModel can be found in the **Figures** attachment of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	General Description
1	**Surface Material**	Topsoil / Asphalt and aggregate base course
2	**Existing Fill**	Lean Clay with various amounts of silt; Lean to Fat Clay; Poorly Graded Sand with various amounts of silt, clay, gravel, brick fragments, and organics
3	**Native Clay**	Lean Clay with various amounts of silt, sand, and fine roots; Lean to Fat Clay and Fat Clay
4	**Native Silt**	Silt

The borings were advanced using a rotary drilling technique that allows short term subsurface water observations to be made while drilling. Subsurface water was encountered in two of the ten borings performed. The subsurface water encountered at this site appears to be perched water within the granular material of the lean clay. The depths to subsurface water encountered in the borings during and shortly after drilling are listed in the following table:

Boring ID	Depth to Subsurface Water	
	While Drilling (feet bgs[1])	After Drilling (feet bgs[1,2])
B-1	7½	9
B-2	8	9
B-3	13	16
B-4	7½	9
B-5	12	12
B-6	8	15
P-1	8	8
P-2	8½	8½
P-3	5	NE

1. bgs – below ground surface
2. NE – not encountered

Groundwater conditions may be different at the time of construction. Mapping by the Natural Resources Conservation Service (NRCS) indicates a seasonal high groundwater level deeper than 80 inches below ground surface. Groundwater conditions may change because of seasonal variations in rainfall, runoff, and other conditions not apparent at the time of drilling. Long-term groundwater monitoring was outside the scope of services for this project.

Geotechnical Overview

Exiting fill was encountered to depths of 3 to 6 feet at the boring locations. Existing fill may extend to deeper depth in areas not explored. The existing fill was variable in its composition and layering. There were previous structures across the site, and we are not aware of previous basements and demolition procedures.

Standard penetration resistance values within the existing fill were also highly variable and ranged from 5 to 35 blows per foot. Furthermore, deleterious materials such as brick fragments and organics were observed at multiple boring locations. Structures and pavements supported over undocumented and/or variable, existing fill often do not perform predictably. Although portions of the fill may have been in place for some time, without documentation of testing during placement, there is a risk of unpredictable

performance and larger than normal settlements of foundations, floor slabs, and pavements supported over the undocumented fill.

With the overexcavation and replacement of existing fill and low strength cohesive material, it should be possible to support light building loads using shallow footing foundations. Depending upon the size of the footing and design bearing elevation, footings bearing on suitable native soils or on structural fill extending to approved native soils should be able to support light buildings. Refer to **Shallow Foundation** section.

The near surface existing fill and low to high plasticity clay could become unstable with typical earthwork and construction traffic, especially after precipitation events. The effective drainage should be completed early in the construction sequence and maintained after construction to avoid potential issues. If possible, the grading should be performed during the warmer and drier times of the year. If grading is performed during the winter months, an increased risk for possible undercutting and replacement of unstable subgrade will persist. Additional site preparation recommendations, including subgrade improvement and fill placement, are provided in the **Earthwork** section.

Expansive soils are present on this site. This report provides recommendations to help mitigate the effects of soil shrinkage and expansion. However, even if these procedures are followed, some movement and (at least minor) cracking in the structure should be anticipated. The severity of cracking and other damage such as uneven floor slabs will probably increase if modification of the site results in excessive wetting or drying of the expansive soils. Eliminating the risk of movement and distress may not be feasible, but it may be possible to further reduce the risk of movement if significantly more expensive measures are used during construction. Some of these options are discussed in this report such as complete replacement of expansive soils or a structural slab.

Our opinion of pavement section thickness design has been developed based on our understanding of the intended use, assumed traffic, and subgrade preparation recommended herein using methodology contained in NAPA IS-109 "Design of Hot Mix Asphalt Pavements" and adjusted with consideration to that MCVSD's typical pavement section. The **Pavements** section includes minimum pavement component thickness based on our current understanding of the project.

Differential settlement should be anticipated between the existing structure and the addition. To reduce the differential settlement, support of addition with ground improvement or deep foundation may be considered.

Due to the proximity and age of existing structures adjacent to the proposed construction site, it is our opinion that a pre-construction condition survey should be performed to document the current condition of the existing structures. The structures should also be observed periodically, and during specific phases of construction, such as excavating in close proximity of the existing structures, compaction and deep foundation installation, for any indications of movement or damage. Vibration monitoring could also

be considered, particularly during earthwork and foundation phases of the project, to evaluate if vibration levels are approaching limits that could damage existing structures. Upon request, we are available to discuss and prepare a proposal to provide these services.

The recommendations contained in this report are based upon the results of field and laboratory testing (presented in the **Exploration and Laboratory Results**), engineering analyses, and our current understanding of the proposed project. The **General Comments** section provides an understanding of the report limitations.

Earthwork

Earthwork is anticipated to include demolition, clearing and grubbing, excavations, and structural fill placement. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria, as necessary, to render the site in the state considered in our geotechnical engineering evaluation for foundations, floor slabs, and pavements.

Existing Fill

As noted in **Geotechnical Characterization**, the borings encountered previously placed fill to depths ranging from about 3 to 6 feet. Based on the highly variable resistance values and deleterious material such as brick fragments observed throughout the fill, we do not believe that the existing fill was placed in a controlled manner. Consequently, the existing fill material is not considered suitable for foundation loading. We recommend that foundation to bear on suitable native material below the existing fill. Existing fill should be removed and replaced with structural fill.

Support of floor slabs and pavements on or above existing fill soils is discussed in this report. However, even with the recommended construction procedures, inherent risk exists for the owner that compressible fill or unsuitable material, within or buried by the fill will, not be discovered. This risk of unforeseen conditions cannot be eliminated without completely removing the existing fill but can be reduced by following the recommendations contained in this report.

If the owner elects to construct the floor slabs and pavements on the existing fill to reduce initial construction costs in exchange for an increased potential for poor performance, increased maintenance and some need for repairs, the following protocol should be followed. The existing fill in the area of floor slabs and pavements should be removed to a depth of at least 2 feet below the planned finished floor elevation. The building area should be undercut horizontally, at a minimum of vertical depth of the overexcavation beyond its perimeter to a depth of 5 feet.

Site Preparation/Subgrade Preparation

Prior to placing fill, existing vegetation, topsoil, root mats, and existing pavement should be removed. Complete stripping of the topsoil should be performed in the proposed building and parking/driveway areas.

Mature trees are located within the proposed pavement area, especially on the northern portion of the site, which will require removal at the onset of construction. Tree root systems can remove substantial moisture from surrounding soils. Where trees are removed, the full root ball and all associated dry and desiccated soils should be removed. The soil materials which contain less than 5 percent organics can be reused as engineered fill provided the material is moisture conditioned and properly compacted.

Following demolition, clearing and grubbing, and prior to placing new structural fill, the exposed subgrade should be observed and tested by Terracon personnel. A Terracon representative should perform probes and in-place density testing and observe proof-rolling of the subgrade in floor slab and pavement areas. Proof-rolling can be accomplished using a large 4-foot vibratory drum roller with a gross weight of at least 10 tons, or a loaded tandem-axle dump truck with a gross weight of at least 20 tons where crushed stone or clay soil is present. Proof-rolling would help to provide a stable base for the compaction of new structural fill, and delineate low density, soft, unstable, or disturbed areas that may exist within 1 to 2 feet of the subgrade level.

In the area of Borings B-4 and P-2, the subgrade soils are comprised of moderate plasticity clay material exhibiting the potential to shrink and swell with fluctuations in water content. Furthermore, if more than 1½ feet of cut is planned in the area of Borings B-2, B-3, B-6, and P-3, moderate to high plasticity clay material will likely be encountered within 1½ feet of subgrade elevation. Construction of the proposed structures and associated pavements and revising site drainage may create the potential for gradual increased water contents within the clays. Increases in water content will cause the clays to swell and cause cracking or differential settlement of overlying structures. Therefore, we recommend expansive soils be removed to a depth of at least 1½ foot below the proposed subgrade elevation for floor slabs and pavements.

Once unsuitable materials have been remediated, and the subgrade has passed the proof-roll test, backfill to finished subgrade elevation can begin. Backfill material should consist of LVC material such as low plasticity cohesive soils or granular soils, as outlined in **Fill Material Types**. Aggregate base course can be considered part of the 18-inch thick LVC zone if the material is well-graded crushed stone aggregate such as material conforming to the requirements of Illinois Department of Transportation (IDOT) Coarse aggregate CA-6 or CA-7. Existing undocumented fill that was removed could be evaluated for reuse as structural fill.

Fill Material Types

Fill placed in building and pavement areas should be low plasticity cohesive soil or granular soil. Fill placed in relatively small or confined excavations should consist of well-graded granular material. This should provide for greater ease of placement and compaction in areas where larger compaction equipment cannot be operated. The use of granular fill in these isolated and potentially deeper excavations would reduce the potential for differential settlement for building and pavement components.

The surficial low plasticity sandy lean clay and sand materials encountered in the borings are considered suitable for use as structural fill. Sorting will be required where brick fragments and organics are encountered. Care should be taken during site preparation to avoid inter-layering of granular and fine-grained materials to limit the potential for water to become trapped within the subgrade. This is particularly important within the frost depth below exterior, grade-supported elements. Moisture conditioning (e.g., drying of clays and wetting of sands) should be anticipated if on-site soils are used as fill. Structural fill should preferably not contain deleterious materials, such as brick fragments and organic materials observed in Borings B-5 and B-6.

For the purposes of this report, structural fill is defined as:

- Fill placed below the building foundations
- Foundation excavation backfill within 5 feet of the perimeter of the building
- Fill below building floor slabs and pavements.

Structural fill should meet the following material property requirements for this project.

Fill Type [1, 2]	USCS Classification	Acceptable Areas for Placement
Low plasticity cohesive [3]	CL, CL/SC (LL ≤ 45 and PI ≤ 23)	General site grading fill
High plasticity cohesive[3]	CL/CH, CH	General site grading fill, at least 2 feet below final grade
Chemically modified moderate to high plasticity cohesive[3,4]	CL/CH, CH	General site grading fill
Granular [5,6]	GW, GP, GM, GC, SW, SP, SM, SC	General site grading fill for the building and pavements
Unsuitable	CL/CH, CH, ML, MH, OL, OH, PT	Green (non-structural) locations

1. Structural fill should consist of approved materials that are free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen

subgrade. A sample of each material type should be submitted to the geotechnical engineer for evaluation prior to use on this site.

2. Any organic materials, rock fragments larger than 3 inches, and other unsuitable materials should be removed prior to use as structural fill.
3. Highly susceptible to frost; unstable when wet, are commonly used for pavement support with the knowledge that additional maintenance and/or shorter pavement life are likely.
4. Moderate to high plasticity soils may only be used as structural fill if modified by chemical modification (such as lime or cement). LL ≤ 45 and PI ≤ 20 should be achieved with the modification prior to use as structural fill.
5. Specific material requirements will need to be satisfied based on intended use and should be approved by the geotechnical engineer.
6. Should have at least 12% passing the U.S. No. 200 sieve when placed above moderate to high plasticity clay soils.

Appropriate laboratory tests, including Atterberg Limits for cohesive soils, organic content tests for dark colored soils and/or those that exhibit a noticeable odor, and standard Proctor (ASTM D698) moisture-density relationship tests should be performed on proposed fill materials prior to their use as structural fill. Further evaluation of any on-site soils or off-site fill materials should be performed by Terracon prior to delivery and placement on-site.

Fill Placement and Compaction Requirements

Structural fill should be placed and compacted in accordance with the following requirements.

Item	Description
Maximum Lift Thickness	9 inches or less in loose thickness when heavy, self-propelled compaction equipment is used. 4 inches in loose thickness when hand-guided equipment (i.e., jumping jack or plate compactor) is used.
Minimum Compaction Requirements [1, 2]	■ 98 percent • Granular material • Below foundations • Within 1 foot of finished pavement subgrade ■ 95 percent • Below floor slabs • Deeper than 1 foot below finished pavement subgrade

Item	Description
Moisture Content Range from Optimum [1]	Low plasticity cohesive: -2% to +3% High plasticity cohesive: 0 to +4% of optimum Granular: typically, at -3% to +3%; sufficient to achieve compaction without pumping when proof-rolled

1. As determined by the Standard Proctor test (ASTM D698).
2. If the granular material is a coarse sand or gravel, or of a uniform size, or has a low fines content, compaction comparison to relative density may be more appropriate. In this case, granular materials should be compacted to at least 70% relative density (ASTM D 4253 and D 4254).

Utility Trench Backfill

Care should be taken so that the subgrade at the base of the utility excavations is not disturbed during construction. Disturbed or unstable materials should be removed before placing any granular bedding material. Trench backfill should be mechanically placed and compacted as discussed earlier in this report. Compaction of initial lifts should be accomplished with hand-operated tampers or other lightweight compactors. Where trenches are placed beneath slabs or footings, the backfill should satisfy the requirements for structural fill discussed in this report.

For low permeability subgrades, utility trenches are a common source of water infiltration and migration. Utility trenches penetrating beneath the building should be effectively sealed to restrict water intrusion and flow through the trenches, which could migrate below the building. The trench should provide an effective trench plug that extends at least 5 feet from the face of the building exterior. The plug material should consist of cementitious flowable fill or low permeability clay. The trench plug material should be placed to surround the utility line. If used, the clay trench plug material should be placed and compacted to comply with the water content and compaction recommendations for structural fill stated previously in this report.

Grading and Drainage

All grades must provide effective drainage away from the building during and after construction and should be maintained throughout the life of the structure. Water retained next to the building can result in soil movements greater than those discussed in this report. Greater movements can result in unacceptable differential floor slab and/or foundation movements, cracked slabs and walls, and roof leaks. The roof should have gutters/drains with downspouts that discharge at least 5 feet from the building.

Exposed ground should be sloped and maintained at a minimum 5 percent away from the building for at least 10 feet beyond the perimeter of the building. Locally, flatter

grades may be necessary to transition ADA access requirements for flatwork. After building construction and landscaping have been completed, final grades should be verified to document effective drainage has been achieved. Grades around the structure should also be periodically inspected and adjusted, as necessary, as part of the structure's maintenance program. Where paving or flatwork abuts the structure, a maintenance program should be established to effectively seal and maintain joints and limit the amount of surface water infiltration.

Earthwork Construction Considerations

Effective drainage should be completed early in the construction sequence and maintained after construction to avoid potential issues. Upon completion of filling and grading and prior to construction of grade-supported improvements such as floor slabs and pavements, care should be taken to maintain the subgrade water content. The near surface existing fill could become unstable with typical earthwork and construction traffic, especially after precipitation events. Construction traffic over the completed subgrades should be avoided to the extent practical.

The site should be graded to prevent ponding of water on prepared subgrades or in excavations. Water collecting over or adjacent to construction areas should be removed. If the subgrade freezes, desiccates, saturates, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and recompacted prior to floor slab construction. Grading would preferably be performed during the warmer and drier times of the year. If grading is performed during the winter months, an increased risk for possible undercutting and replacement of unstable subgrade will persist.

If groundwater seepage is encountered in the excavations (e.g., during the removal of existing fill and/or grading, foundation construction, and/or utility installation) at this site, the contractor will be responsible for employing appropriate dewatering methods to control seepage and facilitate construction. A temporary dewatering system consisting of sumps with pumps may be necessary to achieve the recommended depth of overexcavation depending on groundwater conditions at the time of construction. Groundwater levels should be maintained at least 2 feet below the deepest excavation level to maintain the stability of excavation base.

As a minimum, excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, "Excavations" and its appendices, and in accordance with any applicable local and/or state regulations. Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety or the contractor's activities; such responsibility shall neither be implied nor inferred. Construction site safety is the sole responsibility of the contractor who controls the

means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety or the contractor's activities; such responsibility shall neither be implied nor inferred.

Construction Observation and Testing

Earthwork should be observed and tested by Terracon, including the removal of existing fill, fill placement, compaction, and subgrade preparation. In areas of foundation excavations, the bearing subgrade should be evaluated by the Geotechnical Engineer. If unanticipated conditions are observed, the Geotechnical Engineer should provide mitigation options. In addition to the documentation of the essential parameters necessary for construction, the continuation of Terracon into the construction phase of the project provides the continuity to maintain our evaluation of geotechnical conditions, including assessing variations and associated design changes.

Shallow Foundations

Design of the building is in the early stages of development. Without the exact location, layout and anticipated loading, the project is currently in early stages to provide final geotechnical recommendation. Selecting the most appropriate foundation type will depend upon the final loads and settlement sensitivity of the structure. We are available to provide specific foundation recommendations once specific project designs are further developed.

Preliminary recommendations are provided for shallow foundations. With overexcavation and replacement of existing fill and low strength cohesive material, it should be possible to support light building loads using shallow footing foundations. Overexcavation of relatively soft cohesive material and dewatering should be anticipated in the area of Boring B-6. Depending upon the size of the footing and design bearing elevation, footings bearing on suitable native soils or on structural fill extending to approved native soils could likely be designed using a maximum net allowable soil bearing pressure in the range of 1,000 to 2,000 psf. The net pressure is the pressure in excess of the minimum surrounding overburden pressure at the design footing base elevation. Provided the foundations bear on/above structural fill or suitable native soils (e.g., medium stiff clays), settlement on the order of about 1 inch is anticipated for the structural loads as outlined in **Project Description.**

As noted in **Earthwork**, the footing excavations should be evaluated under the observation of the Geotechnical Engineer. The base of all foundation excavations should be free of water and loose soil, prior to placing concrete. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Care should be taken to prevent

wetting or drying of the bearing materials during construction. Excessively wet or dry material or any loose/disturbed material in the bottom of the footing excavations should be removed/reconditioned before foundation concrete is placed.

Sensitive soils exposed at the surface of footing excavations may require surficial compaction with hand-held dynamic compaction equipment prior to placing structural fill, steel, and/or concrete. Should surficial compaction not be adequate, construction of a working surface consisting of either crushed stone or a lean concrete mud mat may be required prior to the placement of reinforcing steel and construction of foundations.

Floor Slabs

Settlement of floor slabs supported on existing fill materials cannot be accurately predicted but could be larger than normal and result in some cracking. Mitigation measures, as noted in **Existing Fill** within **Earthwork**, are critical to the performance of floor slabs. In addition to the mitigation measures, the floor slab can be stiffened by adding steel reinforcement, grade beams, and/or post-tensioned elements.

The subgrade soils may be comprised of moderate to high plasticity clay (both fill and native) exhibiting the potential to swell with increased water content. Construction of the floor slab, combined with the revising site drainage creates the potential for gradual increased water contents within the clays. Increases in water content will cause the clays to swell and damage the floor slab. To reduce the swell potential, at least the upper 18 inches of subgrade soils below the floor slab (excluding the floor slab support course) should be an approved Low Volume Change (LVC) material consisting of lean clays or clayey sand.

Finished subgrade, within and for at least 10 feet beyond the floor slab, should be protected from traffic, rutting, or other disturbance and maintained in a relatively moist condition until floor slabs are constructed. If the subgrade should become damaged or desiccated prior to construction of floor slabs, the affected material should be removed, and structural fill should be added to replace the resulting excavation. Final conditioning of the finished subgrade should be performed immediately prior to placement of the floor slab support course.

The use of a vapor retarder should be considered beneath concrete slabs on grade covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, when the project includes humidity-controlled areas, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder.

Saw-cut contraction joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations, refer to the ACI Design Manual. Joints or cracks should be sealed with a waterproof, non-extruding compressible compound specifically recommended for heavy duty concrete pavement.

Where floor slabs are tied to perimeter walls or turn-down slabs to meet structural or other construction objectives, our experience indicates differential movement between the walls and slabs will likely be observed in adjacent slab expansion joints or floor slab cracks beyond the length of the structural dowels. The Structural Engineer should account for potential differential settlement through use of sufficient control joints, appropriate reinforcing or other means.

The Geotechnical Engineer should observe the condition of the floor slab subgrades immediately prior to placement of the floor slab support course, reinforcing steel, and concrete. Attention should be paid to high traffic areas that were rutted and disturbed earlier, and to areas where backfilled trenches are located.

Pavement Considerations

Pavement Subgrade Preparation

Grading and paving are commonly performed by separate contractors and there is often a time lapse between the end of grading operations and the commencement of paving. Subgrades prepared early in the construction process may become disturbed by construction traffic. Non-uniform subgrades often result in poor pavement performance and local failures relatively soon after pavements are constructed. Depending on the paving equipment used by the contractor, measures may be required to improve subgrade strength to greater depths for support of heavily loaded concrete/asphalt trucks.

Support characteristics of subgrade for pavement design do not account for shrink/swell movements of an expansive clay subgrade, such as soils observed on this project. Thus, the pavement may be adequate from a structural standpoint, yet still experience cracking and deformation due to shrink/swell related movement of the subgrade.

We recommend the moisture content and density of the subgrade be evaluated and the pavement subgrades be densified, as discussed in **Earthwork** within two days prior to commencement of actual paving operations. Areas not in compliance with the required ranges of moisture or density should be scarified, moisture conditioned, and compacted. Particular attention should be paid to high traffic areas that were rutted and disturbed earlier and to areas where backfilled trenches are located. Areas where unsuitable conditions are located should be repaired by removing and replacing the materials with

properly compacted fills. The subgrade should be in its finished form at the time of the final review.

Preliminary Pavement Design Parameters and Thicknesses

Pavement designs are provided for the traffic conditions and pavement life conditions as noted in **Project Description** and in the following sections of this report. A critical aspect of pavement performance is site preparation. Pavement designs noted in this section must be applied to the site which has been prepared as recommended in the **Earthwork** section. A California Bearing Ratio (CBR) of 3 was used for the subgrade for the asphaltic concrete (AC) pavement designs. The value was empirically derived based upon our experience with the lean clay, lean to fat clay, and fat clay subgrade soils and our expectation of the quality of the subgrade as prescribed by the **Site Preparation** conditions as outlined in **Earthwork**. Moline-Coal Valley Illinois School district provided the typical asphaltic concrete section comprised of 4 inches of asphalt underlain by 8 inches of aggregate base course, which appears to beacceptable for the anticipated traffic.

However, areas for parking of heavy vehicles, concentrated turn areas, and start/stop maneuvers could require thicker pavement sections. Edge restraints (i.e. concrete curbs or aggregate shoulders) should be planned along curves and areas of maneuvering vehicles.

Openings in pavements, such as decorative landscaped areas, are sources for water infiltration into surrounding pavement systems. Water can collect in the islands and migrate into the surrounding subgrade soils thereby degrading support of the pavement. Islands with raised concrete curbs, irrigated foliage, and low permeability near-surface soils are particular areas of concern. The civil design for the pavements with these conditions should include features to restrict or collect and discharge excess water from the islands. Examples of features are edge drains connected to the stormwater collection system, longitudinal subdrains, or other suitable outlets and impermeable barriers preventing lateral migration of water such as a cutoff wall installed to a depth below the pavement structure.

Pavement Maintenance

The pavement sections represent minimum recommended thicknesses and, as such, periodic upkeep should be anticipated. Preventive maintenance should be planned and provided for through an on-going pavement management program. Maintenance activities are intended to slow the rate of pavement deterioration and to preserve the pavement investment. Pavement care consists of both localized (e.g., crack and joint sealing and patching) and global maintenance (e.g., surface sealing). Additional engineering consultation is recommended to determine the type and extent of a cost-

effective program. Even with periodic maintenance, some movements and related cracking may still occur, and repairs may be required.

Pavement performance is affected by its surroundings. In addition to providing preventive maintenance, the civil engineer should consider the following recommendations in the design and layout of pavements:

- Final grade adjacent to paved areas should slope down from the edges at a minimum 2%.
- Subgrade and pavement surfaces should have a minimum 2% slope to promote proper surface drainage.
- Install pavement drainage systems surrounding areas anticipated for frequent wetting.
- Install joint sealant and seal cracks immediately.
- Seal all landscaped areas in or adjacent to pavements to reduce moisture migration to subgrade soils.
- Place compacted, low permeability backfill against the exterior side of curb and gutter.
- Place curb, gutter and/or sidewalk directly on clay subgrade soils rather than on unbound granular base course materials.

Frost Considerations

The soils on this site are frost susceptible, and small amounts of water can affect the performance of the slabs on-grade, sidewalks, and pavements. Exterior slabs should be anticipated to heave during winter months. If frost action needs to be eliminated in critical areas, we recommend the use of non-frost susceptible (NFS) fill or structural slabs (for instance, structural stoops in front of building doors). Placement of NFS material in large areas may not be feasible; however, the following recommendations are provided to help reduce potential frost heave:

- Provide surface drainage away from the building and slabs, and toward the site drainage system.
- Install drains around the perimeter of the building, stoops, below exterior slabs and pavements, and connect them to the site drainage system.
- Grade clayey subgrades so groundwater potentially perched in overlying fill or aggregate base, slope toward a site drainage system.
- Place NFS fill as backfill beneath slabs and pavements critical to the project.
- Place a 3 horizontal to 1 vertical (3H:1V) transition zone between NFS fill and other soils.
- Place NFS materials in critical sidewalk areas.

As an alternative to extending NFS fill to the full frost depth, consideration can be made to placing extruded polystyrene or cellular concrete under a buffer of at least 2 feet of NFS material.

General Comments

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Support of floor slabs and pavements above existing undocumented fill is discussed in this report. Even with the construction observation/testing recommended in this report, a risk remains for the owner that unsuitable materials within or buried by the fill will not be discovered. This may result in a larger than normal settlement of the floor slab and pavement supported above existing fill. This risk cannot be eliminated without removing and replacing the existing fill with structural fill from below the addition's area. Terracon does not accept any risk if the owner chooses to support the slab over the existing fill.

The recommendations presented in this report regarding high plasticity clay soils are based on our knowledge of the site soil conditions, our experience with similar sites and structures. The recommendations provided in this report will not eliminate the risk of movement and cosmetic distress for slab-on-ground construction, but this risk could be further reduced if significantly more expensive measures are used during construction.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not

intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly affect excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety and cost estimating including excavation support and dewatering requirements/design are the responsibility of others. Construction and site development have the potential to affect adjacent properties. Such impacts can include damages due to vibration, modification of groundwater/surface water flow during construction, foundation movement due to undermining or subsidence from excavation, as well as noise or air quality concerns. Evaluation of these items on nearby properties are commonly associated with contractor means and methods and are not addressed in this report. The owner and contractor should consider a preconstruction/precondition survey of surrounding development. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

Figures

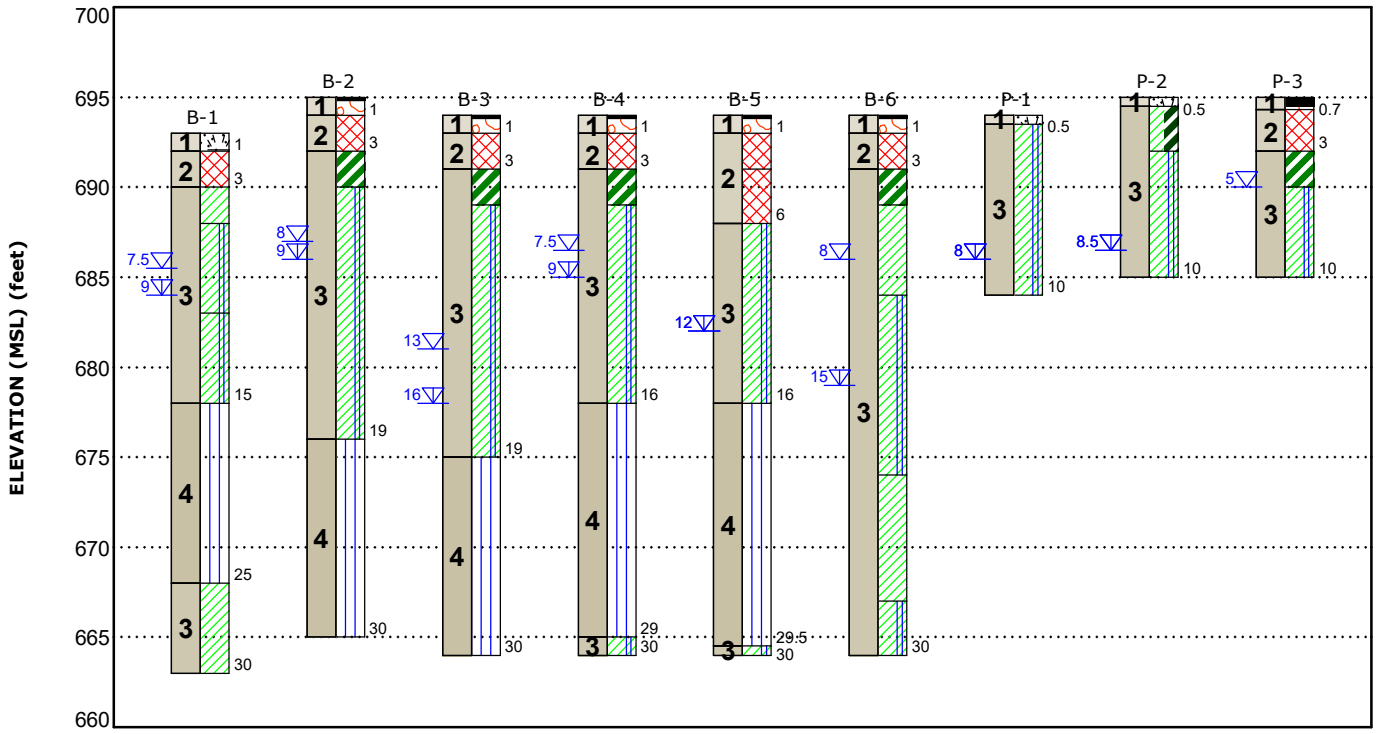
Contents:

GeoModel

Lincoln Irving Elementry School Addition
1015 16th Ave | Moline, Illinois
Terracon Project No. 07235203

Terracon
870 40th Ave
Bettendorf, IA

GeoModel



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	Surface	Topsoil Asphalt and Aggregate Base Course
2	Existing Fill	Lean Clay with various amounts of silt; Lean to Fat Clay; Poorly Graded Sand with various amounts of silt, clay, gravel, brick fragments, and organics
3	Native Clay	Lean Clay with various amounts of silt, sand, and fine roots; Lean to Fat Clay; Fat Clay
4	Native Silt	Silt

Legend

- Topsoil
- Fill
- Lean Clay
- Lean Clay with Silt
- Silt
- Asphalt
- Aggregate Base Course
- Fat Clay
- Lean Clay/Fat Clay

▽ First Water Observation
▽ Second Water Observation

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time.
Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project.
Numbers adjacent to soil column indicate depth below ground surface.

Attachments

Exploration and Testing Procedures

Field Exploration

MCVSD requested the following field exploration program:

Boring ID	Approximate Boring Depth (feet)	Location
B-1 to B-6	30	Potential building addition areas
P-1 to P-3	10	Proposed parking/driveway area

Boring Layout and Elevations: Terracon personnel provided the boring layout using handheld GPS equipment (estimated horizontal accuracy of about ±10 feet) and referencing existing site features. Approximate ground surface elevations were obtained by interpolation from the Illinois department of natural resources (IDNR) Elevation Finder Tool.

Subsurface Exploration Procedures: We advanced the borings with an ATV-mounted rotary drill rig using continuous-flight solid-stem augers (Borings B-1 through B-3, B-5, B-3, and P-1 through P-3) and continuous-flight hollow-stem augers (Boring B-4). Sampling was performed using thin-walled tube and split-barrel sampling procedures. In the thin-walled tube sampling procedure, a thin-walled, seamless steel tube with a sharp cutting edge was pushed hydraulically into the soil to obtain a relatively undisturbed sample. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the bottom of the borehole by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths.

For safety purposes, all borings were backfilled with auger cuttings after their completion. Downhole plug was installed near surface at the borings located in grass areas. Pavements were patched with cold-mix asphalt.

We also observed the boreholes while drilling and at the completion of drilling for the presence of groundwater. The groundwater levels are shown on the attached boring logs.

The sampling depths, penetration distances, and other sampling information were recorded on the field logs. The samples were placed in appropriate containers and taken to our laboratory for testing and classification by an engineer. Our exploration team prepared field logs as part of the drilling operations. These field logs included visual classifications of the materials observed during drilling and our interpretation of the subsurface conditions between samples. Boring logs included in this report were

prepared from the field logs, represent the project engineer's interpretation of the field logs, and include modifications based on observations and tests of the samples in our laboratory.

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests. The laboratory testing program included the following types of tests:

- Moisture Content
- Dry Unit Weight (on thin-wall cohesive soils only)
- Unconfined Compression (on thin-wall cohesive soils only)
- Atterberg Limits

The laboratory testing program included examination of soil samples by an engineer. Based on the results of our field and laboratory programs, we described and classified the soil samples in accordance with the Unified Soil Classification System.

Site Location and Exploration Plan

Contents:

Site Location
Exploration Plan

Note: All attachments are one page unless noted above.

Site Location

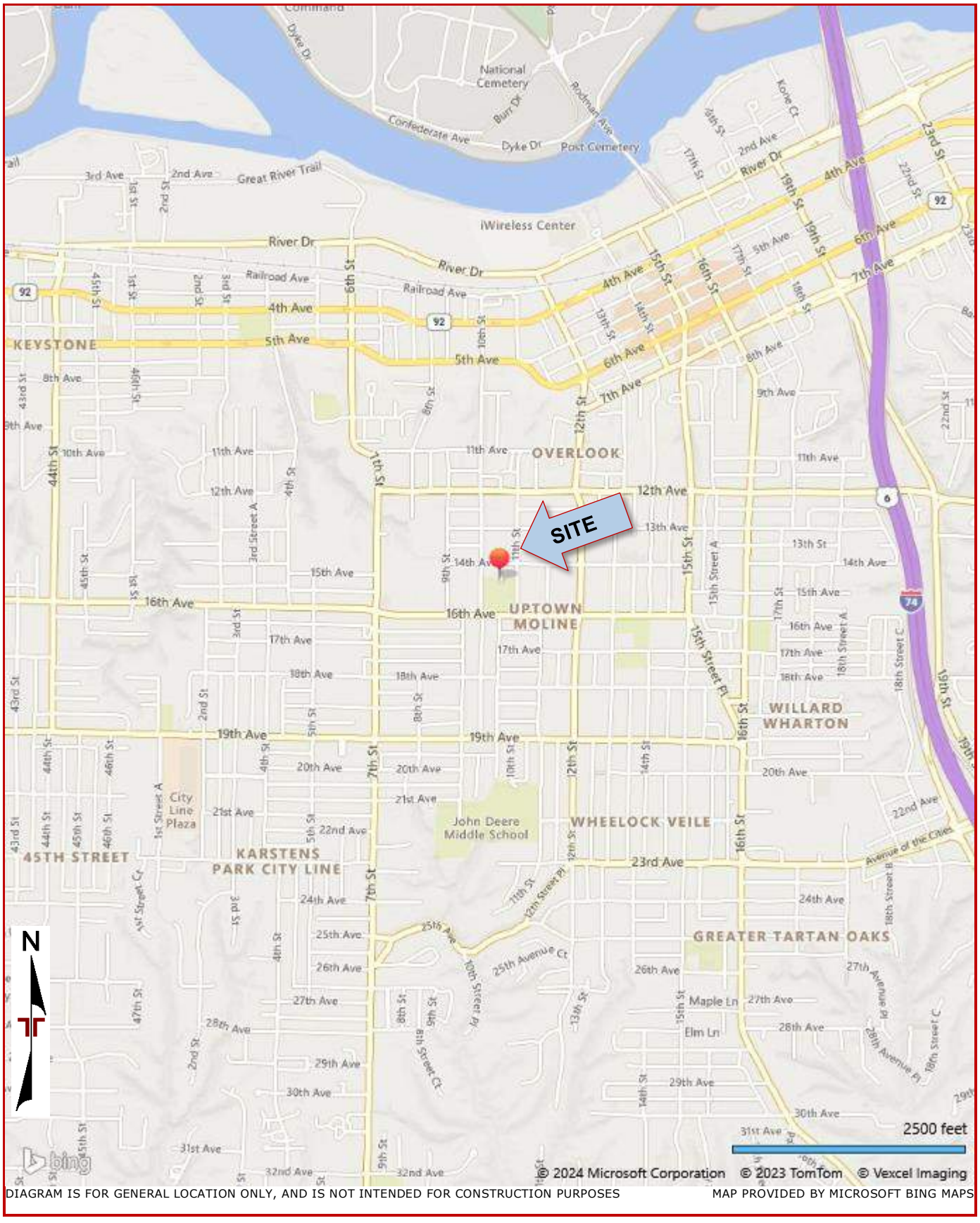


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration Plan



DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

Exploration and Laboratory Results

Contents:

Boring Logs (B-1 through B-6 and P-1 through P-3)

Note: All attachments are one page unless noted above.

Lincoln Irving Elementry School Addition
1015 16th Ave | Moline, Illinois
Terracon Project No. 07235203

Terracon
870 40th Ave
Bettendorf, IA

Boring Log No. B-1

Location: See Exploration Plan

Latitude: 41.4976° Longitude: -90.5235°

Model Layer	Graphic Log	Depth (Ft.)	Elevation: 693 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Sample Number	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI
1		1.0	**TOPSOIL**, approx. 12" 692										
2		3.0	**FILL - LEAN CLAY**, brown and gray 690				16	2-3-4 N=7	1		29.0		
3		5.0	**LEAN CLAY (CL)**, trace fine roots, gray and brown 688				10		2	1560	29.0	94	
		10.0	**LEAN CLAY WITH SILT (CL)**, brown and gray, medium stiff 683	5			13	2-2-3 N=5	3		25.7		
							24		4	1140	26.3	102	
		15.0	**LEAN CLAY WITH SILT (CL)**, brownish gray, soft 678	10			18	1-1-1 N=2	5		26.9		
4		25.0	**SILT (ML)**, gray, medium stiff 668	15			18	1-3-3 N=6	6		26.3		
				20			17	2-3-3 N=6	7		27.5		
				25									

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from Illinois Department of Natural Resources (IDNR) Elevation Finder Tool.

Water Level Observations
7½' while drilling
9' after drilling

Drill Rig
748

Hammer Type
Automatic

Driller
RP

Logged by
LW

Boring Started
02-01-2024

Boring Completed
02-01-2024

Notes

Advancement Method
Continuous-Flight Solid-Stem Auger

Abandonment Method
Boring backfilled with auger cuttings and bentonite chips upon completion. Down hole plug installed near surface after drilling.

Lincoln Irving Elementry School Addition
1015 16th Ave | Moline, Illinois
Terracon Project No. 07235203

Terracon
870 40th Ave
Bettendorf, IA

Boring Log No. B-1

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 41.4976° Longitude: -90.5235° Depth (Ft.) Elevation: 693 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Sample Number	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI
3		**LEAN CLAY (CL)**, gray, medium stiff										
					X	18	3-3-3 N=6	8		26.1		
		30.0 663	30									
		Boring Terminated at 30 Feet										

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from Illinois Department of Natural Resources (IDNR) Elevation Finder Tool.

Water Level Observations
▽ 7½' while drilling
▽ 9' after drilling

Drill Rig
748

Hammer Type
Automatic

Driller
RP

Logged by
LW

Boring Started
02-01-2024

Boring Completed
02-01-2024

Notes

Advancement Method
Continuous-Flight Solid-Stem Auger

Abandonment Method
Boring backfilled with auger cuttings and bentonite chips upon completion. Down hole plug installed near surface after drilling.

Lincoln Irving Elementry School Addition
1015 16th Ave | Moline, Illinois
Terracon Project No. 07235203

Terracon
870 40th Ave
Bettendorf, IA

Boring Log No. B-2

Location: See Exploration Plan

Latitude: 41.4976° Longitude: -90.5231°

Model Layer	Graphic Log	Depth (Ft.)	Elevation: 695 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Sample Number	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI
1		0.2	**ASPHALT**, approx. 2" 694.8										
		1.0	**AGGREGATE BASE COURSE**, approx. 10" 694										
2		3.0	**FILL - LEAN CLAY WITH SILT**, dark gray and brown 692				4	3-3-4 N=7	1		20.9		
3		5.0	**FAT CLAY (CH)**, brown and gray, stiff 690				13		2	3960	25.2	98	55-20-35
			LEAN CLAY WITH SILT (CL), brown and gray, soft to medium stiff	5			14	2-2-2 N=4	3		26.8		
					▽								
					▽		24		4	1310	27.3	101	
				10									
							18	2-1-2 N=3	5		27.5		
				15									
		19.0	676										
4			**SILT (ML)**, dark gray, medium stiff				16	3-3-3 N=6	6		23.6 29.3		
				20									
							18	3-3-4 N=7	7		25.0		
				25									

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from Illinois Department of Natural Resources (IDNR) Elevation Finder Tool.

Water Level Observations
▽ 8' while drilling
▽ 9' after drilling

Drill Rig
748

Hammer Type
Automatic

Driller
RP

Logged by
LW

Boring Started
02-01-2024

Boring Completed
02-01-2024

Notes

Advancement Method
Continuous-Flight Solid-Stem Auger

Abandonment Method
Boring backfilled with auger cuttings and bentonite chips upon completion. Surface capped with Asphalt patch after drilling.

Lincoln Irving Elementry School Addition
1015 16th Ave | Moline, Illinois
Terracon Project No. 07235203

Terracon
870 40th Ave
Bettendorf, IA

Boring Log No. B-2

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 41.4976° Longitude: -90.5231° Depth (Ft.) Elevation: 695 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Sample Number	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI
4		**SILT (ML)**, dark gray, medium stiff *(continued)*										
					X	18	2-2-2 N=4	8		25.0		
		30.0 665	30									
		Boring Terminated at 30 Feet										

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from Illinois Department of Natural Resources (IDNR) Elevation Finder Tool.

Water Level Observations
8' while drilling
9' after drilling

Drill Rig
748

Hammer Type
Automatic

Driller
RP

Logged by
LW

Boring Started
02-01-2024

Boring Completed
02-01-2024

Notes

Advancement Method
Continuous-Flight Solid-Stem Auger

Abandonment Method
Boring backfilled with auger cuttings and bentonite chips upon completion. Surface capped with Asphalt patch after drilling.

Lincoln Irving Elementry School Addition
1015 16th Ave | Moline, Illinois
Terracon Project No. 07235203

Terracon
870 40th Ave
Bettendorf, IA

Boring Log No. B-3

Location: See Exploration Plan

Latitude: 41.4976° Longitude: -90.5227°

Model Layer	Graphic Log	Depth (Ft.)	Elevation: 694 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Sample Number	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI
1		0.2	**ASPHALT**, approx. 2" 693.8										
		1.0	**AGGREGATE BASE COURSE**, approx. 10" 693										
2		3.0	**FILL - LEAN CLAY WITH SILT**, dark gray and brown 691				13	5-3-3 N=6	1		23.1		
3		5.0	**FAT CLAY (CH)**, brown and gray, medium stiff 689	5			24		2	1060	29.1	93	
			LEAN CLAY WITH SILT (CL), brown and gray, soft to medium stiff				17	2-2-2 N=4	3		26.9		
							22		4	1590	27.8	97	
				10	▽								
							16	2-3-4 N=7	5		24.0		
				15	▽								
		19.0	675										
4			**SILT (ML)**, dark gray, medium stiff				18	0-2-3 N=5	6		24.5		
				20									
							18	2-3-5 N=8	7		27.5		
				25									

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from Illinois Department of Natural Resources (IDNR) Elevation Finder Tool.

Water Level Observations
▽ 13' while drilling
▽ 16' after drilling

Drill Rig
748

Hammer Type
Automatic

Driller
RP

Logged by
LW

Boring Started
02-01-2024

Boring Completed
02-01-2024

Notes

Advancement Method
Continuous-Flight Hollow-Stem Auger

Abandonment Method
Boring backfilled with auger cuttings and bentonite chips upon completion. Surface capped with Asphalt patch after drilling.

Lincoln Irving Elementry School Addition
1015 16th Ave | Moline, Illinois
Terracon Project No. 07235203

Terracon
870 40th Ave
Bettendorf, IA

Boring Log No. B-3

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 41.4976° Longitude: -90.5227° Depth (Ft.) Elevation: 694 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Sample Number	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI
4		**SILT (ML)**, dark gray, medium stiff *(continued)*										
		30.0 664			X	18	1-2-4 N=6	8		22.7		
		Boring Terminated at 30 Feet	30									

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from Illinois Department of Natural Resources (IDNR) Elevation Finder Tool.

Water Level Observations
▽ 13' while drilling
▽ 16' after drilling

Drill Rig
748

Hammer Type
Automatic

Driller
RP

Logged by
LW

Boring Started
02-01-2024

Boring Completed
02-01-2024

Notes

Advancement Method
Continuous-Flight Hollow-Stem Auger

Abandonment Method
Boring backfilled with auger cuttings and bentonite chips upon completion. Surface capped with Asphalt patch after drilling.

Lincoln Irving Elementry School Addition
1015 16th Ave | Moline, Illinois
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Terracon
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Bettendorf, IA

Boring Log No. B-4

Location: See Exploration Plan

Latitude: 41.4974° Longitude: -90.5232°

Model Layer	Graphic Log	Depth (Ft.)	Elevation: 694 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Sample Number	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI
1		0.2	**ASPHALT**, approx. 2" 693.8										
		1.0	**AGGREGATE BASE COURSE**, approx. 10" 693										
2			**FILL - LEAN TO FAT CLAY (CL/CH)**, brown				4	3-3-3 N=6	1		26.8		
		3.0	691										
3			**FAT CLAY (CH)**, brown, medium stiff				17	2-3-4 N=7	2		27.8		56-19-37
		5.0	689	5			24		3	1190	28.9	91	
			LEAN CLAY WITH SILT (CL), brown and gray, medium stiff		▽								
			with sand seams in Sample 4		▽		24		4		28.4		
				10									
							18	2-3-3 N=6	5		26.8		
		16.0	678	15									
4			**SILT (ML)**, gray, medium stiff				15	0-2-3 N=5	6		26.1		
				20									
							15	2-3-3 N=6	7		25.8		
				25									

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from Illinois Department of Natural Resources (IDNR) Elevation Finder Tool.

Water Level Observations
▽ 7½' while drilling
▽ 9' after drilling

Drill Rig
748

Hammer Type
Automatic

Driller
RP

Logged by
LW

Boring Started
02-01-2024

Boring Completed
02-01-2024

Notes

Advancement Method
Continuous-Flight Solid-Stem Auger

Abandonment Method
Boring backfilled with auger cuttings and bentonite chips upon completion. Surface capped with Asphalt patch after drilling.

Lincoln Irving Elementry School Addition
1015 16th Ave | Moline, Illinois
Terracon Project No. 07235203

Terracon
870 40th Ave
Bettendorf, IA

Boring Log No. B-4

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 41.4974° Longitude: -90.5232° Depth (Ft.) Elevation: 694 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Sample Number	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI
4		**SILT (ML)**, gray, medium stiff *(continued)*										
		29.0 trace sand at Sample 8 665										
3		**LEAN CLAY WITH SILT (CL)**, gray, medium stiff 30.0 664			X	16	2-3-3 N=6	8		27.3 25.0		
		Boring Terminated at 30 Feet	30									

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from Illinois Department of Natural Resources (IDNR) Elevation Finder Tool.

Water Level Observations
▽ 7½' while drilling
▽ 9' after drilling

Drill Rig
748

Hammer Type
Automatic

Driller
RP

Logged by
LW

Boring Started
02-01-2024

Boring Completed
02-01-2024

Notes

Advancement Method
Continuous-Flight Solid-Stem Auger

Abandonment Method
Boring backfilled with auger cuttings and bentonite chips upon completion. Surface capped with Asphalt patch after drilling.

Lincoln Irving Elementry School Addition
1015 16th Ave | Moline, Illinois
Terracon Project No. 07235203

Terracon
870 40th Ave
Bettendorf, IA

Boring Log No. B-5

Location: See Exploration Plan

Latitude: 41.4973° Longitude: -90.5229°

Model Layer	Graphic Log	Depth (Ft.)	Elevation: 694 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Sample Number	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI
1		0.2	**ASPHALT**, approx. 2" 693.8										
		1.0	**AGGREGATE BASE COURSE**, approx. 10" 693										
2		3.0	**FILL - SILTY SAND**, with gravel, trace brick fragements and trace organics, fine to coarse grained, dark brown and brown 691				8	9-11-8 N=19	1		11.3		
		6.0	**FILL - CLAYEY SAND**, with gravel and brick fragements, fine to coarse grained, brown and reddish brown 688	5			7	3-5-6 N=11	2		15.7		
3		16.0	**LEAN CLAY WITH SILT (CL)**, brown and gray, soft to medium stiff 678				15	6-2-2 N=4	3		13.7 31.0		
							24		4	1910	29.8	94	
				10	▽								
							24		5	1410	26.5	106	
4			**SILT (ML)**, gray, medium stiff to stiff	15									
							16	1-3-5 N=8	6		24.3		
				20									
							17	2-3-3 N=6	7		26.7		
				25									

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from Illinois Department of Natural Resources (IDNR) Elevation Finder Tool.

Water Level Observations
▽ 12' while drilling
▽ 12' after drilling

Drill Rig
748

Hammer Type
Automatic

Driller
RP

Logged by
LW

Boring Started
02-01-2024

Boring Completed
02-01-2024

Notes

Advancement Method
Continuous-Flight Solid-Stem Auger

Abandonment Method
Boring backfilled with auger cuttings and bentonite chips upon completion. Surface capped with Asphalt patch after drilling.

Lincoln Irving Elementry School Addition
1015 16th Ave | Moline, Illinois
Terracon Project No. 07235203

Terracon
870 40th Ave
Bettendorf, IA

Boring Log No. B-5

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 41.4973° Longitude: -90.5229° Depth (Ft.) Elevation: 694 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Sample Number	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI
4		**SILT (ML)**, gray, medium stiff to stiff *(continued)*										
		29.5 664.5				17	6-6-6 N=12	8		26.4 31.5		
3		30.0 **LEAN CLAY WITH SILT (CL)**, gray and dark gray 664	30									
		Boring Terminated at 30 Feet										

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from Illinois Department of Natural Resources (IDNR) Elevation Finder Tool.

Water Level Observations
▽ 12' while drilling
▽ 12' after drilling

Drill Rig
748

Hammer Type
Automatic

Driller
RP

Logged by
LW

Boring Started
02-01-2024

Boring Completed
02-01-2024

Notes

Advancement Method
Continuous-Flight Solid-Stem Auger

Abandonment Method
Boring backfilled with auger cuttings and bentonite chips upon completion. Surface capped with Asphalt patch after drilling.

Lincoln Irving Elementry School Addition
1015 16th Ave | Moline, Illinois
Terracon Project No. 07235203

Terracon
870 40th Ave
Bettendorf, IA

Boring Log No. B-6

Location: See Exploration Plan

Latitude: 41.4972° Longitude: -90.5232°

Model Layer	Graphic Log	Depth (Ft.)	Elevation: 694 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Sample Number	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI
1		0.2	**ASPHALT**, approx. 2" 693.8										
		1.0	**AGGREGATE BASE COURSE**, approx. 10" 693										
2			**FILL - POORLY GRADED SAND**, with gravel, trace brick fragments, fine to medium grained, brownish gray				14	11-17-18 N=35	1		13.4		
		3.0	691										
3			**FAT CLAY (CH)**, brown, medium stiff				5	2-3-4 N=7	2		29.6		
		5.0	689	5									
			LEAN CLAY (CL), brown and gray, soft to medium stiff				15	1-1-2 N=3	3		30.5		41-20-21
					▽								
							24		4	1710	30.8	98	
		10.0	684	10									
			LEAN CLAY WITH SILT (CL), gray, medium stiff to stiff										
							19		5	1890	26.9	103	
				15	▽								
							19	2-3-5 N=8	6		28.3		
		20.0	674	20									
			LEAN CLAY (CL), gray, medium stiff										
							17	2-3-3 N=6	7		26.7		
				25									

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from Illinois Department of Natural Resources (IDNR) Elevation Finder Tool.

Water Level Observations
▽ 8' while drilling
▽ 15' after drilling

Drill Rig
748

Hammer Type
Automatic

Driller
RP

Logged by
LW

Boring Started
02-01-2024

Boring Completed
02-01-2024

Notes

Advancement Method
Continuous-Flight Solid-Stem Auger

Abandonment Method
Boring backfilled with auger cuttings and bentonite chips upon completion. Surface capped with Asphalt patch after drilling.

Lincoln Irving Elementry School Addition
1015 16th Ave | Moline, Illinois
Terracon Project No. 07235203

Terracon
870 40th Ave
Bettendorf, IA

Boring Log No. B-6

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 41.4972° Longitude: -90.5232° Depth (Ft.) Elevation: 694 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Sample Number	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI
		LEAN CLAY (CL), gray, medium stiff *(continued)* 27.0 667										
3		**LEAN CLAY WITH SILT (CL)**, dark gray, medium stiff 30.0 664				18	2-3-3 N=6	8		27.0		
		Boring Terminated at 30 Feet	30									

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from Illinois Department of Natural Resources (IDNR) Elevation Finder Tool.

Water Level Observations
8' while drilling
15' after drilling

Drill Rig
748

Hammer Type
Automatic

Driller
RP

Logged by
LW

Boring Started
02-01-2024

Boring Completed
02-01-2024

Notes

Advancement Method
Continuous-Flight Solid-Stem Auger

Abandonment Method
Boring backfilled with auger cuttings and bentonite chips upon completion. Surface capped with Asphalt patch after drilling.

Lincoln Irving Elementry School Addition
1015 16th Ave | Moline, Illinois
Terracon Project No. 07235203

Terracon
870 40th Ave
Bettendorf, IA

Boring Log No. P-1

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 41.4982° Longitude: -90.5233° Depth (Ft.) Elevation: 694 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Sample Number	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI
1		0.5 **TOPSOIL**, approx. 6" 693.5										
3		**LEAN CLAY WITH SILT (CL)**, trace sand, brown and gray, soft to medium stiff				11	2-3-3 N=6	1		26.2		
						13	2-2-2 N=4	2		27.7		
			5			15	2-3-4 N=7	3		26.8		
				▽								
						10	2-2-2 N=4	4		29.2		
		10.0 684	10									
		Boring Terminated at 10 Feet										

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from Illinois Department of Natural Resources (IDNR) Elevation Finder Tool.

Water Level Observations
▽ 8' while drilling
▽ 8' after drilling

Drill Rig
748

Hammer Type
Automatic

Driller
RP

Logged by
LW

Boring Started
02-01-2024

Boring Completed
02-01-2024

Notes

Advancement Method
Continuous-Flight Solid-Stem Auger

Abandonment Method
Boring backfilled with auger cuttings and bentonite chips upon completion. Down hole plug installed near surface after drilling.

Lincoln Irving Elementry School Addition
1015 16th Ave | Moline, Illinois
Terracon Project No. 07235203

Terracon
870 40th Ave
Bettendorf, IA

Boring Log No. P-2

Model Layer	Graphic Log	Location: See Exploration Plan Latitude: 41.4982° Longitude: -90.5225° Depth (Ft.) — Elevation: 695 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Sample Number	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI
1		0.5 **TOPSOIL**, approx. 6" 694.5										
3		**LEAN TO FAT CLAY (CL/CH)**, gray and brown, medium stiff to stiff				17	2-4-4 N=8	1		26.5		
		3.0 692										
		LEAN CLAY WITH SILT (CL), gray and brown, medium stiff to stiff	5			18	2-2-3 N=5	2		29.4		
						16	4-4-4 N=8	3		28.2		
		soft to medium-stiff below about 8½'		▽		18	1-2-2 N=4	4		29.2		
		10.0 685	10									
		Boring Terminated at 10 Feet										

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from Illinois Department of Natural Resources (IDNR) Elevation Finder Tool.

Water Level Observations
▽ 8½' while drilling
▽ 8½' after drilling

Drill Rig
748

Hammer Type
Automatic

Driller
RP

Logged by
LW

Boring Started
02-01-2024

Boring Completed
02-01-2024

Notes

Advancement Method
Continuous-Flight Solid-Stem Auger

Abandonment Method
Boring backfilled with auger cuttings and bentonite chips upon completion. Down hole plug installed near surface after drilling.

Lincoln Irving Elementry School Addition
1015 16th Ave | Moline, Illinois
Terracon Project No. 07235203

Terracon
870 40th Ave
Bettendorf, IA

Boring Log No. P-3

Location: See Exploration Plan

Latitude: 41.4978° Longitude: -90.5229°

Model Layer	Graphic Log	Depth (Ft.)	Elevation: 695 (Ft.) +/-	Depth (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	Sample Number	Unconfined Compressive Strength (psf)	Water Content (%)	Dry Unit Weight (pcf)	Atterberg Limits LL-PL-PI
1		0.5	**ASPHALT**, approx. 6" 694.5										
		0.7	**AGGREGATE BASE COURSE**, approx. 2" 694.3										
2			**FILL - LEAN CLAY**, gray				11	2-2-3 N=5	1		23.7		
		3.0	692										
3			**FAT CLAY (CH)**, gray and brown, medium stiff				17	2-2-3 N=5	2		29.1		
		5.0	690	5	▽								
			LEAN CLAY WITH SILT (CL), gray and brown, soft to medium stiff				15	3-3-3 N=6	3		26.9		
							18	2-2-2 N=4	4		28.0		
		10.0	685	10									
			Boring Terminated at 10 Feet										

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevation Reference: Elevations were interpolated from Illinois Department of Natural Resources (IDNR) Elevation Finder Tool.

Water Level Observations
▽ 5' while drilling
None observed after drilling

Drill Rig
748

Hammer Type
Automatic

Driller
RP

Logged by
LW

Boring Started
02-01-2024

Boring Completed
02-01-2024

Notes

Advancement Method
Continuous-Flight Solid-Stem Auger

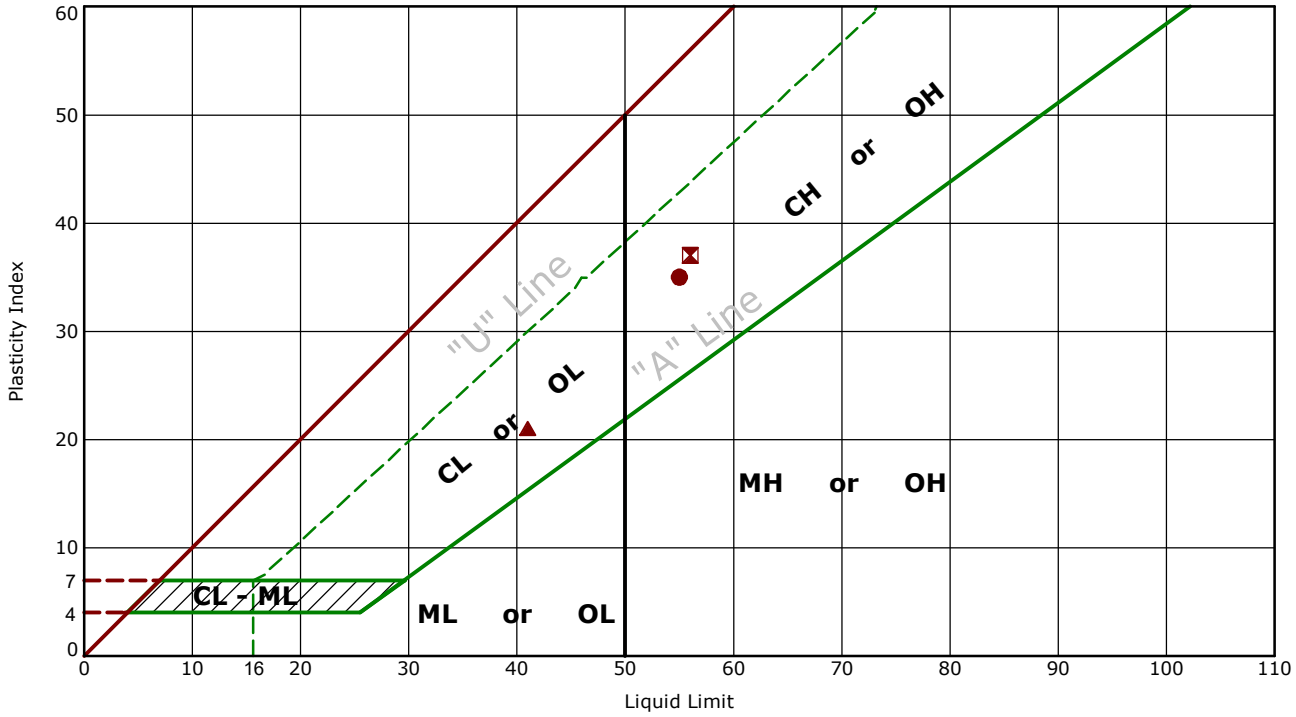
Abandonment Method
Boring backfilled with auger cuttings and bentonite chips upon completion. Surface capped with Asphalt patch after drilling.

Lincoln Irving Elementry School Addition
1015 16th Ave | Moline, Illinois
Terracon Project No. 07235203

Terracon
870 40th Ave
Bettendorf, IA

Atterberg Limit Results

ASTM D4318



	Boring ID	Depth (Ft)	LL	PL	PI	Fines	USCS	Description
●	B-2	3 - 5	55	20	35		CH	Fat Clay
⊠	B-4	3.5 - 5	56	19	37		CH	Fat Clay
▲	B-6	5.5 - 7	41	20	21		CL	Lean Clay

Supporting Information

Contents:

General Notes
Unified Soil Classification System

Note: All attachments are one page unless noted above.

Terracon
870 40th Ave
Bettendorf, IA

General Notes

Sampling	Water Level	Field Tests
Shelby Tube Standard Penetration Test	Water Initially Encountered Water Level After a Specified Period of Time Water Level After a Specified Period of Time Cave In Encountered Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.	N Standard Penetration Test Resistance (Blows/Ft.) (HP) Hand Penetrometer (T) Torvane (DCP) Dynamic Cone Penetrometer UC Unconfined Compressive Strength (PID) Photo-Ionization Detector (OVA) Organic Vapor Analyzer

Descriptive Soil Classification

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

Location And Elevation Notes

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

Strength Terms

Relative Density of Coarse-Grained Soils
(More than 50% retained on No. 200 sieve.)
Density determined by Standard Penetration Resistance

Relative Density	Standard Penetration or N-Value (Blows/Ft.)
Very Loose	0 - 3
Loose	4 - 9
Medium Dense	10 - 29
Dense	30 - 50
Very Dense	> 50

Consistency of Fine-Grained Soils
(50% or more passing the No. 200 sieve.)
Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance

Consistency	Unconfined Compressive Strength Qu (psf)	Standard Penetration or N-Value (Blows/Ft.)
Very Soft	less than 500	0 - 1
Soft	500 to 1,000	2 - 4
Medium Stiff	1,000 to 2,000	4 - 8
Stiff	2,000 to 4,000	8 - 15
Very Stiff	4,000 to 8,000	15 - 30
Hard	> 8,000	> 30

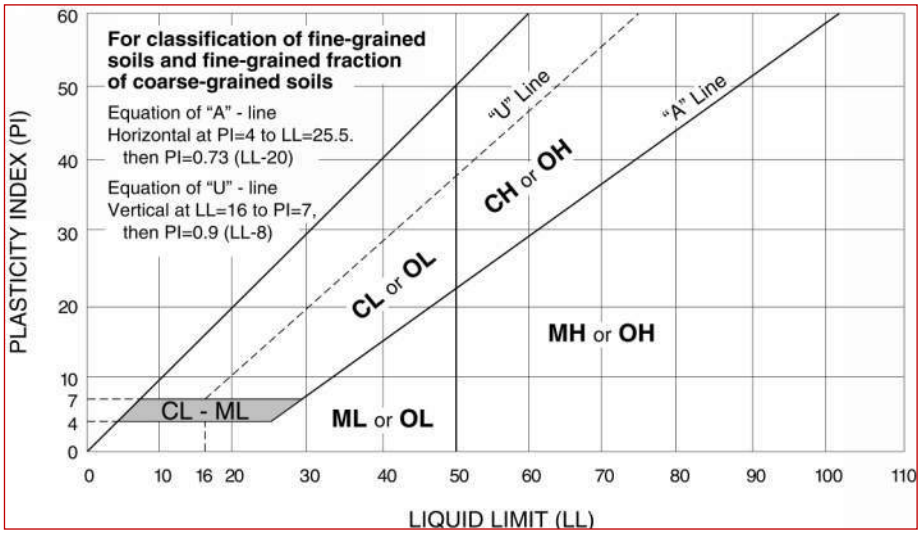
Relevance of Exploration and Laboratory Test Results

Exploration/field results and/or laboratory test data contained within this document are intended for application to the project as described in this document. Use of such exploration/field results and/or laboratory test data should not be used independently of this document.

Unified Soil Classification System

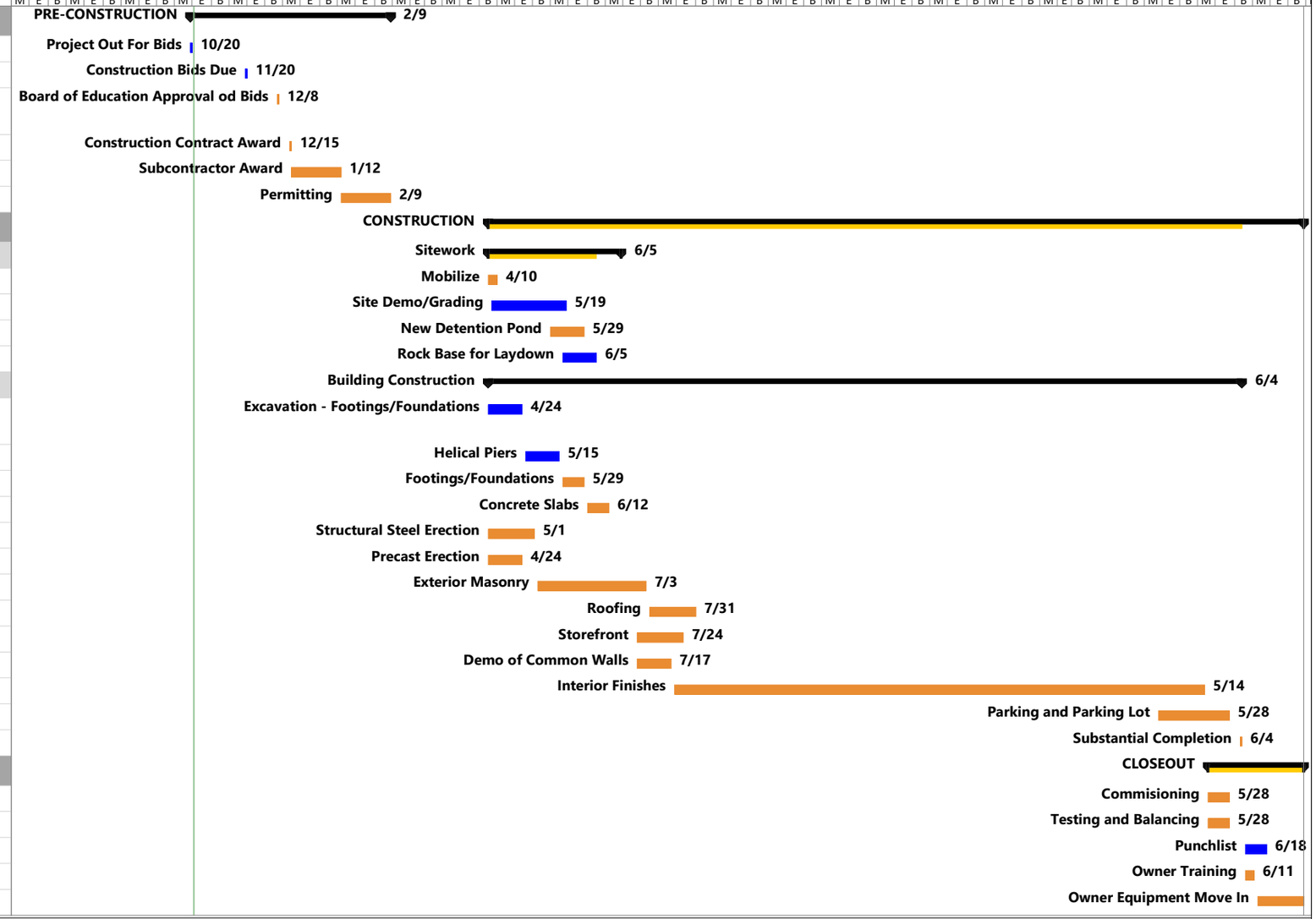
Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]				Soil Classification	
				Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 4 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	Cu≥4 and 1≤Cc≤3 [E]	GW	Well-graded gravel [F]
			Cu<4 and/or [Cc<1 or Cc>3.0] [E]	GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH	GM	Silty gravel [F, G, H]
			Fines classify as CL or CH	GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	Cu≥6 and 1≤Cc≤3 [E]	SW	Well-graded sand [I]
			Cu<6 and/or [Cc<1 or Cc>3.0] [E]	SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH	SM	Silty sand [G, H, I]
			Fines classify as CL or CH	SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots above "A" line [J]	CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]	ML	Silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OL	Organic clay [K, L, M, N]
					Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line	CH	Fat clay [K, L, M]
			PI plots below "A" line	MH	Elastic silt [K, L, M]
		Organic:	$\frac{LL\ oven\ dried}{LL\ not\ dried} < 0.75$	OH	Organic clay [K, L, M, P]
					Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor			PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.
[E] $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
[F] If soil contains ≥ 15% sand, add "with sand" to group name.
[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[H] If fines are organic, add "with organic fines" to group name.
[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.
[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.
[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.
[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.
[N] PI ≥ 4 and plots on or above "A" line.
[O] PI < 4 or plots below "A" line.
[P] PI plots on or above "A" line.
[Q] PI plots below "A" line.



Lincoln Irving School
Moline, IL
Master Construction Schedule

ID	Task Name	Duration	Start	Finish
1	**PRE-CONSTRUCTION**	**81 days**	**Mon 10/20/25**	**Mon 2/9/26**
2	Project Out For Bids	1 day	Mon 10/20/25	Mon 10/20/25
3	Construction Bids Due	1 day	Thu 11/20/25	Thu 11/20/25
4	Board of Education Approval od Bids	1 day	Mon 12/8/25	Mon 12/8/25
5	Construction Contract Award	1 day	Mon 12/15/25	Mon 12/15/25
6	Subcontractor Award	20 days	Tue 12/16/25	Mon 1/12/26
7	Permitting	20 days	Tue 1/13/26	Mon 2/9/26
8	**CONSTRUCTION**	**330 days?**	**Mon 4/6/26**	**Fri 7/9/27**
9	**Sitework**	**55 days?**	**Mon 4/6/26**	**Fri 6/19/26**
10	Mobilize	5 days	Mon 4/6/26	Fri 4/10/26
11	Site Demo/Grading	30 days	Wed 4/8/26	Tue 5/19/26
12	New Detention Pond	15 days	Mon 5/11/26	Fri 5/29/26
13	Rock Base for Laydown	15 days	Mon 5/18/26	Fri 6/5/26
14	**Building Construction**	**305 days**	**Mon 4/6/26**	**Fri 6/4/27**
15	Excavation - Footings/Foundations	15 days	Mon 4/6/26	Fri 4/24/26
16	Helical Piers	15 days	Mon 4/27/26	Fri 5/15/26
17	Footings/Foundations	10 days	Mon 5/18/26	Fri 5/29/26
18	Concrete Slabs	10 days	Mon 6/1/26	Fri 6/12/26
19	Structural Steel Erection	20 days	Mon 4/6/26	Fri 5/1/26
20	Precast Erection	15 days	Mon 4/6/26	Fri 4/24/26
21	Exterior Masonry	45 days	Mon 5/4/26	Fri 7/3/26
22	Roofing	20 days	Mon 7/6/26	Fri 7/31/26
23	Storefront	20 days	Mon 6/29/26	Fri 7/24/26
24	Demo of Common Walls	15 days	Mon 6/29/26	Fri 7/17/26
25	Interior Finishes	215 days	Mon 7/20/26	Fri 5/14/27
26	Parking and Parking Lot	30 days	Mon 4/19/27	Fri 5/28/27
27	Substantial Completion	1 day	Fri 6/4/27	Fri 6/4/27
28	**CLOSEOUT**	**40 days**	**Mon 5/17/27**	**Fri 7/9/27**
29	Commisioning	10 days	Mon 5/17/27	Fri 5/28/27
30	Testing and Balancing	10 days	Mon 5/17/27	Fri 5/28/27
31	Punchlist	10 days	Mon 6/7/27	Fri 6/18/27
32	Owner Training	5 days	Mon 6/7/27	Fri 6/11/27
33	Owner Equipment Move In	20 days	Mon 6/14/27	Fri 7/9/27



ESTES CONSTRUCTION
estesconstruction.com

CEDAR RAPIDS CORRIDOR
4900 Bowling St. SW, Ste. 100
Cedar Rapids, IA 52404
PHONE 319.213.9066

CENTRAL IOWA
220 SW 9th St., Ste. 180
Des Moines, IA 50309
PHONE 515.645.4481

QUAD CITIES
131 W 2nd St., Ste. 400
Davenport, IA 52801
PHONE 563.322.7301
FAX 563.322.2503

Dear Interviewee,

We have scheduled your post-bid interview for the enclosed project. Your interview details will be emailed to you.

The purpose of this interview is:

- Determine if this scope is complete and the firm has adequate labor resources to complete their scope per the project schedule. This tool is used for scope leveling purposes to determine if an award recommendation can be made to the Owner. This meeting does not guarantee a contract award as it will be used to level scope amongst all bidders. Estes routinely interviews multiple firms to ensure the most capable party is selected for the project.
- Thoroughly understand the scope of work, schedule requirements, and durations.
- Discuss expectations of design intent or other items of conflict in the design documents.
- Discuss coordination between trades during construction.
- Discuss scheduling expectations including submittal preparation, approval time frame, fabrication, delivery time frame, construction installation duration including confirmation of adequate labor resources to complete the work per the schedule.
- Review jobsite policies, facilities, and requirements.
- Set expectations of safety procedures required to protect public and facility staff, as well as workforce safety requirements.
- Review intended product manufacturers and verify sub-contracted work, if any.

The intent of this process is to fully discuss and agree on all project details and expectations so Estes Construction can determine if a contract will be awarded. The owner, designers, engineers, and our project team could all be represented in this interview. We require that you to invite your field personnel that will be leading your crews so that they also are aware of all expectations and agreements for this project.

Included with this letter are forms for your review and completion. Please complete and return to me prior to your scheduled interview. Confirm with your insurance agency your ability to meet the specified insurance requirements.

We look forward to talking with you, and feel free to contact us with any questions.

Sincerely,

ESTES CONSTRUCTION

POST-BID INTERVIEW

Project:

Firm:

Date:

Attendees:

Proposal is based on Plans & Specifications and Addenda noted	Plans & Specs, Addenda and Date:			
Scope Review & Clarifications	**yes**	**no**	**n/a**	**Comments**
Are the plans and specifications clear with no exceptions to note?				
Is sales tax included in the proposal cost?				
Is the full scope of work clear with no clarifications needed?				
Professional Liability Required? Required when providing Engineering or Design Services (including field design)				
Pollution Liability Required? Required when providing remediation, treatment, storage or disposal of waste/hazardous materials, EFIS, Demolition and/or Earthwork				
In agreement with the proposed contract form?				Retainage Value _____% Pay App _____ day of ea mo.
Any specific inclusions? If yes, explain.				
Item:				
Any specific exclusions? If yes, explain.				
Item:				
Is the scope of work bid as specified? If alternative materials or methods are recommended, please list.				
Was site/existing conditions reviewed & analyzed in preparing the proposal?				
Are all special coordination issues with other trades clear?				
Are you performing all of your own work? If no, describe work & all subcontractors.				

Will your company furnish all material needed for complete installation? If no, list items, dates needed & who furnishes.				
Are all testing requirements included in your proposal? If no, please list testing provided by others.				
Have all value engineering/alternative proposals been included in this bid? If no, provide additional VE options				
Please check the following boxes to indicate what your firm is providing for the work to be contracted:				
Equipment & manpower necessary for receiving, hoisting, and material handling?				
Temporary controls/protection/enclosures?				
Layout work/survey/field measurements?				
Permits/regulatory requirements/fees paid?				
Testing/balancing/training operations?				
Daily clean-up/debris disposed to Estes dumpster ☐ or off-site ☐ Check One.				
Scope Review & Clarifications	**yes**	**no**	**n/a**	**Comments**
Understand invoicing including schedule of values?				
Any specific safety concerns, issues, or procedures to review and discuss?				
It is understood & acknowledged that PPE is required at all times, by employees and subcontractors.				
It is understood & acknowledged that JHA's (Job Task Analysis) is required to be completed & submitted daily to the Estes field team.				
Do you have a written silica plan?				
Is a crane needed? If so, a lifing plan, rigging procedure,and a competent person needs to be given to Estes 3 weeks prior to any hoisting.				
Will you have a field office or storage container?				

Schedule Review	yes	no	n/a	Comments
Are there any special activity sequencing requirements?				
Do you understand the coordination requirements of your contract?				
Is your Company taking care of all drilling, sealing, fire caulking of penetrations needed for your scope of work?				
Does this proposal include all incidentals for your work?				
Does this proposal reflect working during normal business hours only? If no, please describe hours of operation.				

Performance: List each major activity of work.

Description	Task start date	Duration of task	Labor Hours

Submittal Process	yes	no	n/a	Comments
Understand submittal requirements (I.e.--shop drawings, samples, mock-ups, etc.)?				

Submittals: List each item required on the following lines, and date that these would be provided.

Description	Duration of submittal prep	Submittal due date to Estes	Lead time after approvals

Labor Rates	yes	no	n/a	Comments
Is it understood that change order markups for self performed work is limited to 10% OH and 5% Profit with only a 5% Markup on sub-contractor work?				

Provide proposed labor rates for change order work

Position	Regular Time	1.5x	2x

Closeout Process	yes	no	n/a	Comments
Understand the closeout requirements? *Note final payment will not be released until all documents have been received				
Understand the workmanship quality expectations set forth in the specifications?				
If no specs, complying to industry/manufacturer standards?				

Completion Requirements

A mandatory completion meeting is required to be attended by all contractors, designers & the client a minimum of **eight weeks prior to the scheduled substantial completion date** to review project completion requirements.

Completion Meeting Agenda:
Confirm substantial completion date
Identify potential problems, incomplete systems or delays that could impact the completion date, if any.
Discuss remaining outside agency inspections required--electrical, plumbing, heating, elevator, etc.
Must be done prior to final inspection by fire marshal & building inspector--specify date
Discuss possible solutions to potential completion date delays
Establish date for owner/operator training and commissioning
Establish date when construction team will compile the punchlist
Date when punchlist will be sent to contractors with completion deadline
Items on punchlist must be completed no later than substantial completion date.
Superintendent must be notified in writing when punchlist items are complete.

Set definition of what is punchlist and what is warranty.

Closeout documents including, but not limited to warranties, operation and & maintenance instructions, and test reports shall be submitted **no later than two weeks prior** to substantial completion.
O & M's
As-builts
Attic stock (who will accept delivery - sign off at receipt and where is it to be stored?)
Final Billing/Final Waivers
Warranty
Commissioning, test and balance reports

Owner-provided furniture, fixtures and equipment
Owner move-in date

Mandatory close-out meeting attended by owner, architect, and subcontractors **one week after substantial completion date** to address incomplete contract requirements and uncompleted punch list. See Close-Out Meeting Agenda above.

Submitted by (Subcontractor):

Date:

Accepted by PCM (Estes):

Accepted by PM (Estes):

Accepted by Superintendent (Estes):

Additional Notes:

General Information & Point of Contact Form

Job Name:

Estes P.O./ Job #:

Estes Office:	**Address:**	**Phone:**	**Email**

All emails are @estesconstruction.com

Point of Contact	**Name**	**Telephone**	**Email (name@)**
Project Manager		Cell:	
Project Coordinator		Office:	
Project Engineer		Cell:	
Superintendent		Cell:	
Safety Manager		Cell:	
Invoicing & Lien Waivers		Office:	accountspayable@
Contracts & Insurance		Office:	contracts@
BIM Coordinator		Cell:	

Subcontractor Information *(REQUIRED**)*

Contractor Office:	**Address:**	**Phone:**	**Email**

Point of Contact	**Name**	**Telephone**	**Email**
Contract Signee**			
Project Manager**			
Invoicing**			
Lien Waivers/ Insurance**			
Submittal Manager(s)** (Submittals/Close-Out Docs)			
RFQ Manager** (Quotes/RFP's/ASI's)			
Project Coordinator/Assistant			
Superintendent / Foreman			
Safety Manager			
Jobsite Meeting Attendees			
Other			

Additional Information

Is your jobsite meeting attendee able to make decisions for the company and what is their level of authority?	
What is the current company backlog volume and number of projects?	
What is the company's average volume & number of projects over the past 3 years?	
What is the company's current EMR and TRR safety ratings?	
What is the company's FEIN Number?	
What is the company's current bond rates and bonding capacity?	

Attach additional sheets, forms, schedules, letters, information, etc. as needed to provide complete information.

Estes Construction utilizes **DocuSign** exclusively for contract review and signature. Only documents signed using **DocuSign** e-signature for verification will be accepted as valid. You do not need a **DocuSign** account to sign these documents electronically and there is no cost to you for this service. A link to the fully executed copy of each contract will be provided by **DocuSign**.

Some basic instructions follow to help you navigate the **DocuSign** features:



You will receive an email notification from **DocuSign NA3 System** <dse_NA3@docusign.net> on behalf of contracts@estesconstruction.com,

Open the email
Click on REVIEW DOCUMENT
This will link you directly to the document requiring your action.



You must consent to the use of *Electronic Records and Signatures* to continue [check box]

Click **CONTINUE** to start the review process

Ready to **REVIEW & SIGN**? Click CONTINUE

NOT READY TO SIGN OR ASSIGNING TO SOMEONE ELSE, click **OTHER ACTIONS**.



The START flag in the upper left corner will begin the review process

NEXT will direct you through each page of the document.

If you have no questions or exceptions to the document ⓘ, **SIGN*** where indicated and you're done!

***FIRST TIME** **DocuSign** users will need to confirm their name and select a signature field. You will be prompted to adopt one of the pre-formatted signature/initial options. **DocuSign** will default to the signature option you choose for all future documents.

You will be offered the opportunity to sign up for a FREE **DocuSign** account. This is not required in order to process the document Estes has sent to you for signature.

OTHER ACTIONS drop down arrow offers several options:

FINISH LATER: Use this if you're not ready to sign. Return to the email & click **REVIEW DOCUMENT** to restart process.

ASSIGN TO SOMEONE ELSE: Enter new signer name & email address. Email will be forwarded by DocuSign, you become a "CC" recipient and Estes will be notified of the Change In Signers.

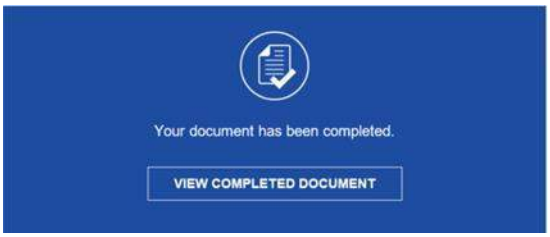
DECLINE TO SIGN: Voids the document. It can no longer be viewed or signed.



REMINDER

Contracts in DocuSign will expire after 30 days and will no longer be available for review or signature.

After all necessary signatures are obtained, you will receive another email notification from **DocuSign** with a link to the fully executed document which can be downloaded for your records.



This is the only copy being provided.
Fully executed contracts will not be mailed or emailed

PLEASE DIRECT ANY QUESTIONS OR CONCERNS TO THE CONTRACTS DEPARTMENT
contracts@estesconstruction.com

MASTER BUILDERS OF IOWA

JHA FORM

Version 1.1
Issued 2023

JHA Completed by: _____

Contractor Name: _____

Work Location: _____

Date: _____

Scope of Work: _____

High Risk Activities

HRA *(Check all that apply) (P) indicates permit required*

- ☐ Electrical
- ☐ Lockout/Tagout (P)
- ☐ Confined Spaces (P)
- ☐ Material Handling
- ☐ Hazardous Materials
- ☐ Lifting Operations (P)
- ☐ Ground Disturbance (P)
- ☐ Driving
- ☐ Mobile Equipment
- ☐ Working from Heights

PPE - Identify Needs

- ☐ Hard Hat
- ☐ Hearing Protection
- ☐ Safety Glasses
- ☐ Face Shield
- ☐ Spoggles
- ☐ Respirator
- ☐ Nomex Suit
- ☐ Gloves
- ☐ Tyvek Suit
- ☐ Chaps
- ☐ Metatarsal Guards
- ☐ Other _____
- ☐ Cut Rated Sleeves
- ☐ Rubber Boots

Permits Required *(Check all that apply)*

- ☐ Hot Work
- ☐ Daily Lift Plan
- ☐ Silica Explosure Control Plan
- ☐ Ladder
- ☐ Other _____
- ☐ Confined Space
- ☐ Daily Dig Permit
- ☐ Roof Access

Fall Protection *(Check all that apply)*

Required at a height of: ☐ Feet

Is Fall Protection provided? ☐ YES ☐ NO

Harness in a Good Condition: ☐ YES ☐ NO

Anchor Point Identified & Capable of Supporting 5,000 lbs. per worker ☐ YES ☐ NO

Harness Equipped with Suspension Straps? ☐ YES ☐ NO

Methods of Fall Protection *(Check all that apply)*

- ☐ Guards
- ☐ Fall Protection
- ☐ Travel Restrain
- ☐ Safety Nets

- ☐ 6' Lanyard
- ☐ Beamer
- ☐ Rope Grab
- ☐ Cross Arm Strap
- ☐ Scissor Lift
- ☐ Aerial Lift
- ☐ Horizontal Life Line
- ☐ Concrete Anchor
- ☐ Retractable
- ☐ Other _____

Potential Swing Hazards Identified & Controlled? ☐ YES ☐ NO

Rescue plan in place ☐ YES ☐ NO

What is the rescue plan? ☐ Ladder ☐ Aerial Lift ☐ Scissor Lift ☐ Winch ☐ Other _____

Special Considerations

Are there any **Caught Between/Struck By** hazards with this task? ☐ YES ☐ NO

If Yes, Explain _____

Are there concerns with **Eyes on Path** hazards (surroundings, walkways) ? ☐ YES ☐ NO

If Yes, Explain _____

Are there concerns with **Body Mechanics** (strains, sprains, etc)? ☐ YES ☐ NO

If Yes, Explain _____

Was Stretch & Flex performed today? ☐ YES ☐ NO

3 Level Inspection

Identify the hazards:

Above Head

Torso

Below Knee

Electrical Work

Cords Inspected? ☐ YES ☐ NA

GFCI Inspected ☐ YES ☐ NA

Barricades

☐ Red Danger Tape ☐ Yellow Caution Tape ☐ Safety Cones

☐ Orange Fencing ☐ Jersey Barriers ☐ Other

Does the work require a Competent Person per OSHA? ☐ YES ☐ NO

Scaffolding/Excavation/Cranes/Slings/Fall Protection/Ladders/Welding/Silica

Competent Person_____

Grinders & Tools with Guards

Handle On? ☐ YES ☐ NO Guard on? ☐ YES ☐ NO

Inspected? ☐ YES ☐ NO Pneumatic? ☐ YES ☐ NO Whip Checks? ☐ YES ☐ NO

SEQUENCE OF STEPS	LIST HAZARDS	METHOD TO ELIMINATE OR CONTROL HAZARDS

JHA Confirmation

_____Employees

_____Employees

_____Supervisor

_____Controlling Contractor

STORM WATER POLLUTION PREVENTION PLAN
LINCOLN IRVING SCHOOL
MOLINE, ILLINOIS

PROJECT AREA DESCRIPTION

Lincoln Irving School is a 3.55 acre commercial school improvement project located in Moline, Illinois. It is bounded by 14th Avenue to the north, 10th Street to the west, 11th Street to the east, and 16th Avenue to the south. Drainage currently drains south to City storm sewers. Refer to plans for a project location map.

Construction activities that can cause soil disturbance include site clearing and grubbing, site grading, utility installation, building construction, and paving construction. These activities, particularly site grading, will occur over approximately 3.0 acres of the property. There is no known water quality data for runoff on this site. Refer to attached soils report from the USDA Natural Resources Conservation Services.

EXISTING SITE CONDITIONS

The existing site is currently a developed school property and some properties that were previously single family residential homes that are being removed for the school improvement project. The entire property has previously been disturbed.

AREA DISTURBED BY CONSTRUCTION ACTIVITY

This project contains 3.55 acres, of which approximately 3.0 acres will be disturbed by construction activity. It is the intent of the owner to seed and reach final stabilization by August 2027.

CONSTRUCTION ACTIVITY WILL GENERALLY CONSIST OF THE FOLLOWING

Installation of construction drive and perimeter erosion control, clearing and grubbing, rough grading, storm sewer installation, sanitary sewer service installation, water service installation, paving, buildings, pavement back fill, final grading and final seeding.

RUNOFF COEFFICIENT

The runoff coefficient following complete construction including building and site development is expected to be 0.81 for the 3.55 acres draining to the proposed underground detention pond. The pre-development runoff coefficient is 0.63. The pre-development amount of impervious area is 2.14 acres. The post-development amount of impervious area is 2.91 acres.

SITE MAP

A complete site map detailing drainage patterns, slopes, proposed controls, and other related information is shown on the Erosion Control Plan and Drainage Report included in these construction plans.
Attached is a soil map from the USDA Natural Resources Conservation Services showing soil types for said project.

RECEIVING WATERS

Receiving waters: Unnamed tributary to the Mississippi River.

SITE FEATURES AND SENSITIVE AREAS TO BE PROTECTED

Description of unique features that are to be preserved: None.

Describe measures to protect these features: General grading erosion control measures.

ENDANGERED SPECIES CERTIFICATION

Are endangered or threatened species and critical habitats on or near the project area? No

Describe how this determination was made: Previously disturbed area and EcoCAT.

HISTORIC PRESERVATION

Are there any historic sites on or near the construction site? No

Describe how this determination was made: Review of federal, state, local, and tribal historic preservation information. Also, previously disturbed area. SHPO clearance.

EROSION AND SEDIMENT CONTROLS

Controls will generally consist of those specific items as depicted on the grading plan and are the responsibility of the contractor/subcontractor responsible for the installation of these controls. These controls shall meet the requirements of the City's Erosion Control Officer and should be installed in accordance with the Illinois Urban Manual. Following is (A.) the sequence of construction and the corresponding erosion control methods that are to be used, and (B.) the required stabilization and structural practices that are to be used.

SEQUENCE OF CONSTRUCTION ACTIVITES

1. Prior to any work on site:
   The contractor is to install a temporary vehicle tracking control drive to minimize the amount of dirt tracking into the street used for access. Perimeter silt fence is to be installed before any work on site is started. A construction staging area is to be utilized on site in a location that is minimally affected by storm water runoff. This is the location that all construction materials shall be stored. A description of the materials to be stored on site is available from the contractor.
2. Clearing and Grubbing:
   Check to make sure all silt fence is in place and in good working order. Clearing and grubbing is to occur only if rough grading is to commence in 21 days or less of this phase. Clear all areas that will be affected by construction activity. No materials are to be buried on site. Disposal of waste materials shall be performed in accordance with local ordinances and applicable state and federal laws. A plan of disposal is available from the contractor.
3. Rough Grading:
   Check to make sure all perimeter silt fence is in place and in good working order. Construction of any diversion dikes and/or silt basin are to be constructed first to prevent any erosion from leaving the site. After completion of rough grading, all interior silt fence and/or other erosion control measures are to be installed. Any area that will permanently cease construction shall be permanently seeded immediately;

or will not be disturbed within 14 days during utility construction or paving shall be temporarily seeded until work commences.

4. Sanitary Sewer Construction:
   Check to make sure all silt fence and other erosion control measures are in place and in good working order. Install sanitary sewer and place permanent seeding on any areas that are not to be disturbed by future construction activity immediately.

5. Water Main Construction:
   Check to make sure all silt fence and other erosion control measures are in place and in good working order. Install water main and place permanent seeding on any areas that are not to be disturbed by future construction activity immediately. Any water main flushing will be directed so that all discharge passes through the silt basin, if one is constructed.

6. Storm Sewer Construction:
   Check to make sure all silt fence and other erosion control measures are in place and in good working order. Install storm sewer and place permanent seeding on any areas that are not to be disturbed by future construction activity immediately. Storm outlets shall be protected using rip rap and engineering fabric. Protect all storm inlets from erosion detention into the storm sewer by use of inlet protection approved by the City.

7. Paving Construction:
   Check to make sure all silt fence and other erosion control measures are in place and in good working order. Perform final compaction and trimming of the subgrade, place and compact aggregate base (if applicable), and construct all concrete pavement, curbs and gutters, box-outs for intakes and manholes, and prepare for final curb backfill. Protect all storm sewer intakes with an approved erosion control method, which are to be left in place until final stabilization is reached. Silt fence or equivalent control measure shall be installed near the back of curb after roadway is completed.

8. Building Construction:
   Check to make sure all silt fence and other erosion control measures are in place and in good working order. Construct proposed building(s) being careful to minimize soil being tracked onto streets.

9. Final Grading:
   Check to make sure all silt fence and other erosion control measures are in place and in good working order. Remove all interior erosion control measures long enough to complete final grading, being sure to reinstall all measures until final stabilization is met. Final stabilization shall be when a 70% vegetative density has been achieved and no more construction activities are anticipated. At this time all erosion control measures can be removed, and any silt basin shall be cleaned out, re-graded, seeded, and mulched.

STABILIZATION, STRUCTURAL PRACTICES AND STORM WATER MANAGEMENT

Stabilization measures shall be initiated immediately on all disturbed areas where construction activity will not occur for a period of 14 or more calendar days or where construction as permanently ceased. Structural stabilization practices should be installed as discussed and placed on upland soils to the degree attainable in accordance with the Illinois Urban Manual.

1. Permanent Stabilization Practices:
   Individuals engaged in land disturbing activities shall minimize soil compaction and preserve topsoil that exists on site. During mass grading operations, topsoil shall be stripped, stockpiled, and spread over the entire site prior to final stabilization of stockpiled in a designated controlled area(s) for later use of individual lot construction. Excess topsoil may be removed from the site only upon written approval of the city engineer and only where the individual can show that the additional topsoil is not needed to meet the city's stormwater requirements. Permanent seeding and planting of all disturbed areas by

seeding, fertilizing, and mulching shall be completed after final grading is finished. This shall occur in a time of year that is appropriate for seed germination. Existing vegetation in areas not disturbed during construction shall be maintained. This shall be in accordance with City standard specifications. Any disturbed areas in the City Right-of-way (ROW) shall be seeded, fertilized, and mulched or blanketed per City standards.

2. Permanent Structural Practices:
   Outlet protection is required for all storm sewer outlets using rip rap and engineering fabric. Curbs and gutters along pavement to a storm sewer system will be used to collect storm water. Finally, once storm inlets are installed, filter tubes shall be placed around all inlets.

3. Temporary Stabilization Practices:
   If construction activity will cease after stripping and stockpiling for 14 or more days, temporary seeding (oats at a rate of 65 pounds per acre and annual rye grass at a rate of 40 pounds per acre or approved equal by the City) and mulching shall be placed immediately. Silt fence or approved equal may be used to temporarily check flows on site and help protect intakes and manholes on site. Inlet protection shall be approved by the City Erosion Control Inspector prior to installation. In areas where flows may run offsite, silt fence shall be placed on the perimeter of the site prior to grading operations. Frequent watering of the grade on site shall also be practiced minimizing dust pollution on site.

4. Temporary Structural Practices:
   Temporary sediment basin shall be provided at a rate of 3,600 cubic feet of storage per acre of drainage areas over 5 acres. Over-excavate underground detention basin 1 foot to serve as temporary sediment basin until underground detention system is installed on site. If these requirements cannot be attained, a combination of silt fences, sediment traps and/or other sediment trapping measures may be used. Temporary sediment traps may be used for drainage areas up to 5 acres in size.

5. Other Controls:
   All disposal of construction materials and waste shall follow all local, state, and federal regulations for disposal of such materials. The contractor is also responsible for the construction and maintenance of a temporary crushed rock entrance into the project to minimize the amount of tracking from the site. The bordering streets shall be inspected daily and any significant tracking shall be cleaned up immediately. Any trucks hauling material into or out of the site shall be covered by a tarpaulin to reduce material spillage.

6. Storm Water Management:
   Storm water drainage will be provided by curb and gutter, and storm sewers, which drain to the underground detention system. The overflow of the detention basin is a paved area that overflows to the street. All pipe outlets will be stabilized with rap-rap and engineering fabric to reduce erosion at the pipe outlet.

MAINTENANCE/INSPECTION

All site controls shall be maintained in good working order by the contractor until final stabilization is reached for the specific area a control has been placed for. Maintenance shall be performed as required following site inspections, and shall be accomplished as soon as practicable, but not more than 7 days, after notice is given by the inspector. All maintenance shall be recorded in the project log-book which shall be kept on site and maintained by the agent designated by the owner. After project acceptance, maintenance on the property shall be by the owner.

Following are maintenance and inspection practices to be used on this project:

1. All control measures will be inspected at least once every 7 days.
2. All erosion control measures shall be kept in good working order; if a repair is necessary, it will be initiated as soon as practicable, but no later than 7 calendar days, of the report.
3. Sediment buildup shall be removed when the sediment height is 1/3 the height of the silt fence or higher.
4. Silt fence will be inspected for accumulation of sediment, fence tears, proper fence attachment, and to insure fence posts are securely attached to the ground.
5. Sediment basin, if present, shall be inspected for sediment buildup, and sediment shall be removed when it reaches 50% of the design capacity or after the job has reached final stabilization.
6. Any diversion dikes that are used shall be inspected and any breaches shall be corrected immediately.
7. Temporary and permanent seeding and planting shall be inspected for healthy growth, bare spots and any washouts.
8. Dust generation on site shall be kept to a minimum and shall be corrected immediately through watering of the site with only enough water to prevent dust generation and no more.
9. A maintenance inspection report will be made after each inspection and will be recorded in the inspection log for the project. In particular, the report shall include:
    a. Dates erosion control measures are installed.
    b. Dates when major grading activities occur on-site
    c. Dates when particular phases of construction are ceased (both temporarily and permanently).
    d. Dates when stabilization of an area on-site is reached.
10. A qualified inspector shall complete the inspection and reports as outlined. This person is to be knowledgeable in the erosion control methods being used in this project and shall be capable of assessing the effectiveness of these erosion control methods on site, as well as the maintenance practices required for these methods.
11. The Storm Water Pollution Prevention Plan (SWPPP) and Erosion Control Plan shall be updated to reflect any changes to site features and operations. The plans must also be changed when the inspector observes that current practices are not effective in minimizing pollutant discharge from the site. Additionally, the SWPPP shall be updated to:
    a. Include contractors identified after submittal of the Notice of Intent. These contractors shall certify the plan and be identified as co-permittees.
    b. Identify any change(s) in ownership or transference of the permit and permit responsibilities.

INVENTORY FOR POLLUTION PREVENTION PLAN

The materials or substances listed below are expected to be present on-site during construction of this project.

1. Concrete
2. Concrete Curing Substances
3. Detergents
4. Paints (enamel and latex)
5. Tar
6. Fertilizers
7. Petroleum Based Products
8. Cleaning Solvents

MATERIAL MANAGEMENT PRACTICES

Following are the material management practices that are to be used on site to reduce the risk of spill or other accidental exposure of materials and substances to storm water runoff.

GOOD HOUSEKEEPING

1. Store only enough product on-site to complete the project.
2. All materials that are to be stored on-site shall be kept in a neat and orderly manner in their appropriate containers, clearly marked, and under a roof, if possible.
3. Products are to be kept in their original manufacturer's container with the original manufacturer's label.
4. Substances will not be mixed with one another unless recommended by the manufacturer.
5. Whenever possible all the contents of a products container will be used before disposing of the manufacturer's container.
6. Manufacturer’s recommendations for proper use and disposal shall be followed.
7. The site superintendent will inspect the site for proper use and disposal of materials every day.

HAZARDOUS MATERIALS

The following practices are to be used to reduce the risk associated with the use of hazardous materials:

1. Products will be kept in their original containers unless the containers are not resealable.
2. Original labels and material safety data sheets will be saved for future reference.
3. If surplus product must be disposed of, manufacturer’s, local, and state recommended methods for proper disposal will be followed.

PRODUCT SPECIFIC PRACTICES

1. Petroleum Products:
   All on-site vehicles will be monitored for leaks and shall receive regular preventative maintenance to reduce the chance of material leakage. Petroleum products will be stored in tightly sealed containers, which are clearly labeled. Any asphalt substances used on-site will be applied according to manufacturer's specifications. Any on-site petroleum storage tanks shall be located on an impervious surface and shall be maintained to prevent any leakage.

2. Fertilizers:
   Fertilizers used will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to any storm water. Storage of fertilizers shall be in its original manufacturer's container and under a covered shed whenever possible. Contents of any partially used bag or container shall be placed into resealable bags or containers when not being used.

3. Agricultural Activities:
   Runoff from agricultural loads may contain chemicals including herbicides, pesticides, fungicides, and fertilizers. Existing farming erosion measures shall be left in place where feasible to help reduce the effects of these runoffs.

4. Paints, Paint Solvents, and Cleaning Solvents:
   All containers will be tightly sealed and stored when not in use. Excess paint will not be discharged to the storm sewer system or into any drainage ditch. Excess paint will be properly disposed of according to manufacturer's, local, and state regulations.

5. Concrete Waste:
   Concrete trucks will be allowed to washout or discharge surplus concrete at a specified location on site that will minimize the potential for storm water contact with these materials. The concrete washout area, method, and location shall be approved by the City Erosion Control Inspector prior to installation. Berms and silt fence may be used to divert any flows into the washout location and any flows out from the concrete washout locations. The waste concrete shall either be disposed of as non-hazardous waste or broken up and used on site in an appropriate manner.

6. Solid and Construction Waste:
   A construction dumpster is to be located on site in the designated staging area. All construction debris and materials are to be placed into the dumpster on site and are not to be buried on site. This dumpster is to be emptied once a week or as construction needs require.

7. Sanitary Waste:
   A portable restroom facility shall be located in the designated staging area at all times unless an approved equal is available. Waste shall be collected and disposed of as required by all local, state, and federal regulations.

All items above shall be documented on the SWPPP at time of placement. If relocated the SWPPP shall be revised to show such.

SPILL CONTROL PRACTICES

The contractor is responsible for the training of all personnel in proper use and spill cleanup of all materials used in the work they are completing. If a spill occurs, no storm water contact will be allowed, and the spill is to be cleaned up immediately. If storm water contact does occur, the storm water is to be contained on site and disposed of in a manner that meets all local, state, and federal regulations. In the case of a material spill the following practices will be followed:

1. Manufacturer's recommended methods for spill cleanup will be clearly posted on site, site personnel will be made aware of the cleanup procedures, and the location of the cleanup supplies.
2. Materials and equipment necessary for spill cleanup will be kept in the material storage area on-site. Equipment and materials will include but are not limited to brooms, dust pans, mops, rags, gloves, goggles, cat litter, sand, sawdust, and plastic and metal trash containers specifically for this purpose.
3. All spills will be contained and cleaned up immediately after discovery.
4. The spill location shall be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury during the spill cleanup.

5. Spills of toxic or hazardous materials will be reported to all appropriate state and local government agencies regardless of size. The contractor is responsible for contacting the EPA if any spills are of a size that is larger than the quantities outlined by federal regulations.
6. If the spill exceeds reportable quantity, the SWPPP shall be modified in no less than 14 days from the inspection report and shall reflect all the changes in erosion control measures that were enacted due to this spill. The SWPPP shall record a description of the release, an explanation of why the spill occurred, a description of measures enacted to prevent any future spills and/or release of materials, method of spill cleanup used, and procedures for disposal of the material.
7. The site superintendent is responsible for day-to-day site operations and will be the spill prevention and cleanup coordinator. They will designate at least three other site personnel who will receive spill prevention and cleanup training. These individuals will each become responsible for a particular phase of prevention and cleanup. The names of responsible spill personnel will be posted in the material storage area or office trailer on site if one is present.

NON-STORM WATER DISCHARGES

It is expected that the following non-storm water discharges will or possibly will occur from the site during construction. By IL EPA standards these discharges cannot come into contact with pollutants either before or after discharge onto the site. All discharges will be directed to the sediment basin on site if one is used.

1. Water from water main flushing.
2. Water from any vehicle and/or building wash downs excluding any detergents.
3. Pavement wash waters where no spills or leaks of toxic or hazardous materials have occurred.
4. Uncontaminated ground waters from dewatering excavation.
5. Water used to fight fires on site.

DISCHARGES FROM ASPHALT AND CONCRETE PLANTS

No asphalt or concrete plants are anticipated for this project site.

CERTIFICATION STATEMENTS

OWNER

I certify under penalty of law that this document and that all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Moline Coal Valley School District
1900 52nd Avenue
Moline, IL 61265

By:_____

Title:_____

Date:_____

CONTRACTOR(S)

For each erosion control measure, the General Contractor must clearly identify the subcontractors that will implement the measures identified in this Storm Water Pollution Prevention Plan. All subcontractors coming on-site must sign a certification statement before conducting any work at the site identified in the SWPPP.

I certify under penalty of law that I understand the terms and conditions of the general National Pollution Discharge Elimination System (NPDES) permit that authorizes the storm water discharges associated with industrial activity from the construction site as part of this certification. Further, by my signature, I understand that I am becoming a co-permittee, along with the owner and other contractors and subcontractors signing such certifications, to the Illinois Environmental Protection Agency NPDES General Permit No. 2 for "Storm Water Discharge Associated with Industrial Activities" at the identified site. As a co-permittee, I understand that I and my company, are legally required under the Clean Water Act and the Code of Illinois to ensure compliance with the terms and conditions of the SWPPP developed under the NPDES permit and the terms of this NPDES permit.

Signed:_____

Company:_____

Address:_____

Phone #:_____

Date:_____

Signed:_____

Company:_____

Address:_____

Phone #:_____

Date:_____

Signed:_____

Company:_____

Address:_____

Phone #:_____

Date:_____

POLLUTION PREVENTION PLAN PREPARED BY:

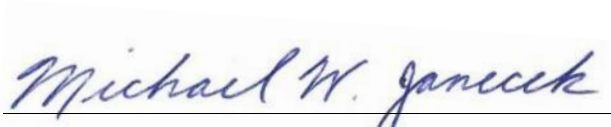
Martin & Whitacre Surveyors & Engineers, Inc.
1508 Bidwell Road
Muscatine, IA 52761
(563) 263-7691

To the best of my knowledge, this plan meets all current minimum mandatory requirements of the IL EPA for SWPPP's in connection with the issuance of an NPDES General Permit #2, as stated in the summary guidance for the permit.

To the best of my knowledge, this plan complies with the minimum mandatory requirements of the joint application form, "Protecting Illinois Waters", for the Illinois Environmental Protection Agency and the U.S. Corp. of Engineers.

To the best of my knowledge, this plan complies with all City of Moline ordinances, Moline Class 2 grading and drainage permit requirements, and all other applicable state or federal permit requirements in existence at the time of application and all requirements of this article.

I hereby certify that this plan, plat, map, survey or report was prepared by me, or under my direct personal supervision, and that I am a duly registered Professional Engineer under the laws of the State of Illinois.



Michael W. Janecek, P.E. IL License No. 062.054284
License Expiration Date November 30, 2025

Martin & Whitacre
Surveyors & Engineers, Inc.

October 3, 2025

Mr. Andy Parer, Stormwater Utility Manager
City of Moline
30 18th Street
Moline, IL 61265

RE: Drainage Summary
Lincoln Irving Building Addition
MW Project # 9122
Moline, IL

Dear Mr. Parer:

This letter is being written to summarize the drainage calculations for the above described project. This project consists of a new 34,305 s.f. school addition with parking lot, sidewalk, and driveway on its multiple lots located north of 16th Avenue, east of 10th Street, south of 14th Avenue, and west of 11th Street in Moline, Illinois. This existing school site previously all drained south to 16th Avenue and will continue to drain storm water in this direction. The storm water will be slowed down by a proposed underground detention system under the proposed parking lot on west side of the property. Detention is required for the property because impervious area is being added as part of the project and the storm sewers on 16th Avenue appear to be undersized to handle the storm water currently draining to it. Detention and storm sewer improvements are being designed in accordance with the requirements of the City of Moline. The drainage requirements in the City Code require the development to control the 2 year, 10 year, and 100 year storms. Due to the fact that the downstream storm sewers are only 12 inch pipes, the improvements are being designed to release at less than the predevelopment 2 year storm rate which is based on the maximum gravity flow allowed by the 12 inch storm sewer at 16th Avenue. The underground detention system has been designed to exceed the requirements of the City to release the post-development 100 year, 10 year, and 2 year flood events at the pre-development flow rates. Intensities used for design are typical to this region. Time of concentration was calculated using TR-55.

The owner of the property is:

Moline Coal Valley School District
1900 52nd Avenue
Moline, IL 61265
309-743-1600

Martin & Whitacre
Surveyors & Engineers, Inc.

The contractor on the project is:

TBD

The engineer on the project is:

Mike Janecek, P.E.
Martin & Whitacre Surveyors & Engineers, Inc.
1508 Bidwell Road
Muscatine, IA 52761
309-314-3600

The existing and proposed conditions were evaluated and it was determined that the total drainage area for the site is approximately 3.55 acres (see attached basin map). The pre-development rational method C factor is 0.63 and the post-development C factor is 0.81. The majority of the proposed impervious area (including the building) will drain to the proposed underground detention system with only the east drop off area not draining to the underground detention system. Detention calculations were performed with post construction assuming storing the 100 year, 10 year, and 2 year post-development conditions and releasing at less than the 2 year pre-development rate using the rational method. The calculations (see attached spreadsheets) resulted in an allowable release rate of 4.08 cfs. is significantly less than allowed by ordinance which is 6.59 cfs. The reason for releasing less than allowed and storing more than required is due to the fact that the existing storm sewers on 16th Avenue are undersized with a maximum size of 12 inches.

Based on the 4.08 cfs release rate, it was determined that 18,146 cf of storage total would be required in the proposed underground detention system at the west side of the site (see attached grading plan and volume summary) and the designed underground detention system contains approximately 20,387 cf of storage up to the emergency overflow elevation. Storage volume calculations have been provided showing storage amounts at 1 inch intervals. Based on our calculations, the 100 year high water level in the basin would be 687.34 feet which is 0.58 feet below the emergency overflow elevation of 687.92 which is the form grade of CB-2 (the inlet southwest of the parking lot). The outlet pipe from the outlet structure with 8.72 inch diameter orifice plate is a proposed 12 inch storm sewer connected to the existing storm sewer system which, as stated above, releases less than the amount allowed by City Code. The flow of undetained area on the southeast corner of the site is insignificant due to the fact that the area is small and the proposed pond is already releasing at least 2.51 cfs less than allowed by City Code. This area has less impervious area than before construction so less storm water will leave this direction after construction as before.

Martin & Whitacre
Surveyors & Engineers, Inc.

The private storm sewer system for the site was designed for the 10 year event using the rational method in accordance with normal engineering practice. The storm sewer drainage calculations are attached to this document. Drainage calculations include storm water resulting from the rooftop of the building that connects to the underground detention system and is detained as well as all paved areas north of the building including the drop off roadway, parking lot, and play areas. The private storm sewers are designed to be 12" through 18" N12 HDPE, A2000 PVC, or approved equal at the slopes and grades shown in the plans and drainage calculations. The proposed storm sewer connects to the existing storm sewer on the north side of 16th Avenue as shown on the plans.

Maintenance of the property will be by the school district. A Notice of Intent will be submitted to the IEPA for the NPDES permit as soon as we have SHPO clearance as required by the permit. Let me know if you have any questions or comments regarding these drainage calculations and summary letter.

Let me know if you have any questions or comments regarding the drainage calculations and summary letter.

Sincerely,

MARTIN & WHITACRE SURVEYORS & ENGINEERS, INC.

Michael W. Janecek

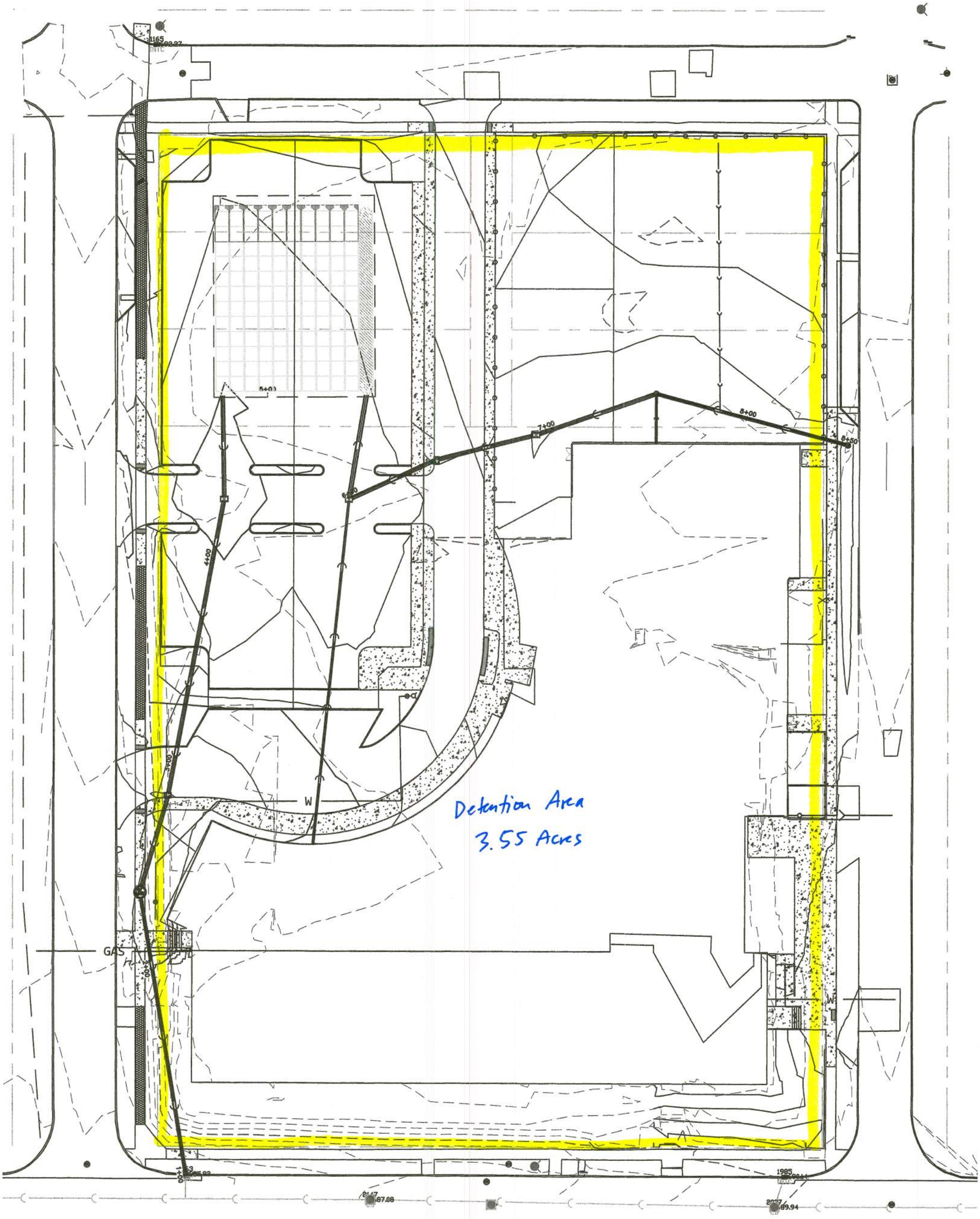
Michael W. Janecek, P.E.
Vice President / Sr. Civil Engineer
mjanecek@martin-whitacre.com

I hereby certify that this drainage report was prepared by me or under my direct personal supervision, and that I am a duly registered professional engineer under the laws of the State of Illinois.

Michael W. Janecek 10-3-25

Michael W. Janecek — Date
IA Reg. #062.054284 — Exp. Date 11/30/25




Detention Area
3.55 Acres
GAS

Stormwater Detention Calculations

Martin & Whitacre Surveyors & Engineers, Inc.

1508 Bidwell Road, Muscatine, IA 52761

Project Name: **Lincoln Irving School Moline, IL** MW Job Number: 9122

Date: 10/3/2025 Design: Mike Janecek

Check:

RUNOFF COEFFICIENT

	A(ex)	A(dev)	C5	C*A(ex)	C100	C*A(dev)
Green Space	1.41	0.64	0.15	0.212	0.15	0.096
Impervious	2.14	2.91	0.95	2.033	0.95	2.765
Rock		0	0.55	0.000	0.55	0.000
Total Area (Ac)=	3.55	3.55	C(ex):	0.63	C(dev):	0.81

RELEASE RATE

Overland Flow (TR-55): Length= 100 ft, Slope= 0.5 %

Shallow Conc. Flow (TR-55): Length= 102 ft, Slope= 0.5 %, Unpaved 102

Stream Flow: Length= 0 ft, Slope= 0 %, X-sect. Area= sf, Mannings 'n'=

Tc(1)= 17.28 min. Tc(2)= 1.5 min. Tc(3)= **0** min.

Total Time of Concentration = 18.78 min.

I2= 2.94 in/hr actual flow rate: 4.08

Q2= 6.59 cfs (existing condition)

STORAGE VOLUME DETERMINATION

T, TIME		*100 YEAR INTENSITY*	*AREA*	*C(dev)*	*Q100*	*Qout*	*Q100-Qout*	*1\12(Qout-Qin)T*
(min.)	*(hour)*	*(in./hr)*	*(Ac.)*		*(cfs)*	*(cfs)*	*(cfs)*	*(AC.FT)*
40	0.667	4.04	3.55	0.81	11.55	4.08	7.47	0.41468
42	0.700	3.92	3.55	0.81	11.21	4.08	7.13	0.41589
44	0.733	3.81	3.55	0.81	10.90	4.08	6.82	0.41651
46	0.767	3.71	3.55	0.81	10.60	4.08	6.52	**0.41658**
48	0.800	3.61	3.55	0.81	10.32	4.08	6.24	0.41616
50	0.833	3.52	3.55	0.81	10.06	4.08	5.98	0.41527
52	0.867	3.43	3.55	0.81	9.81	4.08	5.73	0.41397
54	0.900	3.35	3.55	0.81	9.58	4.08	5.50	0.41227
56	0.933	3.27	3.55	0.81	9.36	4.08	5.28	0.41021
58	0.967	3.20	3.55	0.81	9.14	4.08	5.06	0.40781
60	1.000	3.13	3.55	0.81	8.94	4.08	4.86	0.40510
62	1.033	3.06	3.55	0.81	8.75	4.08	4.67	0.40209
64	1.067	3.00	3.55	0.81	8.57	4.08	4.49	0.39880
66	1.100	2.93	3.55	0.81	8.39	4.08	4.31	0.39525
68	1.133	2.88	3.55	0.81	8.23	4.08	4.15	0.39147
70	1.167	2.82	3.55	0.81	8.07	4.08	3.99	0.38745

REQUIRED STORAGE VOLUME: 0.41658 FT^2*43560 FT^2/Ac.= **18146 *FT^3***

ACTUAL RELEASE RATE (cfs): Allowable = 6.59 Undetained 100 yr Release rate= 0.00

Actual = 6.59

Orifice Sizing:

Q = C*A*sqrt(s*g*h)

Orifice Invert = 683.38

Orifice Diameter = 8.72 in.

Orifice Area = 0.415 sf

Orifice Coefficient (C) = 0.6

Orifice Discharge = 4.08 cfs

Top of Detention Pond = 688.92

Top of Emergency Overflow (H.W.L.)= 687.92

Sized Outlet Pipe:

Top of Emergency Overflow (H.W.L.) = 687.59

Outfall Invert = 682.52

Pipe Size (in.) = 12

Roughness (n) = 0.009

Length (ft.) = 164

Discharge (cfs) = 8.11

Project: LINCOLN IRVING

Chamber Model -	MC-3500	
Units -	Imperial	
Number of Chambers -	124	
Number of End Caps -	22	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	683.66	ft
Amount of Stone Above Chambers -	12	in
Amount of Stone Below Chambers -	9	in
Area of system -	7070	sf Min. Area - 6504 sf min. area

Include Perimeter Stone in Calculations

Click for Stage Area Data

Click to Invert Stage Area Data

Click Here for Metric

StormTech MC-3500 Cumulative Storage Volumes

Height of System (inches)	Incremental Single Chamber (cubic feet)	Incremental Single End Cap (cubic feet)	Incremental Chambers (cubic feet)	Incremental End Cap (cubic feet)	Incremental Stone (cubic feet)	Incremental Ch, EC and Stone (cubic feet)	Cumulative System (cubic feet)	Elevation (feet)
66	0.00	0.00	0.00	0.00	235.66	235.66	23931.10	689.16
65	0.00	0.00	0.00	0.00	235.66	235.66	23695.44	689.08
64	0.00	0.00	0.00	0.00	235.66	235.66	23459.78	688.99
63	0.00	0.00	0.00	0.00	235.66	235.66	23224.11	688.91
62	0.00	0.00	0.00	0.00	235.66	235.66	22988.45	688.83
61	0.00	0.00	0.00	0.00	235.66	235.66	22752.79	688.74
60	0.00	0.00	0.00	0.00	235.66	235.66	22517.13	688.66
59	0.00	0.00	0.00	0.00	235.66	235.66	22281.47	688.58
58	0.00	0.00	0.00	0.00	235.66	235.66	22045.81	688.49
57	0.00	0.00	0.00	0.00	235.66	235.66	21810.15	688.41
56	0.00	0.00	0.00	0.00	235.66	235.66	21574.49	688.33
55	0.00	0.00	0.00	0.00	235.66	235.66	21338.83	688.24
54	0.06	0.00	7.20	0.00	232.78	239.98	21103.17	688.16
53	0.19	0.02	24.07	0.53	225.82	250.42	20863.19	688.08
52	0.29	0.04	36.45	0.83	220.75	258.03	20612.77	687.99
51	0.40	0.05	50.05	1.13	215.19	266.37	20354.74	687.91
50	0.69	0.07	85.21	1.49	200.98	287.68	20088.37	687.83
49	1.03	0.09	127.51	1.94	183.88	313.33	19800.69	687.74
48	1.25	0.11	154.94	2.36	172.74	330.04	19487.36	687.66
47	1.42	0.13	176.36	2.78	164.01	343.14	19157.32	687.58
46	1.57	0.14	195.07	3.18	156.36	354.61	18814.18	687.49
45	1.71	0.16	211.69	3.58	149.55	364.82	18459.57	687.41
44	1.83	0.18	226.73	4.00	143.37	374.10	18094.75	687.33
43	1.94	0.20	240.28	4.41	137.78	382.48	17720.65	687.24
42	2.04	0.22	253.06	4.80	132.52	390.38	17338.17	687.16
41	2.13	0.23	264.70	5.17	127.71	397.58	16947.79	687.08
40	2.22	0.25	275.80	5.51	123.13	404.45	16550.21	686.99
39	2.31	0.27	286.04	5.84	118.91	410.79	16145.76	686.91
38	2.38	0.28	295.71	6.16	114.91	416.78	15734.97	686.83
37	2.46	0.29	304.93	6.47	111.10	422.50	15318.18	686.74
36	2.53	0.31	313.49	6.77	107.55	427.82	14895.69	686.66
35	2.59	0.32	321.62	7.07	104.18	432.87	14467.86	686.58
34	2.66	0.33	329.35	7.36	100.98	437.69	14034.99	686.49
33	2.72	0.35	336.67	7.63	97.94	442.24	13597.30	686.41
32	2.77	0.36	343.64	7.92	95.04	446.60	13155.06	686.33
31	2.82	0.37	350.26	8.19	92.28	450.73	12708.46	686.24
30	2.88	0.38	356.56	8.45	89.66	454.67	12257.73	686.16
29	2.92	0.40	362.59	8.71	87.14	458.44	11803.07	686.08
28	2.97	0.41	368.27	8.97	84.77	462.00	11344.62	685.99
27	3.01	0.42	373.54	9.21	82.56	465.31	10882.62	685.91
26	3.05	0.43	378.60	9.45	80.44	468.49	10417.31	685.83
25	3.09	0.44	383.69	9.69	78.31	471.69	9948.81	685.74
24	3.13	0.45	388.19	9.92	76.42	474.52	9477.12	685.66
23	3.17	0.46	392.54	10.14	74.59	477.27	9002.60	685.58
22	3.20	0.47	396.73	10.35	72.83	479.91	8525.33	685.49
21	3.23	0.48	400.66	10.56	71.17	482.39	8045.42	685.41
20	3.26	0.49	404.41	10.76	69.59	484.77	7563.02	685.33
19	3.29	0.50	407.99	10.96	68.08	487.03	7078.26	685.24
18	3.32	0.51	411.43	11.14	66.63	489.20	6591.23	685.16
17	3.34	0.51	414.67	11.32	65.26	491.25	6102.03	685.08
16	3.37	0.52	417.71	11.49	63.98	493.18	5610.77	684.99
15	3.39	0.53	420.67	11.65	62.73	495.05	5117.59	684.91
14	3.41	0.54	423.40	11.80	61.58	496.79	4622.54	684.83
13	3.44	0.54	426.19	11.95	60.40	498.54	4125.75	684.74
12	3.46	0.55	428.76	12.09	59.32	500.17	3627.21	684.66
11	3.48	0.56	431.36	12.21	58.23	501.80	3127.04	684.58
10	3.51	0.59	434.63	13.09	56.57	504.29	2625.24	684.49
9	0.00	0.00	0.00	0.00	235.66	235.66	2120.95	684.41
8	0.00	0.00	0.00	0.00	235.66	235.66	1885.29	684.33
7	0.00	0.00	0.00	0.00	235.66	235.66	1649.62	684.24
6	0.00	0.00	0.00	0.00	235.66	235.66	1413.96	684.16
5	0.00	0.00	0.00	0.00	235.66	235.66	1178.30	684.08
4	0.00	0.00	0.00	0.00	235.66	235.66	942.64	683.99
3	0.00	0.00	0.00	0.00	235.66	235.66	706.98	683.91
2	0.00	0.00	0.00	0.00	235.66	235.66	471.32	683.83
1	0.00	0.00	0.00	0.00	235.66	235.66	235.66	683.74

User Inputs

Chamber Model:	MC-3500
Outlet Control Structure:	Yes
Project Name:	Lincoln Irving
Engineer:	Mike Janecek
Project Location:	Illinois
Measurement Type:	Imperial
Required Storage Volume:	23000 cubic ft.
Stone Porosity:	40%
Stone Foundation Depth:	9 in.
Stone Above Chambers:	12 in.
Design Constraint Dimensions:	(100 ft. x 97 ft.)

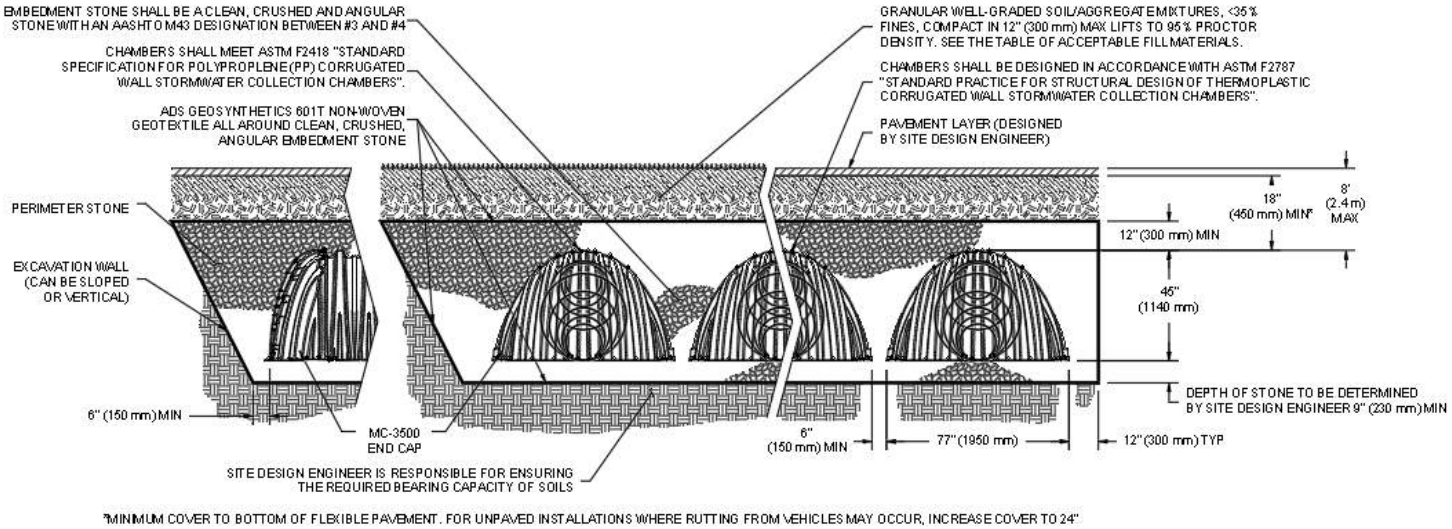
Results

System Volume and Bed Size

Installed Storage Volume:	23931.10 cubic ft.
Storage Volume Per Chamber:	109.90 cubic ft.
Number Of Chambers Required:	124
Number Of End Caps Required:	22
Chamber Rows:	11
Maximum Length:	96.24 ft.
Maximum Width:	77.58 ft.
Approx. Bed Size Required:	7069.82 square ft.
Average Cover Over Chambers:	1.84 ft.

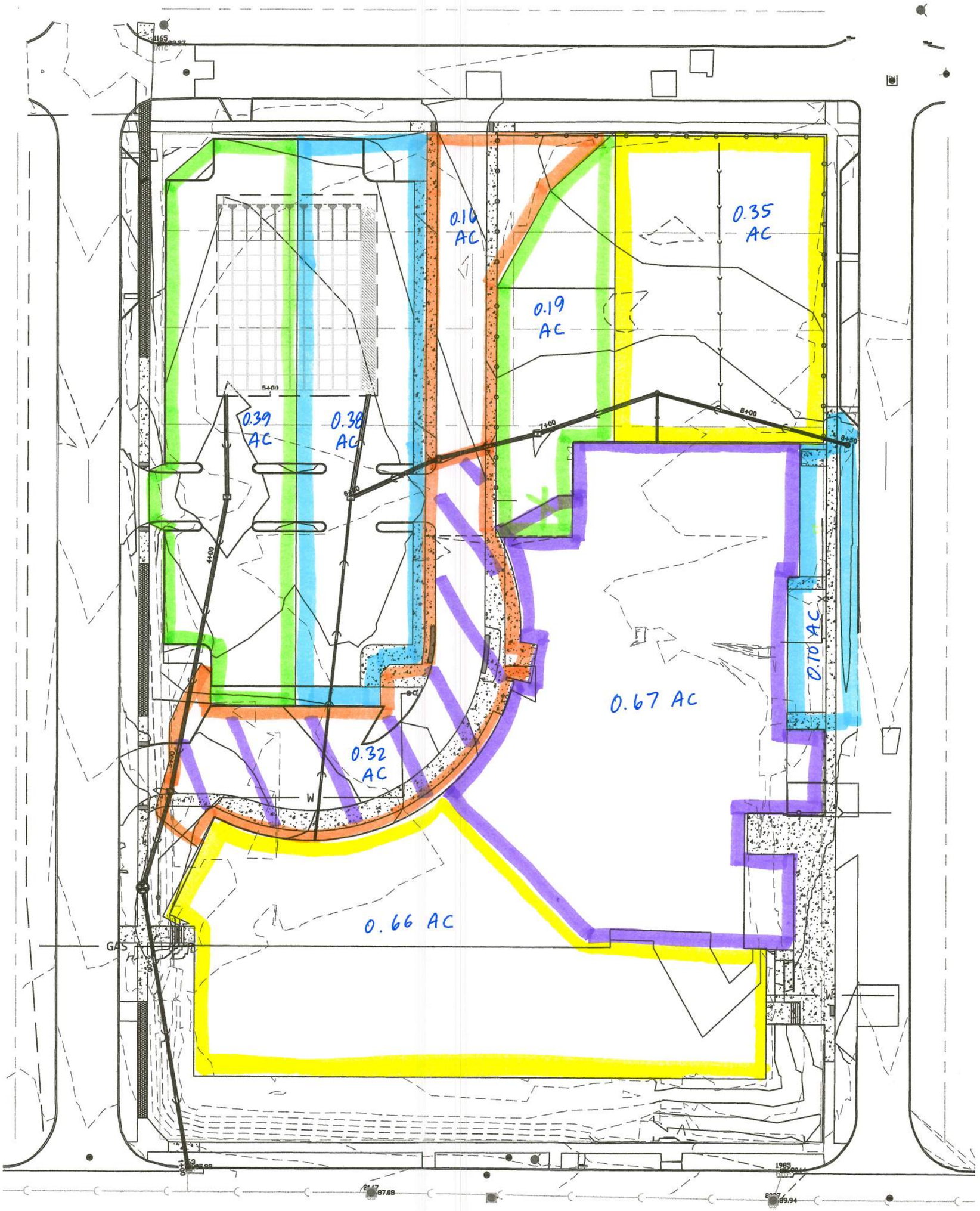
System Components

Amount Of Stone Required:	924 cubic yards
Volume Of Excavation (Not Including Fill):	1441 cubic yards
Total Non-woven Geotextile Required:	2141 square yards
Woven Geotextile Required (excluding Isolator Row):	292 square yards
Woven Geotextile Required (Isolator Row):	105 square yards
Total Woven Geotextile Required:	397 square yards
Impervious Liner Required:	0 square yards



Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
detention							
SHEET	100	0.0050	0.150				0.288
SHALLOW	102	0.0050	0.050				0.025
					Time of Concentration		.313



Storm Sewer Drainage Basins

JOB NAME: Lincoln Irving

DATE: 10/3/2025 FILE: ODI1 TO DET

DESIGN ANALYSIS
STORM SEWER COMPUTATION SHEET

JOB NUMBER: 9,122

RETURN PERIOD =	10	YRS (USE 2,5,10,25,0R 50)
MANNING'S n =	0.013	
Upstream Starting Inv.	688.91	

STATION FROM	STATION TO	LENGTH feet	DRAINAGE AREA acres incr.	DRAINAGE AREA acres total	C incr.	C comp.	Tc min upper end	Tc min in section	I in/hr	Q cfs	DIA in	SLOPE %	Qfull cfs	Vfull fps between 2-13	V design fps	HGL Slope ft/ft	DOWN-STREAM Head loss in pipe ft	DOWN-STREAM MH pipe drop ft	Depth of flow ft	Q - Qf CAP = + DEF = - cfs	DOWNSTREAM MH IN INVERT	DOWNSTREAM MH OUT INVERT
ODI2	ODI1	95	0.1	0.1	0.4	0.40	14.95	0.93	5.224	0.21	12	0.50	2.52	3.21	1.70	0.01	0.48	0.00	0.19	2.31	688.44	688.44
ODI1	AI-1	61	1.02	1.12	0.77	0.74	15.42	0.14	5	4.13	15	1.95	9.02	7.35	7.04	0.02	1.19	0.00	0.59	4.89	687.25	687.25
AI-1	CB1	50	0.19	1.31	0.95	0.77	15.56	0.11	5	5.03	15	1.95	9.02	7.35	7.51	0.02	0.98	0.00	0.66	3.99	686.27	686.27
CB1	VGRATE1	45	0.16	1.47	0.95	0.79	15.68	0.10	5	5.79	15	1.95	9.02	7.35	7.70	0.02	0.88	0.00	0.72	3.23	685.39	685.39
VGRATE1	DET	51	1.04	2.51	0.9	0.83	15.77	0.09	5	10.47	18	2.20	15.58	8.82	9.45	0.02	1.12	0.00	0.90	5.11	684.27	#N/A

JOB NAME: Lincoln Irving

DATE: 10/3/2025 FILE: DET to CBEX

DESIGN ANALYSIS
STORM SEWER COMPUTATION SHEET

JOB NUMBER: 9,122

RETURN PERIOD =	10	YRS (USE 2,5,10,25,0R 50)
MANNING'S n =	0.009	
Upstream Starting Inv.	684.07	

STATION FROM	STATION TO	LENGTH feet	DRAINAGE AREA acres incr.	DRAINAGE AREA acres total	C incr.	C comp.	Tc min upper end	Tc min in section	I in/hr	Q cfs	DIA in	SLOPE %	Qfull cfs	Vfull fps	V design fps	HGL Slope ft/ft	DOWN-STREAM MH Head loss in pipe ft	DOWN-STREAM MH pipe drop ft	Depth of flow ft	Q - Qf CAP = + DEF = - cfs	DOWNSTREAM MH IN INVERT	DOWNSTREAM MH OUT INVERT
														between 2-13								
DET	VGRATE2	50	2.51	2.51	0.8	0.80	48.00	0.19	2.676	4.08	15	0.25	4.67	3.80	4.33	0.00	0.13	0.00	0.90	0.59	683.95	683.95
VGRATE2	CB2	145	0.39	2.9	0.85	0.81	48.19	0.52	2.676	4.08	15	0.30	5.11	4.16	4.66	0.00	0.44	0.00	0.82	1.03	683.51	683.51
CB2	STDET	47	0.32	3.22	0.95	0.82	48.71	0.17	2.676	4.08	15	0.30	5.11	4.16	4.66	0.00	0.14	0.00	0.82	1.03	683.37	683.37
STDET	CBEX	137	0	3.22	0.95	0.82	48.88	0.38	2.676	4.08	12	0.63	4.08	5.20	6.00	0.01	0.86	0.00	0.81	0.00	682.51	#N/A

Moline
Lincoln Irving
Rock Island County, Illinois

Sub-Area Time of Concentration Details

Sub-Area Identifier/	Flow Length (ft)	Slope (ft/ft)	Mannings's n	End Area (sq ft)	Wetted Perimeter (ft)	Velocity (ft/sec)	Travel Time (hr)
odi1							
SHEET	100	0.0070	0.150				0.252
SHALLOW	47	0.0280	0.050				0.005
					Time of Concentration		.257

United States Department of Agriculture

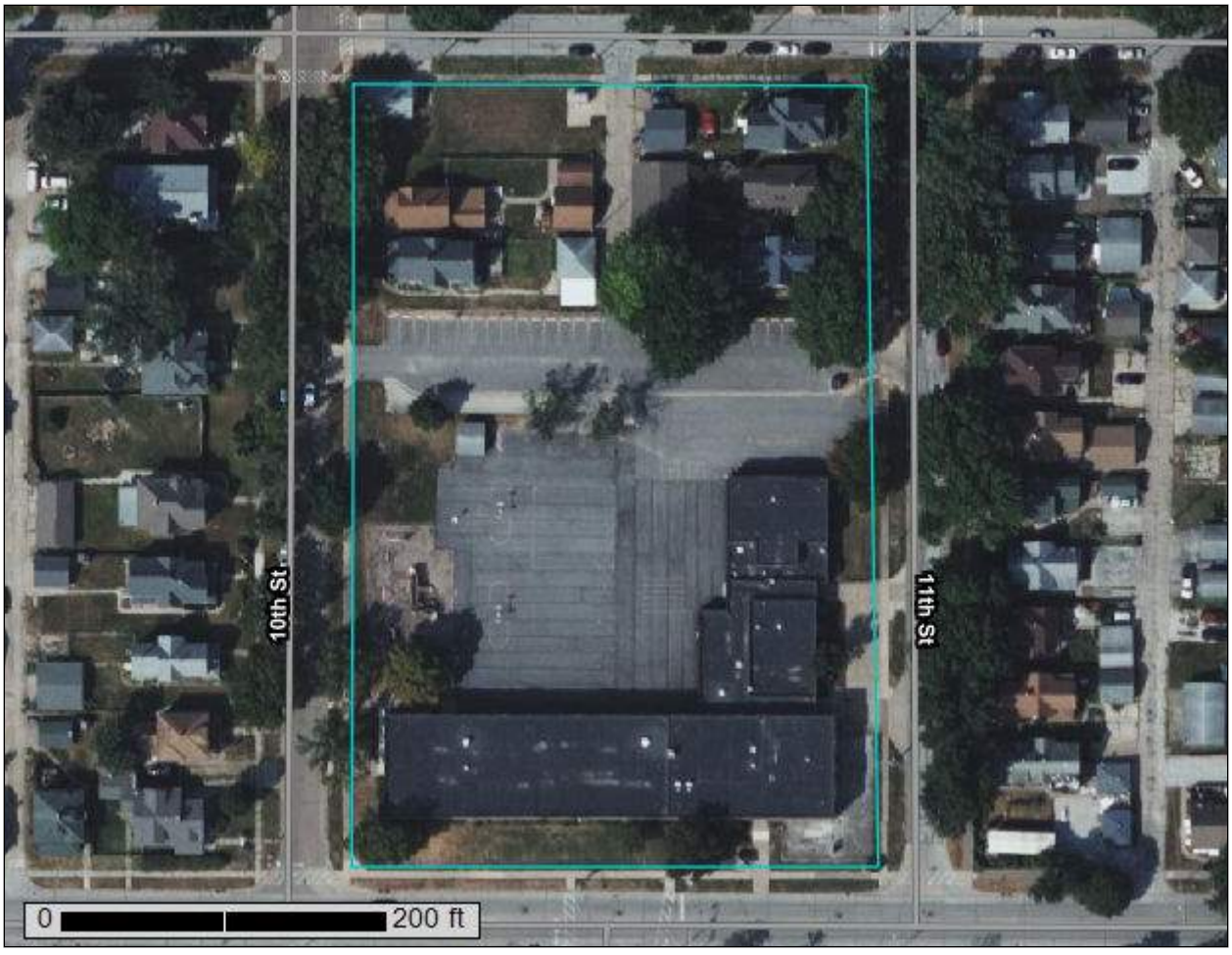
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Rock Island County, Illinois

Lincoln Irving School



October 3, 2025

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

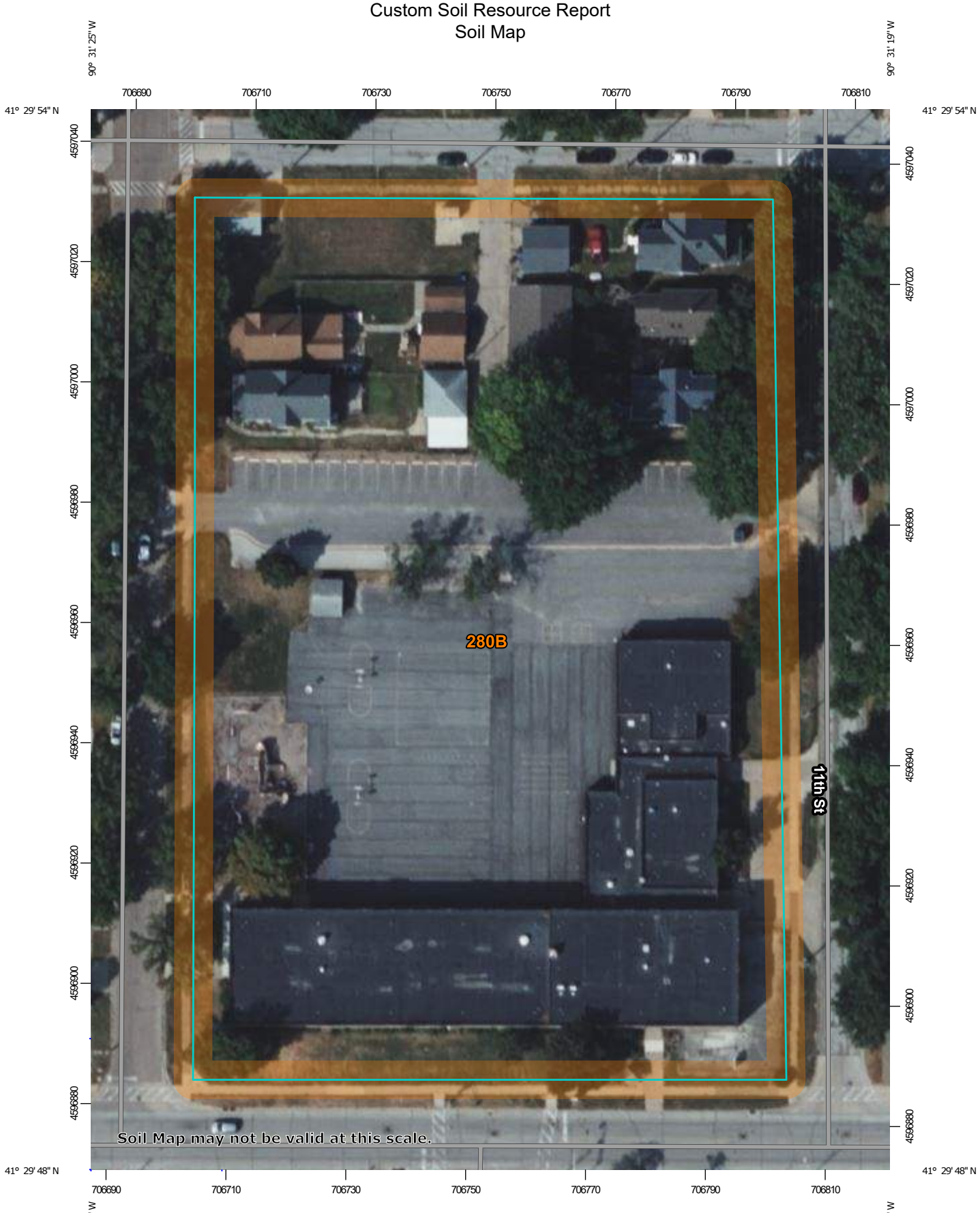
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:859 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 10 20 40 60

Feet
0 40 80 160 240

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rock Island County, Illinois
Survey Area Data: Version 21, Aug 31, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 17, 2020—Sep 15, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
280B	Fayette silt loam, glaciated, 2 to 5 percent slopes	3.5	100.0%
Totals for Area of Interest		**3.5**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Rock Island County, Illinois

280B—Fayette silt loam, glaciated, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2w6rp
Elevation: 450 to 990 feet
Mean annual precipitation: 32 to 40 inches
Mean annual air temperature: 47 to 55 degrees F
Frost-free period: 150 to 185 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Fayette and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fayette

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Interfluve, head slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess

Typical profile

Ap - 0 to 7 inches: silt loam
E - 7 to 11 inches: silt loam
Bt1 - 11 to 45 inches: silty clay loam
Bt2 - 45 to 55 inches: silt loam
C - 55 to 60 inches: silt loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F115XC005IL - Loess Upland Forest
Hydric soil rating: No

Minor Components

Keomah

Percent of map unit: 5 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F115XC005IL - Loess Upland Forest
Hydric soil rating: No

Atterberry

Percent of map unit: 3 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F095XB005WI - Moist Loamy or Clayey Lowland
Hydric soil rating: No

Edgington

Percent of map unit: 2 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: F095XB004WI - Wet Loamy or Clayey Lowland
Hydric soil rating: Yes

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PERIODIC INSPECTION, OPERATION & MAINTENANCE RECORDS

(Project Name): _____ Pond # ____

Date	Time	Rain "	Weather Conditions	General Observations or Comments	Recorded By
Date	Maintenance Performed			Comments	Recorded By
Date	Equipment Operated			Comments	Recorded By

SECTION 00 41 00
BID FORM

PROJECT: MOLINE - COAL VALLEY SCHOOL DISTRICT
LINCOLN IRVING ADDITION AND RENOVATIONS

BID FROM:

ADDRESS: _____

_____

PHONE: _____

EMAIL: _____

(Bidder's Information)

NOTE: Submit two copies of this Bid Form. All blanks shall be completed. Only bids on this form will be accepted. Submit Bid Security in separate envelope.

1. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an agreement with Owner in the form included in the Contract Documents to perform and furnish all Work as specified or indicated in the Contract Documents for the Bid Price and within the schedule indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents. Bidder accepts all of the terms and conditions of the Request for Bids and Instructions to Bidders, including without limitation those dealing with the disposition of bid security. This Bid will remain subject to acceptance for 60 days after the day of bid opening.

2. The undersigned Bidder submits, herewith, bid security in accordance with the terms set forth in the Request for Bids.

3. Bidder has examined and carefully studied the Bid Documents and the following Addenda, receipt of all which is hereby acknowledged:

Date	Number

4. Bidder has visited the site and become familiar with and is satisfied as to the general, local and site conditions that may affect cost, progress, performance and furnishing of the Work.

5. Bidder is familiar with and is satisfied as to all federal, state and local laws and regulations that may affect cost, progress, performance and furnishing of the Work.

6. Base Bid - Bidder will complete the Work in accordance with the Contract Documents for the following prices, and includes 100% Performance and Payment Bond in bid.

Bid Package_____-_____

$_____. _____(Write in numbers)

_____

_____Dollars. (Write in words)

7. Alternates:

1. Provide artificial turf at grass play area. Includes concrete curb at perimeter.

   Add $_____ /lump sum

2. Provide pourable playground surface instead of wood mulch.

   Add $_____ /lump sum

3. Provide off street parking at North End of 11th Street and North end of 10th Street. as designated on drawings. This includes traffic control, demolition, and new paving and sidewalks per City of Moline standards.

   Add $_____/lump sum

4. Provide security film at glass at interior wall between Cafeteria 117 and Corridor C001. All other security film included in base bid.

   Add $_____/lump sum

5. Provide twenty-four natural boulders as shown along the front curve as indicated on the drawings.

   ADD $_____/lump sum

8. Unit Prices

(a) Excavate/haul spoils off-site/backfill unsuitable soils with compacted rock $_____/cuyd

(b) Excavate/haul spoils off-site/backfill unsuitable soils with flowable fill $_____/cuyd

(c) Provide additional 7’-0” helical pile extensions in excess of base bid $_____/each

9. Complete and submit all supplemental Certifications Schedules A thru I per section 00 45 50 and submit with bid form.

10. Subcontractors and Suppliers - Bidder shall provide list within 24 hours of bid opening.

11. BIDDER agrees that the Work will be completed in accordance with the project schedule in the Bid Documents.

12. This Bid submitted on_____, 20_____.

13. Complete the applicable item(s) listed below. If this Bid is submitted by an agent of BIDDER, attach a current Power-of-Attorney certifying the agent's authority to bind the BIDDER.

If BIDDER is:

An Individual

By: _____
(Signature of individual) *(Typed or printed name)*

doing business as: _____

Business Address: _____

_____

Phone No. _____

A Partnership

By: _____
(Firm Name)

_____ _____
(Signature of general partner) *(Typed or printed name)*

Business Address: _____

_____

Phone No. _____

A Corporation

By: _____
(Corporation Name)

_____
(State of Incorporation)

By: _____
(Signature of person authorized to sign)

_____
(Typed or printed name and title)

Attest: _____

(Secretary)

Business Address: _____

_____

Phone No. _____

END OF SECTION

Assurance Schedule A
Vendor Information Form

VENDOR INFORMATION FORM

Name of Company: _____

Tax Payer ID #: _____ FCC/USAC "SPIN" Number:_____

Address: _____ Date Business Began:_____

_____

Telephone No: _____ Years at Location:_____

List of contact information for all officers, directors, and principals:

Name: _____
Title: _____
Address: _____
Telephone No: _____
Relationship: _____

Description of services provided:

Description of facilities/resources:

Description of staff (no./type/qualifications, etc.):

Brief history of company:

Client reference list of major customers and projects (include address and telephone number):

Verified by: _____
Date Verified: _____

Assurance Schedule B
Civil Rights Certification of Compliance

CERTIFICATE OF COMPLIANCE
WITH ILLINOIS HUMAN RIGHTS ACT

All successful contractors must comply with the provisions of the Illinois Human Rights Act (ACT) dealing with equal employment opportunities (Section 2-105, 775 ILCS 5/2-105) including equality of employment opportunity and the regulations of the Department of Human Rights of the State of Illinois and also must provide for the adoption and implementation of written Sexual Harassment Policies. The contract with the successful bidder will provide for this requirement. The statutory provisions require that the written Sexual Harassment policy included at a minimum the following information: (i) the illegality of sexual harassment; (ii) the definition of sexual harassment under Illinois law; (iii) a description of sexual harassment, utilizing examples; (iv) a vendor's internal complaint process including penalty; (v) the legal recourse, investigative and complaint process available through the Department of Human Rights Commission; (vi) directions on how to contact the Department of Commission; and (vii) protection against retaliation as provided by Section 6-101 of the Illinois Human Rights Act.

Firm Name_____

Address_____

Signature of Officer

_____

Title

_____

Subscribed and sworn to before me
this _____ day of _____, 20___.

Notary Public

_____

Assurance Schedule C
Vendor Eligibility Certification

BIDDING AND CONTRACT REQUIREMENTS
Vendor Eligibility Certification

Public Act 85-1295 (Illinois Revised Status, 1987, Ch 38, art 33E) requires that all contractors bidding for public agencies in the State of Illinois certify that they are not barred from bidding on public contracts for bid-rigging or bid rotation.

The following certifications must be signed and submitted with bidder's bid proposal. *FAILURE TO DO SO WILL RESULT IN DISQUALIFICATION OF THE BIDDER*.

_____. As part of its bid on contract for
(*Name of Contractor)*

_____. For Moline School
(*Name of Bid Package)*

District No. 40 hereby certifies that said contractor is not barred from bidding on the aforementioned contract as a result of a violation of either Section 33E-3 or 33E-4 of Article 33E of Chapter 38 of the Illinois Revised Statutes.

Firm Name: _____

By: _____

Title: _____

Subscribed and sworn to before me
this _____ day of _____, 20___.

Notary Public

_____

Verified by: _____
Date Verified: _____

Assurance Schedule D
Drug Free WorkPlace

CERTIFICATIONS OF COMPLIANCE WITH ILLINOIS DRUG FREE WORKPLACE ACT

The undersigned, having 25 or more employees, does hereby certify pursuant to section 3 of the Illinois Drug-Free Workplace Act (30 ILCS 580/3) that it shall provide a drug-free workplace for all employees engaged in the performance of work under the contract by complying with the requirements of the Illinois Drug-Free Workplace Act and, further certifies, that it is not ineligible for award of this contract by reason of debarment for violation of the Illinois Drug-Free Workplace Act.

_____ _____

Name of bidder (Please Print) Submitted by (Signature)

_____

Title

Assurance Schedule E
Non-Collusion Affidavit

BIDDING AND CONTRACT REQUIREMENTS
Non-Collusion Affidavit

AFFIDAVIT: "I, (we) hereby certify and affirm that my (our) proposal was prepared independently for this bid package and that it contains no fees or amounts other than for the legitimate execution of this work as specified and that it includes no understanding or agreements in restraint of trade. I further certify that I (we) am not barred from bidding on the contract as a result of a conviction for either bid-rigging or bid rotating under Article 33E of the Criminal Code of 1961."

The following certification must be signed and submitted with bidder's proposal. *FAILURE TO DO SO WILL RESULT IN DISQUALIFICATION OF THE BIDDER.*

(If an individual)
Signature of Proposer:_____
(Seal) *(Signature required)*

Business Address: _____

(If a Partnership)
Firm Name: _____
(Seal)
By _ _____
(Signature required)

Business Address: _____
(of all Partners of the Firm)

(If a Corporation)
Corporate Name: _____

By _____
(Signature required)

Corporate Address: _____

(CORPORATE SEAL)
Names of Officers: (President): _____

(Secretary): _____

(Treasurer): _____

Attest: (Secretary): _____

Assurance Schedule F
Federal Tax ID and Disclosure

Under penalties of perjury, I certify that _____is my correct Federal Taxpayer Identification Number. I am doing business as a (please check one):

_____Individual

_____Sole Proprietorship

_____Partnership

_____Corporation

_____Governmental Entity

_____Not-for-profit Corporation

_____ _____
Signature Date

Return this certification to:

Moline-Coal Valley CUSD 40
Attention: Business Office
1619 11th Avenue
Moline, Illinois 61265

Assurance Schedule G
Certification Regarding Debarment

Instructions for Certification

1. By signing and submitting this Certification, the prospective lower tier participant is providing the certifications set out herein.
2. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal government, the department or agency with which this transaction originated may pursue all available remedies, including suspension and/or debarment.
3. Except for transactions authorized under paragraph 3 above, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal government, the department or agency with which this transaction originated may pursue all available remedies, including suspension and/or debarment.
4. The terms covered transaction, debarred, suspended, ineligible, lower tier covered transaction, participant, person, primary covered transaction, principal, proposal, and voluntarily excluded, as used herein, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549 and Executive Order 12689. You may contact the person to which this Certification is submitted for assistance in obtaining a copy of those regulations.
5. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier Covered transaction that it is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the "GSA Excluded Parties List System" at http://epls.arnet.gov/.
6. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required herein. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion Lower Tier Covered Transactions

This certification is required by the regulations implementing Executive Orders 12549 and 12689, Debarment and Suspension, 7 CFR 3017 Subpart C Responsibilities of Participants Regarding Transactions. The regulations were published as Part IV of the January 30, 1989 Federal Register (pages 4722-4733) and Part II of the November 26, 2003 Federal Register (pages 66533-66646). Copies of the regulations may be obtained by contacting the Illinois State Board of Education.

BEFORE COMPLETING CERTIFICATION, READ INSTRUCTIONS BELOW.

CERTIFICATION

The prospective lower tier participant certifies, by submission of this Certification, that:
(1) Neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency;
(2) It will provide immediate written notice to whom this Certification is submitted if at any time the prospective lower tier participant learns its certification was erroneous when submitted or has become erroneous by reason of changed circumstances;
(3) It shall not knowingly enter any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated;
(4) It will include the clause titled Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion—Lower Tier Covered Transactions, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions;
(5) The certifications herein are a material representation of fact upon which reliance was placed when this transaction was entered into; and
(6) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this Certification.

Organization Name: _____

Name Authorized Representative: _____

Title of Authorized Representative: _____

Signature: _____

Signature Date: _____

Assurance Schedule H
Notification of Lobbying Activity

NOTICE TO APPLICANTS – CERTIFICATION/DISCLOSURE REQUIREMENTS RELATED TO LOBBYING

Section 319 of Public Law 101-121 (31 U.S.C.), signed into law on October 23, 1989, imposes new prohibitions and requirements for disclosure and certification related to lobbying on recipients of Federal contracts, grants, cooperative agreements, and loans. Certain provisions of the law also apply to Federal commitments for loan guarantees and insurance; however, it provides exemptions for Indian tribes and tribal organizations.

Effective December 23, 1989, current and prospective recipients (and their subtier contractors and/or subgrantees) will be prohibited from using Federal funds, other than profits from a Federal contract, for lobbying Congress or any Federal agency in connection with the award of a particular contract, grant, cooperative agreement or loan. In addition, for each award action in excess of $100,000 (or $150,000 for loans) on or after December 23, 1989, the law requires recipients and their subtier contractors and/or subgrantees to: (1) certify that they have neither used nor will use any appropriated funds for payment to lobbyists; (2) disclose the name, address, payment details, and purpose of any agreements with lobbyists whom recipients or their subtier contractors or subgrantees will pay with profits or **nonappropriated** funds on or after December 23, 1989; and (3) file quarterly updates about the use of lobbyists if materials changes occur in their use. The law establishes civil penalties for noncompliance.

If you are a current recipient of funding or have an application, proposal, or bid pending as of December 23, 1989, the law will have the following immediate consequences for you:

- You are prohibited from using appropriated funds (other than profits from Federal contracts) on or after December 23, 1989, for lobbying Congress or any Federal agency in connection with a particular contract, grant, cooperative agreement, or loan;

- you are required to execute the attached certification at the time of submission of an application or before any action in excess of $100,000 is awarded; and

- you will be required to complete the lobbying disclosure form if the disclosure requirements apply to you.

Regulations Implementing Section 319 of Public Law 101-121 have been published as an Interim Final Rule by the Office of Management and Budget as Part III of the February 26, 1990, **Federal Register** (pages 6736-6746).

(Continued on the next page)

CERTIFICATION REGARDING LOBBYING – CONTRACTS, GRANTS, LOANS AND COOPERATIVE AGREEMENTS

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal amendment, or modification of any Federal contract, grant, loan or cooperative agreement;

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions;

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

Organization Name | Award Number or Project Name

Name and Title of Authorized Representative

Signature | Date

Assurance Schedule I

ACORD®

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:	
	PHONE (A/C, No, Ext):	FAX (A/C, No):
	E-MAIL ADDRESS:	
	INSURER(S) AFFORDING COVERAGE	NAIC #
INSURED	INSURER A :	
	INSURER B :	
	INSURER C :	
	INSURER D :	
	INSURER E :	
	INSURER F :	

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
	COMMERCIAL GENERAL LIABILITY						EACH OCCURRENCE	$ 1,000,000
	[ ] CLAIMS-MADE [X] OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 50,000
							MED EXP (Any one person)	$ 5,000
							PERSONAL & ADV INJURY	$ 1,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$ 1,000,000
	[ ] POLICY [ ] PRO-JECT [ ] LOC						PRODUCTS - COMP/OP AGG	$ 1,000,000
	[ ] OTHER:							$
	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident)	$ 1,000,000
	[X] ANY AUTO						BODILY INJURY (Per person)	$
	[ ] OWNED AUTOS ONLY [ ] SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	[ ] HIRED AUTOS ONLY [ ] NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	$
								$
	UMBRELLA LIAB [X] OCCUR						EACH OCCURRENCE	$ 5,000,000
	EXCESS LIAB [ ] CLAIMS-MADE						AGGREGATE	$ 5,000,000
	[ ] DED [X] RETENTION $							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N						[X] PER STATUTE [ ] OTH-ER	
	ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? [ ] **(Mandatory in NH)**	N / A					E.L. EACH ACCIDENT	$ 100,000
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$ 100,000
							E.L. DISEASE - POLICY LIMIT	$ 500,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Certificate Holder named as Additional Insured, as their interest may appear.

CERTIFICATE HOLDER

Moline-Coal Valley CUSD 40
ATTN: Dave McDermott
1619 11th Avenue
Moline, IL 61265

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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SECTION 00 43 25
SUBSTITUTION REQUEST FORM - DURING PROCUREMENT

TO: LEGAT ARCHITECTS

PROJECT: LINCOLN-IRVING ADDITION AND RENOVATION

WE HEREBY SUBMIT FOR YOUR CONSIDERATION THE FOLLOWING PRODUCT INSTEAD OF THE SPECIFIED ITEM FOR THE ABOVE

SECTION - PARAGRAPH - SPECIFIED ITEM

_____

PROPOSED SUBSTITUTION: _____

ATTACH COMPLETE TECHNICAL DATA INCLUDING LABORATORY TESTS IF APPLICABLE. INCLUDE COMPLETE INFORMATION CHANGES TO DRAWINGS AND/OR SPECIFICATIONS WHICH PROPOSED SUBSTITUTION REQUIRES FOR PROPER INSTALLATION.

FILL IN BLANKS BELOW, USE ADDITIONAL SHEETS IF NECESSARY:

A. DOES THE SUBSTITUTION AFFECT DIMENSIONS SHOWN ON DRAWINGS?

_____

B. WILL THE UNDERSIGNED PAY FOR CHANGES TO BUILDING DESIGN, INCLUDING ENGINEERING AND DETAILING COSTS CAUSED BY SUBSTITUTION, IF ANY?

_____

C. WHAT EFFECT DOES SUBSTITUTION HAVE ON OTHER TRADES?

_____

D. IDENTIFY ANY DIFFERENCES BETWEEN PROPOSED SUBSTITUTION AND SPECIFIED ITEM.

_____

E. IDENTIFY ANY DIFFERENCES BETWEEN MANUFACTURER'S GUARANTEES ON SUBSTITUTION AND SPECIFIED ITEM.

_____

PROVIDE ADDITIONAL PAGES FOR EXPLANATION IF SPACE PROVIDED IS INSUFFICIENT.

THE UNDERSIGNED STATES THAT THE FUNCTION, APPEARANCE, AND QUALITY ARE EQUIVALENT OR SUPERIOR TO THE SPECIFIED ITEM.

SUBMITTED BY:

_____

SIGNATURE:

_____

FIRM: _____

ADDRESS: _____

_____

_____

TELEPHONE: _____

FOR USE BY DESIGN CONSULTANT

ACCEPTED **ACCEPTED AS NOTED**

NOT ACCEPTED **RECEIVED TOO LATE**

BY: _____

DATE: _____

REMARKS: _____

_____

END OF SECTION 00 43 25

SECTION 00 52 00
AGREEEMENT FORM

SEE FOLLOWING SAMPLE SUBCONTRACT FORM

STANDARD SUBCONTRACT REQUIREMENTS

Subcontract	➢If a Subcontract is issued, it will be sent via DocuSign for signature (you do not need a DocuSign account to access an Estes contract). ➢A link to the fully executed document will be provided by DocuSign. ➢Only documents signed using DocuSign e-signature for verification will be accepted as valid.
W9 Request for Taxpayer ID	➢May be required for set up in our Accounting System or for updating to current information. ➢If applicable, request will be sent via DocuSign.
Insurance	➢Proof of insurance is required before you begin on-site work ➢Documentation will be requested by ***Jones***, our partner in managing insurance submissions ➢EXHIBIT B details the minimum insurance requirements for Estes standard subcontracts and is included for your consideration in the process of estimating project costs.
Pay Application	➢Applications for payment must be submitted on current edition of AIA Application for Payment or AIA equivalent.
Tax Exempt Status	➢Project is tax exempt ➢Method of Tax Exempt Certificate delivery will be provided when project has been awarded.

SUBCONTRACT AGREEMENT

EFFECTIVE DATE:
SUBCONTRACT SUM: $

PROJECT NUMBER / JOB COST
PROJECT NAME:
PROJECT ADDRESS:
PROJECT OWNER:
PROJECT ARCHITECT / ENGINEER:
ESTES PROJECT MANAGER:
OFFICE: CELL:
EMAIL:

SIGNED SUBCONTRACT and proof of insurance must be provided within 10 days of the Effective Date AND PRIOR to the date you arrive on-site to begin work. Subcontractor shall have no right to access the Project site or to commence the Subcontractor Work (nor shall Subcontractor be entitled to payment for the Subcontractor Work and Contractor may withhold payment to Subcontractor) until this Subcontract is signed by the Parties and Subcontractor has delivered to the Contractor all deliverables required by this Subcontract, including proof of insurance, or otherwise requested by the Contractor, unless noted in the Special Payment Terms or Special Terms sections of this Agreement.

SUBCONTRACTOR:
ADDRESS:
CITY/STATE/ZIP:
TELEPHONE NUMBER:

This Subcontract Agreement (this or the "Agreement") is between ESTES CONSTRUCTION, herein called "Contractor" or "Estes" or "Estes Construction", and the above-referenced subcontractor, herein called "Subcontractor", and is effective as of the above Effective Date. Contractor and Subcontractor are each a "Party" and together, the "Parties".

RECITALS:

WHEREAS, Contractor and the above-referenced Project Owner ("Owner") executed the Prime Contract (defined below); and

WHEREAS, Contractor desires to subcontract a portion of the Contractor's services arising under the Prime Contract (the "Contractor's Work") to Subcontractor, and Subcontractor desires to accept such subcontract, all subject to the terms and conditions of this Subcontract.

NOW, THEREFOR, in consideration of the mutual covenants, terms, and conditions set forth herein, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties agree as follows:

1. SUBCONTRACT DOCUMENTS

1.1 The "Subcontract Documents" consist of (1) this Agreement, including any Exhibit or attachments attached hereto and hereby incorporated by this reference, as each may be amended from time to time by the Parties; (2) the Estes Company LLC General Terms and Conditions attached hereto (the "Estes General Conditions" and, together with the Agreement, this or the "Subcontract"); (3) the agreement between Owner and Contractor and related to the Project and Contractor's Work with respect to the same, together with the other Contract Documents enumerated therein, including Conditions of the Contract (General, Supplementary and other Conditions, Drawings, Specifications, Addenda between Contractor and Owner and issued prior to execution of this Subcontract (collectively, the "Prime Contract"), which Prime Contract is

SAMPLE

expressly incorporated herein, as applicable to the Subcontractor Work, provided, that, Subcontractor shall not control any of the Contractor's Work or otherwise administer the Prime Contract, such duties hereby reserved by Contractor.

1.2 To the extent of a direct conflict between this Agreement and the Estes General Conditions, this Agreement shall control. To the extent of a direct conflict between this Subcontract and the Prime Contract, the terms of this Subcontract shall control. Otherwise, with respect to the Subcontractor Work (defined below), the Subcontract Documents are intended to supplement each other. The enumeration of items in one Subcontract Document, but not another shall not be construed to exclude other items. Except as otherwise expressly provided in this Subcontract, in the case of a direct conflict in the Subcontract Documents, the stricter interpretation shall prevail.

1.3 It is agreed that the Supplemental Terms and Conditions shall take precedence over any conflicts or ambiguity with the Estes General Terms and Conditions.

2. THE WORK OF THIS SUBCONTRACT

Scope of Work: Subcontractor shall complete all construction work and, if applicable, design services as described in ***Exhibit A*** attached hereto (as described, the "Subcontractor Work"). All Subcontractor Work shall be completed in accordance with the Subcontract Documents, as may be amended from time to time, and, in furtherance thereof, Subcontractor shall assume toward Contractor all obligations and responsibilities that Contractor has under the Prime Contract to Owner with respect to the Subcontractor Work. In addition to other remedies provided in this Subcontract, at law, or in equity, Contractor shall have the same rights and remedies against Subcontractor that Owner has against Contractor under the Prime Contract with respect to the Subcontractor Work.

Items of the Subcontractor Work are listed for the purpose of clarifying their inclusion in this Subcontract, as they, for various reasons, may not have been included in the plans or technical specifications relating directly to the Subcontractor Work. Likewise, they may have been included in the specifications but excluded by the Subcontractor in its bid. Also, items may be listed for emphasis as they may already be included in the specifications and plans but are sometimes unclear as to whether they are included by the Subcontractor and are therefore being listed for clarifications. In no way is this list to be representative of all work to be done by the Subcontractor, but rather is for the purposes of illustration and of clarifying certain items only.

Please Note: Subcontractor shall have no right to access the Project site or to commence the Subcontractor Work (nor shall Subcontractor be entitled to payment for the Subcontractor Work and Contractor may withhold payment to Subcontractor) until this Subcontract is signed by the Parties and Subcontractor has delivered to the Contractor all deliverables required by this Subcontract, including proof of insurance, or otherwise requested by the Contractor.

3. PAYMENTS; RETAINAGE

For the Subcontractor Work, and subject to the terms of the Subcontract Documents, Contractor shall pay Subcontractor the below-referenced sum (the "Subcontract Sum").

SUBCONTRACT SUM: $

☐ GMP CONTRACT: **Unused portions of the value of the GMP returned to Owner via Subcontract Change Order through Estes.**

APPLICATIONS FOR PAYMENT:
☒ Submit for payment to Contractor monthly, on or before day

Sales Tax: This Project… ☐ Includes Tax ☒ is Tax Exempt* ☐ Estes Pays State Tax

☐ **Performance & Payment Bond:** If checked, the above **SUBCONTRACT SUM** includes Subcontractor's cost to obtain the required Performance & Payment Bond.

SPECIAL PAYMENT TERMS, if any (describe):
(These terms supplement the terms of payment provided in this Section 3 and the Estes General Conditions. To the extent of direct conflict between these special terms and the terms provided in Sections 22 and 23 of Estes General Terms, these special terms shall control.)

Please Note: Pre-arranged deposits may be invoiced, upon execution of this Agreement, using the current edition AIA G702/703. Payment will be released when Estes receives pre-payment from the Owner, and is otherwise subject to the terms of the Subcontract.

SAMPLE

Progress payments and final payment will be conditioned on Contractor's receipt of the documents and other deliverables required by Section 23 of the Estes General Conditions and shall be submitted via Prolog, Procore or such other software, program or in such other form designated by Estes.

Submittals required in this Subcontract or otherwise requested by Estes shall be submitted as specified in the submittal schedule adopted by the Parties or, if none, by the date specified by Estes. All submittals shall be submitted via Prolog, Procore or such other software, program or in such other form designated by Estes unless otherwise agreed to by Estes.

RETAINAGE PERCENT: %

4. OTHER SPECIAL TERMS:

THIS SUBCONTRACT, including Exhibits and Attachments listed on the signature page below, and made a part hereof, constitutes the entire understanding of the Parties and supersedes any prior quotations, proposals or agreements.

[Signature Page Follows]

SAMPLE

IN WITNESS WHEREOF, the Parties hereto have executed this Subcontract as of the Effective Date.

X	***EXHIBIT A*** - Scope of Work	X	***ATTACHMENT*** - Sub-Subcontractors & Suppliers List
X	***EXHIBIT B*** - Insurance and Indemnity Requirements	X	***ATTACHMENT*** - AIA Pay Application Sample
X	***EXHIBIT C*** - Estes General Conditions	X	***ATTACHMENT*** - Schedule of Values
☐		☐	
☐		☐	

ACCEPTANCE:

SUBCONTRACTOR NAME	**ESTES COMPANY LLC**	**ESTES COMPANY LLC**
SIGNATURE	SIGNATURE	SIGNATURE
AUTHORIZED REPRESENTATIVE/TITLE	AUTHORIZED REPRESENTATIVE/TITLE	AUTHORIZED REPRESENTATIVE/TITLE
PRINTED NAME	PRINTED NAME	PRINTED NAME
DATE	DATE	DATE

SAMPLE

PROJECT #:
PROJECT NAME:
SUBCONTRACTOR:

EXHIBIT A
SCOPE OF WORK (SUBCONTRACT)

Subcontractor shall execute the following Scope of Work including all labor, materials, equipment, supervision, clean-up (see full description below), services, insurance and incidentals required to complete such portion of the Work, except to the extent specifically indicated in Subcontract Document to be the responsibility of others:

Clean-up by Subcontractor will be daily, or Contractor may perform the work and deduct the cost from the payments due Subcontractor. Daily clean-up shall include removal of all small trash associated with subcontractor's work including but not limited to small boxes and wrappings, lunch and other food trash, bottles, etc. used by subcontractor's employees and any spent materials such as welding rods, cut pieces of lumber, shipping skids, etc. Daily clean-up also includes broom cleaning areas periodically as required to maintain a clean floor area.

Work to be performed in accordance with the following **Plans & Specifications:**

Reference Addenda, if applicable:
Reference Alternate(s), if applicable:
Pre-Award interview included, if applicable

Work must adhere to Estes Construction schedule including periodic updates (with specifics as follows):
Duration of work: as needed to maintain schedule
Crew Size: as needed to maintain schedule

SUBMITTAL SCHEDULE

Description:	**Due date to Estes:**
Description:	**Due date to Estes:**
Description:	**Due date to Estes:**

F.O.B. Jobsite delivery instructions:

SCOPE OF WORK:

SAMPLE

STANDARD MINIMUM REQUIREMENTS FOR SUBCONTRACTORS ON ESTES CONSTRUCTION PROJECTS

EXHIBIT B (EXAMPLE ONLY)

- **These are the minimum insurance requirements for Estes Construction projects. To the extent the Prime Contract between Estes Construction and Project Owner contains greater requirements and/or terms and conditions, the requirements and/or terms and conditions of the Prime Contract will prevail.**
- **ALL costs associated with meeting insurance requirements will be the sole responsibility of Subcontractor and should be taken into consideration when submitting costs for your Work.**
- **IF you forward this information to your insurance agent, you must make them aware that project specific requirements will be determined by the Prime Contract.**

1. INSURANCE AND SURETY REQUIREMENTS:

a. The requirements of *this Exhibit* apply to sub-subcontractors of any tier. It is Subcontractor's responsibility to provide these requirements to every subcontractor you hire and verify their compliance.

b. **ALL** insurance coverage and surety bonds shall be issued by companies with AM Best Financial Strength Classifications not less than A- and Financial Size Classifications not less than VIII.

c. **Subcontractor agrees that its obligation to comply with ALL of the provisions of this Subcontract and any requirements of the Owner or a higher tier contractor of any type is solely the Subcontractor's responsibility.** Failure on the part of the Subcontractor or the Contractor or any of their agents to discover, identify or remedy any deficiencies, non-compliance or failure to maintain compliance shall not in any way relieve Subcontractor of any of the obligations of this agreement. Non-compliance constitutes a breach of contract. In the event of non-compliance, the Contractor retains all of its right to any and all legal remedies available to it, including but not limited to: termination of Subcontract and replacement of Subcontractor, withholding of payment, charging back the costs of additional insurance to Subcontractor and placing insurance on behalf of Subcontractor.

d. Subcontractor is responsible to keep insurance in force that meets the requirements of this Exhibit. Coverage shall be maintained and certificates evidencing continuation of the required coverage shall be furnished for the longer of (i) three years following substantial completion of the Subcontractor Work; (ii) the period equivalent insurance coverage is required to be carried by the Contractor under the Prime Contract; or (iii) the period ending on date on which a claim related to the Subcontractor Work would be barred by the statute of repose. Subcontractor is required to notify Contractor, or its appointed representative, if Subcontractor's insurance is no longer in compliance with Contractor's requirements or is cancelled or non-renewed for any reason, prior to such change, cancellation or non-renewal taking place. In addition, Subcontractor agrees to obtain and maintain an endorsement or policy provision to Subcontractor's policies obligating Subcontractor's insurer to provide Contractor or its appointed representative 30 days advance and written notice if the policy cancels, terminates or is non-renewed for any reason (10 days for non-payment of premium).

e. If any or all of the Subcontractor's Insurance Limits are greater than the requirements in this insurance EXHIBIT, the limits required of the Subcontractor are revised to the Subcontractor's actual Insurance Limits.

f. Subcontractor agrees that it is solely responsible for its own equipment and tools and Subcontractor agrees to hold Contractor harmless and waive subrogation against Contractor for any damage to said equipment and tools.

SAMPLE

STANDARD MINIMUM REQUIREMENTS FOR SUBCONTRACTORS ON ESTES CONSTRUCTION PROJECTS

2. INSURANCE TERMS AND CONDITIONS

COMMERCIAL GENERAL LIABILITY (occurrence form)
- **$1,000,000** per occurrence
- **$2,000,000** General aggregate & Products/Completed operations aggregate

See Section 3.

- Including Premises & operations, Products / Completed Operations, Personal Injury, Contractual Liability, and Independent Contractors
- Per Project Aggregate
- Non-Waiver of Governmental Immunities Endorsement required

ADDITIONAL INSURED REQUIREMENT: Primary & Non-Contributory / Operations & Completed Operations must include: Estes Company LLC, Owner, and any other entity which Contractor is required to name as an Additional Insured per the Prime Contract.

WAIVER OF SUBROGATION in favor of: Estes Company LLC and any other entity which Contractor is required to name per the Prime Contract.

➢ **We will not accept:**

1) General Liability coverage that contains endorsement ***"CG 22 94 EXCLUSION – DAMAGE TO WORK PERFORMED BY SUBCONTRACTORS ON YOUR BEHALF"*** or similar policy limitations.
2) General Liability coverage that contains an ***Exterior Insulation and Finish Systems*** (**EIFS**) exclusion if your Scope of Work includes **EIFS**.
3) A residential exclusion that applies to the project. If the project is for any residential purpose of any kind, you are required to provide copies of such endorsements for our review and approval.

➢ If you or your sub-subcontractors or suppliers, regardless of tier, use any owned, leased, chartered, or hired aircraft of any type or any unmanned aerial vehicle (e.g., drones) in the performance of any Subcontract, you shall, and shall cause all such sub-subcontractors and/or suppliers to, maintain the appropriate liability insurance including Passenger Liability if applicable. Coverage shall be on an occurrence basis and include bodily injury, property damage, and personal & advertising injury with limits no less than $1,000,000 per occurrence and $2,000,000 in the annual aggregate.

COMMERCIAL AUTO LIABILITY
- **$1,000,000** per accident for Bodily Injury and/or Property Damage

- Including Hired and Non-owned Automobile Liability
- Symbol 1, any auto

ADDITIONAL INSURED REQUIREMENT: Estes Company LLC and any other entity which Contractor is required to name as an Additional Insured per the Prime Contract.

WAIVER OF SUBROGATION in favor of: Estes Company LLC and any other entity which Contractor is required to name per the Prime Contract.

UMBRELLA LIABILITY COVERAGE –
- **$3,000,000** per occurrence
- **$3,000,000** annual aggregate

- The policy must be excess over General Liability, Auto Liability, and Employer's Liability policies

ADDITIONAL INSURED REQUIREMENT: Non-Contributory / Operations & Completed Operations must include: Estes Company LLC, Owner, and any other entity which Contractor is required to name as an Additional Insured per the Prime Contract.

WAIVER OF SUBROGATION in favor of: Estes Company LLC and any other entity which Contractor is required to name per the Prime Contract.

WORKERS' COMPENSATION / OCCUPATIONAL DISEASE**
Employer's Liability

$500,000 Bodily Injury by Accident
$500,000 Bodily injury by Disease each employee
$500,000 Bodily Injury by Disease policy limit

- Coverage scope sufficient to discharge obligations under all applicable state workers' compensation laws or other similar federal laws when applicable

WAIVER OF SUBROGATION in favor of: Estes Company LLC and any other entity which Contractor is required to name per the Prime Contract.

******Alternatively, if Contractor has no employees (including casual employees or day labor) and Contractor completes, files and provides proof of acceptance of the state waiver of Workers Compensation benefits, this requirement will be waived.

DESIGN ERRORS & OMISSIONS (PROFESSIONAL LIABILITY)***
- **$1,000,000** per occurrence
- **$1,000,000** annual aggregate

- Required when Subcontractor provides Engineering or Design Services (including field design) **OR** when required by Prime Contract.

*****These requirements may be met with a combined PROFESSIONAL LIABILITY and POLLUTION LIABILITY policy.**

POLLUTION LIABILITY ***
- **$1,000,000** aggregate limit

- Required when Subcontractor provides remediation, treatment, storage or disposal of waste/hazardous materials, EFIS, Demolition/Earthwork **OR** when required by Prime Contract

Note: Any combination of Primary and Excess Limits may be used to comply with the total limit requirements by line of coverage.

SAMPLE

3. ADDITIONAL PROVISIONS

a. **CERTIFICATES AND REQUIRED PROVISIONS**
Prior to start of work, the above referenced entities shall be included as Additional Insured on the Subcontractor's policies as required in *this Exhibit*. Subcontractor's insurer must utilize Endorsements **CG 2010 (10/01)** and **CG 2037 (10/01)** or other similar endorsements (or policy forms) that provide equivalent coverage. Subcontractor and Subcontractor's insurer agree to Waive Subrogation on all policies as noted in this Exhibit. At its sole discretion, Contractor or its appointed representative reserves the right to request a certified copy of Subcontractor's insurance contracts and/or copies of any and all applicable forms and/or endorsements necessary to comply with any of these requirements.

b. **OWNERS AS ADDITIONAL INSUREDS ON SUBCONTRACTOR'S LIABILITY COVERAGE****
Owners and in some cases architects or other third parties must be included as (an) Additional Insured(s) for both Ongoing Work and Completed Operations. ***This is a common requirement.*** Since you do not have a direct contract with the Owner or other third parties, insurers have developed a means for you to comply. Subcontractor's insurer must utilize Endorsements **CG 2038 (4/13)** for Ongoing Work and **CG 2040 (12/19)** for Completed Operations or other similar endorsements (or policy forms) that provide equivalent coverage.

****NOTE:** Language that restricts the provision of Additional Insured status only to parties with whom you have a direct contract will be rejected as non-compliant.

c. **VERTICAL EXHAUSTION**
Where allowed by law, vertical exhaustion of limits is required.

d. **AUTOMATIC CERTIFICATE**
An annual certificate in compliance with all of the requirements in this Exhibit eliminates the need for certificates for each individual project.

SAMPLE

EXHIBIT C
ESTES COMPANY LLC GENERAL TERMS AND CONDITIONS
(SUBCONTRACT)

1. **INDEPENDENT CONTRACTOR RELATIONSHIP:** Subcontractor is an independent contractor and not an employee or agent of Contractor. No personnel furnished by Subcontractor shall be deemed under any circumstances as agents, employees or servants of Contractor or Owner. Subject to the terms of this Subcontract, Subcontractor shall control the conditions, time, details, and means by which Subcontractor and its Related Parties (defined below) perform the Subcontractor Work. Subcontractor has no authority to bind Contractor to any obligation or liability, or to act for or on Contractor's behalf. Subcontractor and its employees and subcontractors ("Sub-subcontractors") shall be ineligible for, and shall not receive, any employee benefit from Contractor, and Subcontractor, unless otherwise expressly provided in this Subcontract, shall be solely responsible for the payment of all taxes, FICA, federal and state unemployment insurance contributions, state disability premiums, and all similar taxes and fees relating to the fees paid to Subcontractor hereunder or by Subcontractor to its Related Parties.

   A Party's "Related Parties" means the officers, employees, contractors, consultants, subcontractors, Sub-subcontractors, sub-consultants and affiliates, in each case, other than the other Party and such other Party's Related Parties, and "Related Party" is any one of such persons. Subcontractor is solely responsible for its Related Parties.

2. **WORK TO BE PERFORMED:** Subcontractor shall provide all labor, materials, equipment, wages, tools, supervision, and all items of expense necessary for Subcontractor to complete and satisfactorily perform the Subcontractor Work. Any equipment, materials or services not specifically described in Subcontract Documents, but reasonably required or necessary for Subcontractor to complete the Subcontractor Work or required to conform the Subcontractor Work to comply with Applicable Law (defined below) shall be Subcontractor's sole responsibility and included in the Subcontractor Work, the same to be provided at Subcontractor's expense, subject only to reimbursement as expressly provided in this Subcontract. Unless otherwise agreed to by the Parties, all Subcontractor Work shall be supplied and furnished at the Project site. "Applicable Law" means all laws, ordinances, codes, orders, rules, regulations or requirements of all federal, state and municipal governments and appropriate departments, boards and officers thereof, or any other body or entity exercising jurisdiction over the Project, the Subcontractor Work or the Subcontractor or Contractor, as amended from time to time. Subcontractor represents it is qualified to perform the Subcontractor Work in accordance with the Subcontract Documents.

3. **DRAWINGS, SPECIFICATIONS:** Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown and mentioned in both. In case of conflict or inconsistency between the specifications and the drawings, or in case of discrepancies, omissions and errors, the matter needing clarification shall be submitted immediately to Contractor in writing for determination by Contractor and directions to Subcontractor.

   Subcontractor agrees to furnish such drawings and data pertaining to the Subcontractor Work in accordance with the schedules provided in this Subcontract and otherwise as Contractor may specify or require from time to time. Contractor is not required to approve drawings and data furnished by Subcontractor, but Contractor reserves the right to review and comment on such drawings and data to the extent, if any, that Contractor deems desirable to conform Subcontractor's performance to the Subcontractor Work required by the Subcontract Documents. Subcontractor, however, shall begin and continue performance of the Subcontractor Work without waiting for approval or comments. Drawings will not be returned to Subcontractor unless Contractor elects to make comments. Any such review and comment by Contractor, or any failure to review, unless expressly agreed in writing to the contrary, shall not alter any of the terms and conditions of the Subcontract or relieve Subcontractor of any responsibility or liability for the accuracy and completeness of such data and materials or be interpreted to imply approval of such drawings or data by Contractor.

4. **CHANGES IN SPECIFICATIONS AND DRAWINGS:** Contractor reserves the right to make any changes in the specifications and drawings by giving written Notice of Changes to Subcontractor. If such changes cause a material increase or decrease in the cost of performing the Subcontractor Work or the time for performance, and written notice thereof is given by Subcontractor to Contractor within five (5) days after receipt of such Notice of Changes, an equitable adjustment in the Subcontract Sum and the time of performance shall be agreed upon. Nothing herein shall be interpreted to give Contractor the ability to make changes that would otherwise require Owner's consent under the Prime Contract, without such Owner consent.

5. **RESPONSIBILITY FOR WORK:** Subcontractor represents it has had full opportunity to examine the Subcontract Documents and the Project site to determine the scope of work involved and the Project site conditions, and hereby assumes, without reliance on any representation or warranty of any kind from Contractor or Owner, full responsibility for the performance of the Subcontractor Work as required by the Subcontract Documents. By executing this Subcontract, Subcontractor represents that it has carefully read and understands the Subcontract Documents, and enters into this Subcontract based on its own examination and investigation, and not in reliance on the Contractor's or the Owner's, or their respective Related Parties', opinions or representations. Notwithstanding the foregoing, if Subcontractor encounters (i) conditions at the Project site that are (a) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Subcontract Documents; or (b) 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 Subcontract Documents; or (iii) human remains or recognizes the existence of burial markers, archaeological sites, or wetlands; then, in each such case, Subcontractor shall immediately provide notice to the Contractor and shall have received the Contractor's authorization to proceed with further Subcontractor Work before conditions are disturbed. The Contractor will promptly investigate, or cause the prompt investigation of, such conditions and, if the Contractor determines that they differ materially and cause an increase or decrease in the Subcontractor's cost of, or time required for, performance of any part of the Subcontractor Work, will recommend an equitable adjustment in the Subcontract Sum or time for performance of the Subcontractor Work, or both, with any corresponding adjustment, to the extent agreed to, to be memorialized in a Change Order. Subcontractor shall be responsible for all materials delivered and work performed until completion and written acceptance of the Subcontractor Work by Contractor and Owner, and upon completion, the Subcontractor Work shall be delivered and turned over to Contractor complete and undamaged. Any materials or products furnished by Contractor for use by Subcontractor shall be used by Subcontractor in a conservative and economical manner.

6. **SUBCONTRACTOR'S EMPLOYEES:** Subcontractor shall employ a competent Project Manager and Superintendent who, on behalf of Subcontractor, shall have complete control of all Subcontractor Work and Subcontractor's employees and, subject to Contractor's rights under this Subcontract, Subcontractor's Sub-contractors. Subcontractor shall advise Contractor in writing of the name, address and telephone number (day and night) of Subcontractor's designated Project Manager and Superintendent. Subcontractor shall not employ

unfit persons or persons not skilled in the tasks assigned to them or employees who are uncooperative with Contractor's or Contractor's other subcontractor(s), or their respective employees or agents. Any person who, in the sole opinion of Contractor, is determined to be unqualified to perform the Subcontractor Work required, or is otherwise objectionable to Contractor or Owner, in each case, either as an employee, agent or another Sub-subcontractor, shall not be allowed to be present at the Project site upon notification by Contractor to Subcontractor. Subcontractor shall keep himself and Contractor fully advised as to all pertinent local and regional labor agreements and practices, including any local labor union contract negotiations occurring during the Term (defined below) of this Subcontract. In the event Subcontractor has a collective bargaining agreement, either locally or nationally, with a labor union engaged in local negotiations, or if Subcontractor will be affected, either directly or indirectly, by the outcome of said local negotiations, Subcontractor agrees to join said negotiations, if legally permissible, and participate or associate itself with the local contractor or contractors involved in said negotiations in an endeavor to resolve the labor dispute.

Subcontractor shall not discriminate against any employee or applicant for employment because of race, sex, sexual orientation, religion, color, age, disability, origin, veteran status, marital status, or any other protected basis under Applicable Law. Subcontractor shall comply with Owner's non-discrimination requirements.

All labor used throughout the Subcontractor Work shall be acceptable to Owner, Architect and Contractor and of a standing or affiliation that will permit the Subcontractor Work to be carried on harmoniously and without delay, and that will in no case or under any circumstances cause any disturbance, interference, or delay to the progress of the building, structures, or facilities, or any other work being carried on by Owner, Architect or Contractor in any other town or city in the United States.

In the prosecution of all Subcontractor Work covered by this Subcontract, or on this Project, Subcontractor agrees to recognize and comply with all agreements of Contractor with local building trade councils and/or separate unions concerning labor and working conditions and otherwise, applicable to this work, insofar as these agreements do not conflict with or violate any Applicable Law.

Subcontractor shall maintain weekly payroll records including fringe benefits and any other information necessary to assure employees performing the Work are receiving appropriate wages and fringe benefits collectively. Contractor reserves the right to request, in writing, these payroll records from Subcontractor, which then must be provided to Contractor within 10 business days.

Subcontractor agrees that where the Subcontractor Work or Contractor's Work is stopped or delayed or interfered with by strikes, slow-downs, or work interruptions resulting from the acts or failure to act of the employees or another Related Party of Subcontractor in concert, or by any breach of the provisions above, then such shall be a default under this Subcontract and Contractor shall have the remedies provided for herein even though Subcontractor's employees may be engaging in work stoppage solely as a result of a labor dispute involving Contractor or others and not in any manner involving Subcontractor.

7. WORKING CONDITIONS: Subcontractor shall comply with the following provisions:

a. All of Subcontractor's employees engaged in performing the Subcontractor Work, as well as Subcontractor's Related Parties shall be subject to the rules and regulations set by Contractor and Owner for the safe, orderly and efficient conduct of all operations at the Project site and, more generally, the terms of this Subcontract.

b. Subcontractor will include the terms of Section 7(a) in every subcontract executed between Subcontractor and another Sub-subcontractor so that these terms will be binding upon other subcontractors.

8. SCHEDULING WORK: Contractor represents that Contractor, Owner and other contractors and subcontractors may be working at the Project site during the performance of this Subcontract. Contractor reserves the exclusive right to direct Subcontractor to organize the order, sequence and schedule of performance of the Subcontractor Work in such a manner as to avoid interference with the performance of work by Contractor, Owner, and other contractors or subcontractors. Subcontractor agrees and understands that coordination with Contractor and other subcontractors is required during completion of the Subcontractor Work. Weekly meetings will be conducted on the Project site for coordination of such Work. A representative authorized to act for, and bind, Subcontractor and, if different, Subcontractor's Project Manager and Superintendent, must attend all such meetings. Schedules adopted at such meetings will be binding on the Parties. Subject to Contractor's rights hereunder, Subcontractor shall coordinate and fit the Subcontractor Work with the work of other subcontractors and separate contractors of the Contractor and Owner, and shall plan and execute the Subcontractor Work with such other subcontractors and separate contractors to ensure the work constituting all of the Project comes together and complies with the Prime Contract and the Subcontract Documents.

The Parties have agreed to a time schedule establishing deadlines for the completion of the various portions of Subcontractor's Work (the "Subcontract Project Schedule"). The sequence of commencement and completion of separable portions of the Subcontractor Work shall be according to the deadlines imposed by Contractor under the Subcontract Project Schedule. Subcontractor shall make available for Contractor's or Owner's use during the progress of the Subcontractor Work any portion of the Subcontractor Work completed as Contractor may direct. Contractor may terminate this Subcontract, per Section 27, if Contractor, in its sole opinion, determines Subcontractor will not complete or has not completed the Subcontractor Work within the required completion schedule, as set forth on the Subcontract Project Schedule. Contractor also may, in its sole opinion, determine Subcontractor will not or has not completed the Subcontractor Work within the required Subcontract Project Schedule and engage additional labor or additional firm(s) to complete the Subcontractor Work within the Subcontract Project Schedule, including by requiring overtime of its employees, agents, and Sub-subcontractors, in any case, at no additional cost to the Contractor or increase to the amount due to Subcontractor. If Contractor determines it is necessary for it to complete any portion of the Subcontractor Work, in addition to any other right it may have hereunder, at law, or in equity, it may do so, and any additional expense incurred by Contractor to engage additional labor or firms will be deducted from any amount due the Subcontractor.

If the Subcontractor Work is not completed within the time required by the Subcontract Documents and Subcontractor, in Contractor's reasonable opinion, is responsible for the delay of others or the Project as a whole, Subcontractor shall be responsible for any costs or damages incurred by Contractor on account of the delay, including, without limitation, liquidated damages contemplated under the Prime

Contract, which Subcontractor has reviewed and acknowledges as a reasonable estimate of costs that cannot be reasonably determined on the effective date of the Prime Contract and this Subcontract.

9. INSPECTION OF WORK: All work and material furnished by Subcontractor shall be at all times open to inspection by Contractor and Owner. Subcontractor agrees to coordinate all inspection matters, including Owner's inspection, through Contractor. Inspection or failure to inspect by Contractor and/or Owner shall not relieve Subcontractor of any responsibility or liability with respect to materials and workmanship nor constitute acceptance thereof by Contractor or Owner. If upon inspection, any work or materials are determined by Contractor or Owner to be unsatisfactory, Subcontractor shall replace any unacceptable work or materials, at Subcontractor's expense, and commence such replacement or other remedy immediately upon the Contractor's demand.

If the Owner or Contractor rejects the Subcontractor Work or the Subcontractor Work does not comply with the Subcontract Documents, Subcontractor shall promptly correct the Subcontractor Work, at Subcontractor's sole cost and expense, which shall include the costs of additional testing, inspections, and compensation for services and expenses of Owner, the Architect or Contractor and related to the defective work. If Subcontractor's removal of defective work or correction of work destroys or damages the Contractor's Work or the work of the Owner, other subcontractors, or any separate contractors employed by Owner, the Subcontractor shall be responsible for the cost of such destroyed or damaged construction.

Subcontractor, to the same extent the Contractor is required under the Prime Contract and as directed by the Contractor, shall uncover the Subcontractor Work for the stated conditions or reasons stipulated in the Prime Contract. Subcontractor shall not be compensated for such services unless Contractor first receives payment for such services from the Owner. If Subcontractor fails to act as required hereunder, Contractor may otherwise undertake to replace the unacceptable work or materials at Subcontractor's expense and deduct the cost thereof from the payments due Subcontractor.

If the specifications, Contractor's instructions, Applicable Law, or any public authority require any work to be especially tested or approved, Subcontractor shall give Contractor timely notice of its readiness for inspection and, if the inspection is by another authority than Contractor, timely notice of the date fixed for such inspection.

10. REPORTS: Subcontractor shall furnish Contractor the following information and reports in writing not later than the earliest specified deadline set forth in the Subcontract Documents:

a. INFORMATION AND REPORTS REQUIRED PRIOR TO COMMENCEMENT OF THE WORK (AND THEREAFTER AS PROVIDED HEREIN OR AS REQUESTED BY CONTRACTOR).

i. A complete listing of name, complete address, phone number, and estimated value for all work performed, or materials supplied, by Sub-subcontractors or suppliers, as applicable, in each case, in amounts equal to or greater than $5,000 for the Project, or as otherwise specified by Contractor (each, a "Material Sub-subcontractor" or "Material Supplier, as applicable). In any case, such information must be provided to Contractor prior to said Material Supplier or Material Sub-subcontractor furnishing material or labor, as applicable. By providing such information, Subcontractor consents to Contractor's contact of such persons to confirm payment by Subcontractor.
ii. The value of materials, equipment, and subcontracts included in Subcontract Sum.
iii. A schedule of values of the various parts of the Subcontractor Work, including quantities, aggregating the total Subcontract Sum, divided to afford a guide for making payments hereunder. Said schedule of values will be agreed to by the Parties.
iv. Should any supplier or Sub-subcontractor change, or any change in cost by the same occur, Subcontractor must notify Contractor in writing at time of purchase or before engaging a new supplier or Sub-subcontractor, as applicable, whichever is earlier.

b. MEETINGS, INFORMATION AND REPORTS REQUIRED.

Time Deadline	Item
Daily	A force report, by crafts, to Contractor's Site Representative.
Weekly	The total number of man hours expended during the week with the total broken down by crafts.
At least three weeks before substantial completion	Closeout meeting, with follow-up closeout meetings thereafter as determined in Contractor's sole discretion.
Within two weeks after substantial completion	The total number of man hours of work expended on this Subcontract with total broken down by crafts.

In addition to the information required above, Subcontractor agrees to furnish such reports and conform with such administrative requirements required by Contractor as may be stated in the specifications or special conditions or requested from time to time.

11. CLEARING SITE: During the Term and upon final completion of the Subcontractor Work (or any corrective work), Subcontractor shall remove all debris and waste material and keep and leave the Project site in a condition satisfactory to Contractor, such obligation to include compliance with Section 13(b) of these Estes General Conditions. The obligations imposed hereunder shall survive final completion of the Work or the earlier termination of this Subcontract.

12. LAWS AND REGULATIONS: Subcontractor shall comply strictly with all Applicable Law, applicable to its business operation in the performance of the Subcontractor Work hereunder, the Project or the Project site, including the maintenance of any licenses (of Subcontractor or any Related Party of Subcontractor) required by Applicable Law. Subcontractor shall procure and pay for all permits and inspections required by any governmental or public authority for any part of the Subcontractor Work, and shall furnish any bonds, security,

or deposits required to permit performance of the Subcontractor Work. Subcontractor will promptly notify Contractor in writing if the drawings and specifications violate the requirements of any Applicable Law.

13. SAFETY REGULATIONS: Subcontractor shall take all necessary precautions to protect all property and persons from damage or injury arising from the Subcontractor Work. Subcontractor shall, while upon or about the Project site, observe and comply with all fire, safety, and other rules and regulations heretofore or hereafter prescribed by Owner or by Contractor, and shall be responsible for observance thereof by all Related Parties, including employees, agents, licensees, permitees, and Sub-subcontractors of Subcontractor.

a. Notwithstanding anything in this Subcontract to the contrary, the following safety rules must be followed: All workers at the Project site shall wear long pants, shirts, work boots, hard hats, and necessary eye and ear protection. All OSHA requirements must be followed. If these rules are not followed the same shall be default under this Subcontract, and in addition to any other remedies available to Contractor under this Subcontract, at law or in equity, Subcontractor's Work will be suspended by Contractor, upon notice to Subcontractor, until Subcontractor complies with the safety rules. Any delay in the completion of the Subcontractor Work shall be the sole responsibility of Subcontractor to correct, at no additional expense, to Contractor.

b. Clean-up by Subcontractor will be daily, and, if not otherwise completed within 24 hours of Contractor's demand, Contractor may perform the Subcontractor Work and deduct the cost from the payments due Subcontractor.

14. OCCUPATIONAL SAFETY AND HEALTH ACT: Subcontractor warrants that the Subcontractor Work to be performed under this Subcontract will comply in all respects with the Occupational Safety and Health Act (OSHA) and all Applicable Law promulgated thereunder and agrees to hold Contractor and Owner, and their respective Related Parties, harmless from and against any and all claims and Losses (defined below) which arise out of the Subcontractor's breach of this covenant and warranty or the Subcontractor Work which fails to meet these requirements. Subcontractor's obligations hereunder shall survive final completion of the Subcontractor Work or the earlier termination of this Subcontract.

15. ANTI-DISCRIMINATION: Subcontractor, in performing the Subcontractor Work, shall comply with Executive Order 11246, as amended by Executive Order 11375, Section 503 of the Rehabilitation Act of 1973, as amended, the Vietnam Era Veteran's Readjustment Assistance Act of 1974, as amended and Executive Order 11625, as amended and the rules and regulations issued thereunder and Public Law 95-507 including all Applicable Law issued covering the disadvantaged thereunder, which are hereby incorporated by reference as appropriate.

16. PERFORMANCE TIME: Time is of the essence in the performance of the Subcontractor Work and Subcontractor's obligations under the Subcontract Documents, and all actions required to be taken by Subcontractor shall be taken to the end that the performance of this Subcontract shall be fully expedited, with all Subcontractor Work completed in a manner that permits completion of the Subcontractor Work in accordance with the Subcontract Project Schedule, which permits the Project to be completed within the time specified in the Prime Contract. Subcontractor shall indemnify and hold harmless Contractor and its Related Parties from and against any Loss, including any penalty or liability incurred by Contractor (including by Owner to the extent charged to Contractor) or its Related Parties, that is caused in whole or in part by Subcontractor's failure to perform the Subcontractor Work within the time agreed upon in the Subcontract Project Schedule, such obligation to survive final completion of the Subcontractor Work or the earlier termination of this Subcontract.

17. DELAYS AND EXTENSION OF TIME: Subcontractor's sole and exclusive remedy if Subcontractor is delayed, interfered with, disrupted or hindered in performance of the Subcontractor Work is an extension of time for performing and completing the Subcontractor Work pursuant to this Subcontract, which extension shall be upon the same terms and conditions an extension of time is allowable, and only to the extent actually allowed to Contractor by Owner, under the terms of the Prime Contract, and to the extent not in conflict with another provision of this Subcontract. **SUBCONTRACTOR SHALL NOT BE ENTITLED TO, AND HEREBY WAIVES, ANY AND ALL DAMAGES WHICH IT MAY SUFFER BY REASON OF CONTRACTOR OR OWNER, OR ANY RELATED PARTY OF THE SAME, HINDERING OR DELAYING SUBCONTRACTOR IN THE PERFORMANCE OF THE SUBCONTRACTOR WORK. Further, any delay, interference, disruption, or hindrance is only subject to extension hereunder if the event giving rise to any such delay, interference, disruption, or hindrance was unforeseeable and outside Subcontractor's reasonable control.**

Any damages to Contractor for delay caused by Subcontractor may be deducted by Contractor from the Subcontract Sum, with any deficiency due within 10 days' of Contractor's written demand from the same, such obligation to survive final completion of the Work or the earlier termination of this Subcontract. The foregoing remedy shall be in addition to Contractor's other remedies at law, in equity or under this Subcontract upon a Subcontractor default.

In furtherance of the first paragraph of this Section 17, Contractor shall not be liable to Subcontractor for delay to the Subcontractor Work by the act, neglect or default of Owner, Contractor, or Architect, or by reason of fire or other casualty, or on account of riots or of strikes, or other combined action of the workmen or others, or on account of any acts of God, or any other cause beyond Contractor's control, or on account of any circumstances caused or contributed to by Subcontractor; provided, however, notwithstanding anything else contained herein, Contractor will be liable to Subcontractor for damages he incurs as a result of any acts, or failures to act, by Owner which delays or suspends the Subcontractor Work only to the extent Owner is liable for such damages and actually pays Contractor for such damages, it being expressly understood that the only obligation Contractor has to Subcontractor under this proviso is to pass on to Owner any claim Subcontractor has for damages or delays caused by Owner and to pay to Subcontractor any amounts which Owner pays to Contractor, and Contractor actually receives, as a result of Subcontractor's claim for delays caused by Owner.

The extension contemplated hereunder is further subject to Subcontractor's written notice of the delay to Contractor within forty-eight (48) hours from the time of the beginning of the delay, interference, disruption or hindrance; and under no circumstances shall Contractor be liable to pay to Subcontractor any compensation for such Contractor-caused delays. **SUBCONTRACTOR ACKNOWLEDGES AND AGREES THAT SUBCONTRACTOR'S FAILURE TO GIVE A WRITTEN NOTICE OF DELAY AS PRESCRIBED HEREIN CONSTITUTES A WAIVER BY SUBCONTRACTOR TO ANY EXTENSION OF TIME FOR SUCH DELAY, DISRUPTION, INTERFERENCE OR HINDRANCE AND, BECAUSE SUCH EXTENSION IS THE SOLE REMEDY AVAILABLE FOR ANY SUCH DELAY, DISRUPTION, INTERFERENCE OR HINDRANCE, A WAIVER OF ANY OTHER RIGHT OR REMEDY WITH RESPECT THERETO.**

Subcontractor's written notice of delay must be by certified mail and contain evidence establishing that the delay in completion of the Subcontractor Work arises from unforeseeable causes beyond the control, and without the fault or negligence of Subcontractor or any Related Party of Subcontractor. Contractor shall ascertain the facts and the extent of the delay and extend the time for completing Subcontract, when in its sole judgment and discretion an extension is appropriate. Contractor's findings shall be final and conclusive as to Subcontractor's entitlement for time extensions.

18. ROYALTIES AND PATENTS: Subcontractor hereby warrants the design, use, installation or sale of items, materials and equipment designed, manufactured or constructed by Subcontractor or its Related Parties will not infringe any patents, copyrights or other intellectual property rights (or claimed rights to the same); and Subcontractor agrees to indemnify, hold harmless and, upon Contractor's request and with counsel reasonably acceptable to Contractor, defend the Indemnitees, at Subcontractor's sole expense, against all Losses based on any such alleged infringement, except that Subcontractor does not warrant and its indemnity hereunder shall not extend to any design furnished by Contractor. Further, and notwithstanding the foregoing, Subcontractor does not warrant against, and shall not be responsible for claims of patent infringement based solely on the use of such materials or equipment in combination with other material or equipment in the operation of any process other than such process as may be inherent in the use of such materials or equipment.

19. LIENS AND CLAIMS: Subcontractor shall pay, compromise and settle any claims of lien and any lien filed by a Sub-subcontractor or supplier of Subcontractor, and Subcontractor does hereby indemnify, hold harmless, and, upon Contractor's request and with counsel reasonably acceptable to Contractor, defend the Indemnitees from all Losses arising out of such claims of lien or liens, including, Contractor's reasonable attorneys' fees, and shall remove such liens promptly, such obligations to survive final completion of the Subcontractor Work or the earlier termination of this Subcontract. Notwithstanding the foregoing, Contractor, in its sole discretion, may pay or settle any such claim or lien and deduct all costs and expenses incurred by Contractor related thereto from the Subcontract Sum.

Contractor is entitled to recover its reasonable attorney's fees incurred to prosecute or defend any claim or Loss arising from Subcontractor's Work or failure to perform its work. Nothing herein shall be construed as Contractor's consent to dispute resolution in a forum other than as provided in Section 19.1 of these Estes General Conditions.

Subcontractor shall immediately pay and discharge, or shall provide security sufficient and satisfactory in itself to pay and discharge, any obligation or alleged obligation Subcontractor or any of its Sub-subcontractors may have, in aid of the enforcement of which a lien or right of any kind is established, or is attempted to be established, upon or against the Subcontractor Work or the Project site.

19.1 DISPUTE PROCEDURES: In case of any dispute between Subcontractor and Contractor, Subcontractor agrees to be bound to Contractor to the same extent that Contractor is bound to Owner by the terms of the Prime Contract and by any and all decisions or determinations made thereunder by the party or board so authorized in the Prime Contract. Subcontractor also agrees to be bound to Contractor to the same extent Contractor is bound to Owner by the final decision of a panel, individual, mediator/arbitrator, or a court of competent jurisdiction, whichever applies, whether or not Subcontractor is a party to such proceeding. If such a dispute is prosecuted or defended by Contractor against Owner under the terms of the Prime Contract, Subcontractor agrees to cooperate and to furnish all documents, statements, witnesses, and other information required by Contractor for such purpose and other information required by Contractor for such purpose and to pay or reimburse Contractor for all expenses and costs, if any, incurred in connection therewith. It is expressly understood that as to any and all Subcontractor Work done and agreed to be done by Subcontractor and as to any and all material, equipment or services furnished or agreed to be furnished by Subcontractor, as to any and all damages, if any, incurred by Subcontractor, in connection with this Project, Contractor shall never be liable to Subcontractor to any greater extent than Owner is liable to Contractor. No dispute shall interfere with the progress of construction and Subcontractor agrees to proceed with the Subcontractor Work as directed, despite disputes Subcontractor may have against Contractor, Owner, or other parties.

If at any time any controversy should arise between Contractor and Subcontractor with respect to any matter or thing involved in this Subcontract, the Subcontract Documents, or Project, which controversy is not controlled or determined by the paragraph above or other provisions of this Subcontract, then said controversy shall be decided as follows:

a. Subject to Contractor's rights to interplead under Section 22 of this Subcontract, Subcontractor shall conclusively be bound by and abide by Contractor's written decision respecting said controversy, unless Subcontractor shall commence mediation proceedings as hereinafter provided within thirty (30) days following receipt of such written decision of Contractor.

b. If Subcontractor decides to appeal from the written decision of Contractor, then the controversy shall be decided by mediation in accordance with the then current rules of the Construction Industry Arbitration Rules of the American Arbitration Association and the mediation decision shall be final and binding on both parties; provided, however, that mediation proceedings shall be requested in writing at the address for Contractor reflected by this Subcontract, by Subcontractor to Contractor not later than thirty (30) days following Contractor's decision. In the event of any mediation proceedings between Contractor and Subcontractor, the Parties agree that Contractor shall exclusively select the mediator to hear any matter. The costs of mediation shall be paid for by the non-prevailing Party based upon the opinion of the mediator, or if there is no prevailing Party based upon the opinion of the mediator, or if there is no prevailing Party determined by the mediator's decision, then equally by Contractor and Subcontractor. Mediation, as referenced in this paragraph, shall be conducted at such site and time as is designated by Contractor but not sooner than 14 days following a written request for mediation. The mediation proceeding shall be conducted exclusively based upon Subcontract Documents.

c. In the event that a written decision has been issued by Contractor concerning any performance requirement of Subcontractor under this Subcontract and Subcontractor fails to initiate the mediation process within the aforesaid 30 days, all appeals by Subcontractor from Contractor's written decision shall lapse absolutely, with the decision of Contractor thereafter to be final without review or further appeal.

d. The results of mediation shall be final as to the dispute arising between the parties and shall be specifically enforceable in the Iowa District Court for Scott County, and each Party hereto consents to the jurisdiction and venue therein and waives any right to claim that such venue is improper or inconvenient. Each Party hereby waives, and Subcontractor shall cause its suppliers and sub-Subcontractors to waive, its right to a trial by jury to the extent permitted by law. This provision shall substantiate a motion to dismiss

by Contractor of any court action initiated by Subcontractor requesting the relief agreed to between the parties to be obtained through mediation.

e. The parties agree that the mediation process is more expedient and efficient for resolution of disputes between them in connection with construction issues which may arise under this Subcontract.

f. If Subcontractor fails to participate in the scheduled mediation proceeding, all rights originating under the written notification requesting mediation shall terminate, with the written decision adopted by Contractor to become the final decision with respect to the rights of Subcontractor.

g. If mediation is conducted between Owner and Contractor concerning any dispute between them which includes as a part thereof a disputed issue between Contractor and Subcontractor, then in that event, Subcontractor agrees upon written demand from Contractor to participate in a joint mediation with Owner, Contractor, and Subcontractor as well as with any other parties thereto, pursuant to the conditions set forth in the Prime Contract.

h. The requirements for mediation shall also apply with respect to enforcement of specifically filed claims for mechanic's liens as against the funds or against the property improved by Contractor's work. The mediation result shall be equally enforceable thereafter by any court of competent jurisdiction (as identified in subparagraph (d) of this Section) with respect to the claimed lien.

i. This Subcontract and all matters related to this Subcontract are governed by, and construed in accordance with the laws of the State of Iowa, without giving effect to any conflict of law provisions thereof that would result in the application of the laws of a different state. EACH PARTY HEREBY IRREVOCABLY AND UNCONDITIONALLY WAIVES ANY OBJECTION TO THE APPLICATION OF IOWA LAW TO THIS SUBCONTRACT.

20. INSURANCE, BONDS, AND INDEMNIFICATION:

a. **SUBCONTRACTOR'S LIABILITY INSURANCE:** Subcontractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect Subcontractor from claims set forth below which may arise out of or result from Subcontractor's operations under the Subcontract and for which Subcontractor may be legally liable, whether such operations be by Subcontractor or by Sub-subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. In addition to the following, Subcontractor agrees to comply with the entirety of ***Exhibit B – Insurance and Indemnity Requirements*** of the Subcontract and the requirements of the Prime Contract. **To the extent of a direct conflict between the requirements of this Subcontract and the Prime Contract, the Subcontract Document that contains greater requirements, terms and conditions, will prevail and control.**

1. Claims under workers' compensation or workmen's compensation, disability benefit and other similar employee benefit acts which are applicable to the Subcontractor Work to be performed.

2. Claims for damages because of bodily injury, occupational sickness or disease, or death of Subcontractor's employees.

3. Claims for damages because of bodily injury, sickness or disease, including occupational sickness, or death of any person other than Subcontractor's employees.

4. Claims for damages insured by usual personal injury liability coverage which are sustained (1) by a person as a result of any offense directly or indirectly related to employment of such person by Subcontractor, or (2) by another person.

5. Claims for damages for personal injury and advertising injury.

6. Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom.

7. Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle.

8. Claims for bodily injury or property damage arising out of completed operations.

9. Claims involving contractual liability insurance applicable to Subcontractor's obligations under Section 20d.

b. **PROPERTY INSURANCE:** As provided in the Prime Contract, Subcontractor agrees to comply and cause its insurance policies to comply with any and all property subrogation waivers present therein.

c. **PERFORMANCE BOND AND PAYMENT BOND:** Contractor shall have the right to require Subcontractor to furnish bonds covering faithful performance of the Subcontract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Subcontract Documents on the date of execution of the Subcontract.

d. **INDEMNIFICATION:** To the fullest extent permitted by law, Subcontractor shall indemnify, defend (upon Contractor's request and with counsel reasonably acceptable to Contractor), and hold harmless Contractor, Owner, Architect/Engineer Construction Manager (if other than Contractor) and their respective Related Parties; or any other persons or entities designated in writing by Owner or Contractor (collectively, the "Indemnitees") from and against all liabilities, claims, demands, assertions, damages, costs, losses and expenses including but not limited to legal and attorneys' fees, other defense, enforcement and investigative and administrative expenses and costs (collectively "Losses" and each, a "Loss") arising out of the performance of the Subcontractor Work or arising out of or resulting from the failure of Subcontractor or any Related Party of Subcontractor, including Sub-subcontractors or material

suppliers, to perform their obligations or undertakings as stated in the Subcontract Documents, including any breach of the Prime Contract caused by the Subcontractor or any Related Party, **except to the extent such Losses are caused by a party indemnified hereunder**.

In any or all Losses against the Indemnitees by any employee of Subcontractor, anyone directly or indirectly employed by it or anyone for whose acts any one of them may be liable, the indemnification obligation of this Section shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for Subcontractor under any Workers' Compensation act, disability benefit acts, other employee benefits acts or any insurance required to be carried by Subcontractor.

If Subcontractor does not have design responsibility under the Subcontract, Subcontractor has no obligation to indemnify the Architect/Engineer, its agents or employees from and against any Loss arising out of (x) the preparation by the Architect/Engineer or approval by the Architect/Engineer of maps, drawings, opinions, reports, surveys, designs or specifications, or (y) the giving of or the failure to give direction or instruction required herein to be given, if any, by the Architect/Engineer, its agents or employees, provided such giving or failure to give is required herein and is the primary cause of the injury or damage.

The indemnity provided under this Subcontract, as contemplated in this Section or another provision of this Subcontract, shall survive final completion of the Subcontractor Work or the earlier termination of this Subcontract.

21. WARRANTY: All work, materials, and products that is performed, supplied and provided by Subcontractor to the Project shall and is hereby warranted to be as follows:

a. free of any defect in design, workmanship, or construction;

b. new, unless otherwise specified, and to be of the best quality that is required by the plans, specifications, drawings and other Subcontract Documents for the Project;

c. to be fit for the particular purpose for and use by Contractor and Owner; and

d. to meet or exceed Contractor's and Owner's requirements for quantity, color, shape, quality, size and capacity required by the plans, specifications, drawings and other Subcontract Documents for the Project.

This warranty shall be enforceable during this Subcontract and endure for the period of Contractor's warranty to the Owner under the Prime Contract, unless otherwise specified. This warranty shall inure to the benefit of Owner as well as Contractor. Subcontractor agrees to repair or replace all work, materials, products or equipment that is determined by Contractor or Owner to be defective, in violation of this warranty, or otherwise constructed contrary to the Subcontract Documents. Subcontractor shall immediately correct the problem after receiving notice from Contractor or Owner. Express and implied warranties shall survive final completion or the earlier termination of this Subcontract, subject only to the express limitations imposed under this Subcontract.

Subcontractor hereby assigns to Contractor, acknowledging Contractor may further assign to Owner, all specific written warranties provided by Subcontractor, or its Related Parties, including Sub-subcontractors, suppliers and manufacturers, and all such specific warranties shall continue as noted therein.

22. COMPENSATION AND PAYMENT: Subcontractor agrees to accept the Subcontract Sum as full compensation for the Subcontractor Work and also as compensation for all loss or damage arising out of the nature of the Subcontractor Work from any unforeseen or unknown difficulties or obstructions which may arise or be encountered in the prosecution of the Subcontractor Work until its acceptance by Contractor and Owner and for all risk of every description connected with the Subcontractor Work.

Unless otherwise expressly provided hereafter in this Subcontract, Contractor shall pay to Subcontractor the Subcontract Sum, as follows:

Applications for monthly progress payments shall be in writing, on AIA Forms G702 and G703, and shall be submitted by the date provided in Section 3 of the Agreement by email to accountspayable@estesconstruction.com (with an email subject line that includes the Project name, number and address) or mailed to Contractor at 131 W 2nd St., #400, Davenport, Iowa 52801, or such other address provided by Contractor to Subcontractor, in writing, as provided in Section 33. Subcontractor may request an electronic fillable form by emailing accountspayable@estesconstruction.com. All pay applications must (i) be complete, with all pages filled out, in full; (ii) reference the Project Name, Number, and Address; (iii) be signed and notarized by Subcontractor; and (iv) be submitted in accordance with this Subcontract; or the pay application will be returned, without further processing. With each pay application, Subcontractor must deliver to Contractor a conditional lien waiver from Subcontractor, and its Material Suppliers and Material Sub-subcontractors, for the Subcontractor Work covered by such pay application. Within five (5) days of Contractor's payment of any pay application, in whole or in part, Subcontractor shall deliver to Contractor a final lien waiver, from all such parties, for the Subcontractor Work reimbursed thereunder. Compliance with the pay application provisions of this Subcontract are a condition to payment of any portion of the Subcontract Sum. Nothing herein shall limit Owner's rights to request a lien waiver under the Prime Contract as a condition to payment.

Payments otherwise due Subcontractor under this Subcontract may be withheld by Contractor for any one of the following reasons:

a. If Subcontractor has not signed and returned the Subcontract to Contractor, and provided evidence of any payment or performance bond, if required, before commencement of the Subcontractor Work;

b. If Subcontractor fails to perform or breaches the Subcontract Documents in whole or in part;

c. If Subcontractor provides defective work or materials that is not remedied;

d. If any claim or mechanic's lien is filed as a result of Subcontractor's acts or omissions;

e. If there is reasonable likelihood that a claim or a mechanic's lien may be filed as a result of Subcontractor's acts or omissions, or in the event Contractor has received notification from any material or work suppliers of Subcontractor as to nonpayment (this shall be deemed to include union benefits, if any);

f. If Subcontractor fails to make timely payments to its Sub-subcontractors or suppliers. In the event Contractor receives written notification from a third party supplying material or labor to Subcontractor in connection with the Subcontractor Work, all payments due Subcontractor up to the amount of the claimed amount shall be held either pending resolution by Subcontractor of the noted non-payment or disputed claim;

g. If Subcontractor fails to comply with and/or maintain compliance with the requirements in ***Exhibit B – Insurance and Indemnity Requirements*** of Subcontract or to provide any bond required of it under the Subcontract Documents, or evidence of the foregoing as required by the Subcontract or otherwise upon Contractor's request;

h. Reasonable evidence exists that the Subcontractor Work cannot be completed for the unpaid balance of the Subcontract Sum;

i. Subcontractor is adjudged bankrupt, it has made an assignment for the benefit of its creditors, a receiver is appointed in account of its insolvency or is subject to a garnishment;

j. If Contractor's certificate of payment, which includes any portion of the Subcontractor Work, is withheld under the Prime Contract;

k. Contractor has a reasonable belief that Subcontractor is unable or unwilling to complete the Subcontractor Work in a diligent, proper, or timely manner jeopardizing the timely or proper completion of the Subcontractor Work; or

l. Any other condition which permits Contractor to withhold payment under applicable law.

If a third party claims any amount payable to Subcontractor hereunder, in addition to any other right or remedy of Contractor under this Subcontract, at law or in equity, Contractor, at its sole option, may:

i. Initiate payment of sums due Subcontractor through an interpleader action in Scott County, Iowa;

ii. Demand mediation of Subcontractor to resolve those disputes as provided in this Subcontract; or

iii. Make any other resolution of the subordinate tier claimed issue satisfactory to it, including, but not limited to:

1) Payments due Subcontractor may be paid by Contractor in checks jointly payable to Subcontractor and/or its Sub-subcontractors and/or suppliers.

2) Payment may also be paid by Contractor directly to the unpaid Sub-subcontractors and/or suppliers on behalf of Subcontractor. In the event of a direct payment on behalf of Subcontractor to Subcontractor's Sub-subcontractor and/or supplier, the amount of that direct payment will be set-off and reduce the amount payable by Contractor to Subcontractor under this Subcontract.

Payment to Subcontractor by Contractor shall not constitute Contractor's acceptance of the Subcontractor Work.

23. PAYMENT SCHEDULE: Contractor agrees to pay Subcontractor, subject to other provisions hereof, including additions and deletions as herein provided, the Subcontract Sum. Progress payments of the Subcontract Sum shall be made only for actual Subcontractor Work performed and completed to the satisfaction of Contractor, Architect and Owner and shall be made on the basis of, and only to the extent of, payments actually received by Contractor from Owner. Progress payments of the Subcontract Sum shall be made to the extent otherwise earned under this Subcontract within ten (10) days after receipt of funds for such Subcontractor Work by Contractor from Owner. Progress payments will be made to Subcontractor each month of the Term in an amount equal to the estimated value of the labor, materials, and equipment incorporated in the Subcontractor Work plus the estimated value of the materials and equipment suitably stored at the Project site, less the retainage stated in Section 3 of the Agreement, and less the aggregate of previous payments in each case; provided, however, such progress payments shall not become due to Subcontractor until ten (10) days after receipt by Contractor of its payment from Owner for such labor, materials and equipment. Final payment will be made to Subcontractor within thirty (30) days after all of the following conditions have been met: (i) this Subcontract is fully completed and performed by Subcontractor; (ii) the Subcontractor Work is accepted in writing by Owner and Architect; (iii) full payment (**INCLUDING RETENTION)** for such Subcontractor Work has been received by Contractor from Owner; (iv) Contractor has received from Subcontractor Operation and Maintenance manuals; final, as-built drawings; attic stock; and such other information requested by Contractor and necessary for the final closeout of the Subcontractor Work and inspection and confirmation of completion of the same; and (v) the complete release of any and all claims and Losses against Contractor has been executed by Subcontractor, and any subcontractor or supplier of Subcontract, and delivered, in the form required by this Subcontract, to Contractor. Acceptance of final payment of the Subcontract Sum shall constitute Subcontractor's waiver of any claim and Losses of Subcontractor against Contractor, Owner and Architect in connection with the Subcontract Documents, except any claim or Loss that Subcontractor previously noticed Contractor of, in writing, and which Subcontractor specifically identifies at the time of its final application for payment.

Subcontractor agrees that Contractor shall be under no obligation to pay Subcontractor for any Subcontractor Work done on this Project, until Contractor has been paid therefore by Owner, and the provisions hereof, stating the time of progress and final payments and the amount thereof are subject to the condition precedent that Contractor shall receive from Owner progress or final payments in at least the amounts payable to Subcontractor on account of the Subcontractor Work. Subcontractor expressly contemplates that all payments to it are contingent upon Contractor's receiving payment from Owner, and Subcontractor expressly assumes the risk that Subcontractor will not be paid for the Subcontractor Work, in part or in full, in the event that Contractor, for whatever reason, is not paid by Owner for such Subcontractor Work. Subcontractor states that it relies primarily for payment of the Subcontract Sum on the credit and ability to pay of

Owner, and not of Contractor, and thus Subcontractor agrees that payment by Owner to Contractor for the Subcontractor Work shall be a condition precedent to any payment obligation of Contractor to Subcontractor under this Subcontract. Subcontractor agrees that the liability of the surety on Contractor's payment bond, if any, for payment to Subcontractor, is subject to the same conditions precedent as are applicable to Contractor's liability to Subcontractor. This paragraph supersedes all other provisions of this Subcontract, with any conflicting provision to be modified to be consistent herewith.

24. EXTRA WORK: Contractor may, at any time, on written order, without notice to the surety and without invalidating this Subcontract, make changes in the Subcontractor Work herein contracted for and Subcontractor agrees to proceed with the Subcontractor Work as directed and changed by Contractor's written order. Any claim for an extension of time for completion or for adjustment of the Subcontract Sum shall be resolved at the time Contractor directs performance of the extra or changed Subcontractor Work and, in absence of a written confirmation given by Contractor of the amount of such an extension or adjustment at the time such extra or changed Subcontractor Work is ordered (and subject to Subcontractor's rights to reconsideration if timely objected), it is expressly understood that no extension or adjustment is due Subcontractor for performance of the changed or extra Subcontractor Work. If the changed or extra work causes an increase or decrease in Subcontractor's cost of performance of the Subcontractor Work, or in the time required for performance, within seven days of the date of Contractor's written order, Subcontractor shall submit to Contractor an estimate showing what effect the proposed extra work or change is estimated to have on the Subcontract Sum; and, if after receipt of such estimate Contractor gives Subcontractor written authority for such extra work and for the adjustment of the Subcontract Sum in accordance with such estimate, Subcontractor shall perform such extra work and Subcontract price shall be adjusted by the amount set forth in such estimate.

If Subcontractor disagrees with Contractor's conclusion subsequent to the issuance of a written decision, Subcontractor shall immediately initiate mediation of Contractor's decision as a disputed item pursuant to Section 19.1, with any failure to do so deemed a waiver, without further notice or action, of Subcontractor's right to adjust the Subcontract Sum or revise the Subcontract Project Schedule on account of the changed or extra Subcontractor Work.

It is expressly agreed that except in an emergency endangering life or property no additions or changes to the Subcontractor Work shall be made except upon written order of Contractor, and Contractor shall not be liable to Subcontractor for any extra labor, materials, or equipment furnished without such written order. No officer, employee or agent of Contractor is authorized to direct any extra or changed work by oral order.

Nothing herein shall excuse Subcontractor from proceeding promptly with the prosecution of the Subcontractor Work as ordered in writing by Contractor, and failure to do so shall constitute a breach of this Subcontract.

25. PREMIUM PAY: Subcontractor shall not work during hours that will require Contractor to pay its employees or other contractors "premium pay" or "shift pay" unless Contractor requests in writing that Subcontractor work during hours involving premium pay or this Subcontract expressly provides otherwise. All overtime pay or premium pay incurred by Contractor as a result of Subcontractor working during premium pay hours shall be charged to Subcontractor and may be deducted from the payment due to Subcontractor unless Contractor waives this provision by giving written notice to Subcontractor specifying the days and hours when Subcontractor is entitled to work during premium pay hours.

26. TAXES AND ASSESSMENTS: Except to the extent otherwise indicated in this Subcontract, Subcontractor accepts full and exclusive liability for, and shall defend (upon Contractor's request and with counsel reasonably acceptable to Contractor) and, in all cases, hold harmless the Indemnitees from, any Loss related to the payment of any and all taxes and assessments which may now or hereafter be imposed by local, state or federal government, including without limitation, all sales, use, power, gross receipts, or other taxes levied with respect to materials furnished or work performed by Subcontractor, or payments made to Subcontractor and assessments for unemployment insurance, old age benefits, annuities, disability benefits, or other purposes which are in whole or in part measured by and/or based upon the wages, salaries, or other remunerations paid to persons employed by Subcontractor on work under this Subcontract. The indemnity provided hereunder shall survive final completion of the Subcontractor Work or the earlier termination of this Subcontract.

27. TERM; TERMINATION OF SUBCONTRACT:

a. Term. This Subcontract shall commence on the Effective Date and continue thereafter until final completion of the Subcontractor Work or the date this Subcontract is terminated, whichever is earlier (the "Term"). Subcontractor agrees to prosecute its work, and the several parts thereof at such times and in such order as Contractor considers necessary to keep the same sufficiently in advance of the other parts of the Project work, to comply with the Subcontract Project Schedule, and to avoid any delay in the substantial completion and final completion of the Project as a whole.

b. Termination by Contractor. If Subcontractor (i) fails or refuses to proceed with or to properly perform its work as directed by Contractor; or (ii) fails or refuses to properly perform or abide by any terms, covenants, conditions, or provisions contained in this Subcontract; or (iii) persistently or repeatedly fails or refuses to obey laws, ordinances, regulations or other codes of conduct; or (iv) becomes insolvent or admits its inability to pay its debts generally as they become due; or (v) becomes subject, voluntarily or involuntarily, to any proceeding under any domestic or foreign bankruptcy or insolvency law; or (vi) dissolves or liquidates or takes any partnership, corporate or company action for such purpose; or (vii) has a receiver, trustee, custodian, or similar agent appointed by order of any court of competent jurisdiction to take charge of or sell any material portion of its property or business, then, in any such case, Subcontractor shall be deemed in default of this Subcontract and the Contractor may, without waiving any other rights and remedies it may have against the Subcontractor or its sureties, terminate this Subcontract by providing written notice to the Subcontractor. The written notice of termination shall be provided at least seven (7) days before the date termination is effective for a termination under this Section 27(b). On receipt of such notice from Contractor, Subcontractor shall immediately stop the Subcontractor Work, follow Contractor's instructions, if any, and mitigate all damages and costs.

The aforesaid written notice shall not be a decision subject to mediation or appeal by Subcontractor, but shall be specifically enforceable by Contractor. Timing is of the essence with respect to any decision of Contractor to terminate this Subcontract. Subcontractor agrees that it shall not be entitled to receive any further payment until after the Project shall have been completed, in

full. If this Subcontract is terminated as provided in this Section 27(b), the Subcontractor shall be, subject to the payment terms of this Subcontract, entitled to, the lesser of the actual or schedule of value cost of the Subcontractor Work completed as of the date of termination hereunder, which amount shall be reduced by Contractor's damages, including all monies expended and all of the costs, losses, damages and extra expenses, including all management, administrative and other overhead and other direct and indirect expenses (including attorney's fees) incurred by Contractor incident to such completion. If the cost of Contractor to complete the Subcontractor Work exceeds what Subcontractor is otherwise entitled to hereunder, Subcontractor shall pay promptly to Contractor, on demand, the full amount of such excess, including the costs of collection, attorney's fees and interest thereon at the maximum legal rate of interest per annum until paid, such obligation to survive termination of this Subcontract.

In addition to any other right or remedy under this Subcontract, at law, or in equity, Contractor may take possession of the Subcontractor Work and all materials, tools, equipment, and appliances of Subcontractor and finish the Subcontractor Work by whatever means, method or agency which Contractor may, in its sole discretion, choose, or without terminating this Subcontract, Contractor may, at its option, without releasing or waiving its rights and remedies under this Subcontract, at law or in equity, against Subcontractor or Subcontractor's sureties, take any steps Contractor deems advisable to secure any labor, materials equipment, and services, and shall have a lien on and may take over all of Subcontractor's equipment, tools, appliances and materials and may prosecute the work to completion.

Contractor's determination of Subcontractor's default or defaults, made by Contractor in good faith, shall be conclusive as to Contractor's right to proceed as herein provided. The liability of Subcontractor hereunder shall extend to and include the full amount of any and all sums paid, expenses and losses incurred, damages sustained, and obligations assumed by Contractor in good faith under the belief that such payments or assumptions were necessary or required, whether actually necessary or required or not:

i. In completing the work and providing labor, materials, equipment, supplies and other items therefore or re-letting Subcontract, and (ii) in settlement, discharge or compromise of any claims, demands, suits, and judgments pertaining to or arising out of the work hereunder. A sworn itemized statement thereof or the checks of other evidence of payment shall be prima facie evidence of the fact and extent of Subcontractor's liability.

c. Termination of Prime Contract. If Owner or Contractor terminates the Prime Contract, in full, or with respect to the part involving the Subcontractor Work, Contractor shall notify Subcontractor within seven (7) days of Contractor's receipt or delivery of notice thereof, as applicable. On receipt of such notice from Contractor, Subcontractor shall immediately stop the Subcontractor Work, follow Contractor's instructions, if any, and mitigate all damages and costs. This Subcontract shall be deemed terminated on the date specified in the notice delivered by Contractor to Subcontractor hereunder. In the case of the full or partial termination of the Prime Contract, as contemplated herein, Subcontractor shall be entitled, subject to the payment terms of this Subcontract, to receive that portion of the Subcontract Sum attributable to the Subcontractor Work completed as of the date of termination, as determined by the schedule of values applicable to this Subcontract, but in no case, more than the Subcontract Sum; provided, that, if Owner terminates the Prime Contract on account of Subcontractor's default of this Subcontract, the Subcontractor shall be entitled to no more than it would be entitled under Section 27(b) of this Subcontract.

d. Notwithstanding anything in this Subcontract to the contrary, except for those Losses Owner is entitled to recover against Contractor under the Prime Contract and losses covered by insurance required by the Subcontract Documents, the Parties mutually waive all Losses against each other for consequential damages, such waiver to survive final completion of the Subcontractor Work or the earlier termination of this Subcontract.

28. ENVIRONMENTAL: Subcontractor shall comply with Contractor's obligations under the Prime Contract with respect to hazardous materials and hazardous substances, except that any notice required thereunder shall be made by Subcontractor to Contractor and Subcontractor, in addition to the indemnity provided to Owner as contemplated in this Section, shall be required to indemnify Contractor to the same extent that Contractor must indemnify Owner under the Prime Contract, with Subcontractor responsible for all hazardous materials and hazardous substances brought to the Project site by it or a Related Party of it. Such obligations shall survive the final completion of the Subcontractor Work or the earlier termination of this Subcontract.

29. NON-ASSIGNMENT: Subcontractor agrees not to assign or sublet the work, or any part thereof, nor any money to become due hereunder, without first obtaining written consent of Contractor. As a condition to such consent, Contractor may require Subcontractor to require any agreement between Subcontractor and a supplier or Sub-subcontractor to be assignable to Contractor and Owner at the end of the Term, whether as of completion of the Project, the Subcontractor Work, or otherwise, without further consent of the Subcontractor or such supplier or Sub-subcontractor.

30. SUBCONTRACT INCLUDES ENTIRE AGREEMENT: This Subcontract and the Subcontract Documents embody the entire agreement between Contractor and Subcontractor. Subcontractor represents that in entering into this Subcontract it does not rely on any previous oral or implied representations, inducements, or understandings of any kind. Any changes in the provisions of this Subcontract, or in the attachments hereto made subsequent to the execution hereof, shall be made in writing and executed by the Parties. This Subcontract shall be binding on, and inures to the benefit of, the Parties and their respective successors and assigns. Nothing herein, however, shall limit the restrictions imposed on Subcontractor assignments of this Subcontract, in full or in part.

31. SEVERABILITY: The invalidity of any provision of this Subcontract shall not invalidate the Subcontract or its remaining provisions. If it is determined that any provision of the Subcontract 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 this Subcontract shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing this Subcontract.

32. INTERPRETATION: Section and exhibit references are to this Subcontract unless otherwise specified and section headings are inserted only as a matter of convenience and in no way define, limit, or describe the scope of this Subcontract, or the intent of any provision hereof.

Words and phrases herein, including acknowledgment hereof, will be construed as in the singular or plural number, and as masculine, feminine, or neuter gender according to the context. The words "herein", "hereof" and "hereunder", and words of similar import appearing in this Subcontract, shall be construed to refer to such document as a whole and not to any particular section, paragraph, or other subpart thereof unless expressly so stated. The words "include," "includes," and "including" will be deemed to be followed by "without limitation".

33. NOTICE: Except as otherwise expressly provided in this Subcontract, all notices shall be in writing and delivered to the designated representative of the Party to whom the notice is addressed and shall be delivered by (i) personal delivery; (ii) registered or certified mail, return receipt requested and postage prepaid, or by a nationally recognized overnight courier service, in each case, to the last business address known to the Party giving notice; or (iii) email, with a delivery; and read receipt requested, to the last email address known to the Party giving notice. Notice shall be deemed duly delivered when delivered in person, 48 hours after being mailed, 24 hours after being sent by courier, or upon receipt of a delivery receipt for notices sent by email, as applicable. Notwithstanding the foregoing, notice of Claims cannot be delivered personally or by electronic email and must be sent by registered or certified mail or courier service as provided herein. A Party's designated representative and the address for receiving notices under this Subcontract is provided on page 1 of this Subcontract and may be updated by a Party by providing notice as provided in this Section.

34. CUMULATIVE REMEDIES; NON-WAIVER: Except as otherwise expressly provided in this Subcontract, including with respect to those provisions providing for liquidated damages or an exclusive remedy for a specified default, the rights and remedies of a Party shall be cumulative and no one of them exclusive of others under this Subcontract, at law or in equity. No action or failure to act by a Party shall constitute a waiver of a right or duty afforded them under this Subcontract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except, in each case, as may be specifically agreed in writing, including by express provision in this Subcontract.

35. COUNTERPARTS: This Subcontract may be executed in one or more counterparts, all of which taken together shall constitute one instrument, and if originally executed, shall be binding upon the Parties. Facsimile, electronic and pdf signatures will be given the same force and effect as original signatures.

36. AUTHORIZATION: By its execution hereof, each Party, and each signatory on behalf of the Party it is signing for, has the capacity and authority to execute, deliver, and perform this Subcontract, and to consummate the transactions contemplated hereunder. This Subcontract constitutes a valid and binding obligation of each Party, enforceable against it in accordance with its terms, subject to applicable bankruptcy, insolvency, reorganization, moratorium, or other similar laws relating to creditor's rights generally and to general principles of equity (regardless of whether such enforcement is at law or in equity).

SECTION 00 72 00
GENERAL CONDITIONS

See attached General Conditions AIA A201-2017 included after this section.

END OF SECTION

AIA® Document A201® – 2017

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)

Lincoln Irving Elementary
1015 16th Avenue
Moline, IL 61265

THE OWNER:
(Name, legal status and address)

Moline Coal Valley Community Unit School District 40
1900 52nd Avenue
Moline, IL 61265
Phone: 309.743.1000

THE ARCHITECT:
(Name, legal status and address)

Legat Architects
1515 5th Avenue, Suite 108
Moline, IL 61265
Phone: 309.517.5536

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. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

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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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. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. 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.

§ 1.1.3 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.

§ 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 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.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor.

§ 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.

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§ 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.

§ 1.2.2 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.

§ 1.3 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 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. 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 the Architect's or Architect's consultants' 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 Owner, Architect, and the Architect's consultants.

§ 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 in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 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, 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. The parties will use a building information modeling exhibit, or another agreed upon document, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 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 a building information modeling exhibit or other document per Section 1.7, shall be at the using or relying party's sole

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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.

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. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 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.

§ 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.

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§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to 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 a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 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 or approved construction schedules, and fails within a five (5)-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 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 reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's and Construction Manager's additional services 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. 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.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 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, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 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 with Construction Manager. The Contractor has satisfied itself as to the nature and location of the Work, the general and local conditions, including those bearing upon access (including partial or total restrictions on access), transportation, delivery, disposal, staging, handling and storage of

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materials, availability of labor, water, electric power, roads and uncertainties of weather, ground water table or similar physical conditions of the ground, the character, quality and quantity of existing conditions to be encountered, the character of equipment and facilities needed prior to and during the prosecution of the Work and all other matters which can in any way effect the Work or the cost thereof under this Agreement. Any failure by the Contractor to acquaint itself with all the available information concerning these conditions will not relieve the Contractor from any obligation under the Contract Documents.

§ 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 and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect 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.

§ 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 any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 In all cases where Work interconnects with existing facilities, Contractor shall field measure and verify at the site all dimensions relating to such existing facilities. Any conflicts in the Work and the existing facilities which could have been mitigated by the Contractor's obligation to verify the dimensions of the existing facilities shall be promptly rectified by the Contractor at its own expense.

§ 3.2.5 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 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. 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.

§ 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 notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 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.

§ 3.3.3 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.

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§ 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.

§ 3.4.2 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 consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 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 skilled in tasks assigned to them.

§ 3.4.4 The Contractor shall not at any time permit on the Project site any alcohol or controlled substances whether inside or outside of buildings or structures. Possession or use of any of the foregoing at or adjacent to the site shall obligate the Contractor to remove such offending personnel from the site and replace them at no additional cost to the Owner.

§ 3.4.5 The Contractor and any Subcontractors shall conform to labor laws of the State and various acts amendatory and supplementary thereto and to other laws, ordinances and legal requirements applicable thereto. Contractor shall enforce among all personnel directly or indirectly employed by it, and among all Subcontractors and their employees, all rules which the Owner may establish for conduct of such personnel on the site.

§ 3.4.6 The Contractor shall pay prevailing wages in accordance with and shall fully comply with all requirements of the Prevailing Wage Act, 820 ILCS 130/0.01, *et seq.*

§ 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. 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, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Owner is tax-exempt and will furnish Contractor with necessary Certification. The Contractor is responsible for paying any applicable sales, consumer, use and similar taxes for the Work provided not covered by the tax-exempt certificate.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 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.

§ 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.

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§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate 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 in no event later than 14 days after first observance of the conditions. 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 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. If either party disputes the Architect's determination or recommendation, that party 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. 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, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- **.1** allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- **.2** Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- **.3** whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent 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.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

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§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. 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; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. 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.

§ 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 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 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.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 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.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, 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

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coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 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.

§ 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 approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to 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 approval thereof.

§ 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.

§ 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 be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. 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.

§ 3.13 Use of Site

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.

§ 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. 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. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except

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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.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible 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 Owner or 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 the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, 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 (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, 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 a 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. The obligations of the Contractor to indemnify shall not extend to the liability of the Architect and/or Engineer, their agents or employees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications, or (2) the giving of or the failure to give directions or instructions by the Architect and/or Engineer, their agents or employees, provided such giving or failure to give is the primary cause of the injury or damage.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a 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 workers' compensation acts, disability benefit acts, or other employee benefit acts.

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 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

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§ 4.2 Administration of the Contract

§ 4.2.1 The Architect 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 the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 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, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with 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.

§ 4.2.5 Based on the Architect's evaluations 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.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect 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. However, neither this authority of the Architect 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 to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 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. 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 while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the 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.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

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§ 4.2.9 The Architect will conduct inspections to 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.

§ 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 decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions 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 decisions, 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 Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 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.

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. 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.

§ 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. 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.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, if this Project is utilizing a construction manager at-risk project delivery method, then when the lowest, responsive and responsible multiple prime trade bidder(s) are identified and awarded contracts by the Owner, each such award shall constitute the automatic assignment of that trade contract by the Owner to the Construction Manager.

§ 5.2.2 No Contract shall be entered into with a proposed person or entity to whom the Owner, Construction Manager 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 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. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, 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.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

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§ 5.3 Subcontractual Relations

By appropriate agreement, written where legally required for validity, 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.

§ 5.3.1 Each Contractor and Subcontractor acknowledges: (1) that the Owner is a direct intended third party beneficiary of each Contract between the Construction Manager and Contractor; (2) that notwithstanding any contract provision to the contrary, Contractor shall be bound to perform the Work in accordance with these AIA A201 General Conditions, as amended and modified; and, (3) that the Contractor is not a third party beneficiary of the construction management contract between Owner and Construction Manager.

§ 5.3.2 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.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

.1 assignment is effective only after termination of the Contract by the Owner and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

(Paragraph deleted)

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 under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 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

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revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules 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 obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage 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.

§ 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 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. Failure of the Contractor to notify the Architect 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. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not 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 costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 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.

§ 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 the Architect will 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.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued 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.

§ 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;

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.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.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and 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;
.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
.4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect 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 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 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
.5 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 and 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 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.

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§ 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. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party 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 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 or Contract Time, the Contractor shall notify the Architect 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 or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

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 in accordance with Section 9.8.

§ 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 confirms 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.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 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 employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; (5) by acts of terrorism, epidemics and pandemics, adverse governmental actions and unavoidable accidents or circumstances; or (6) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

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ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum 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 shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, 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. This schedule, unless objected to by the Architect, 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, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten (10) 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 and suppliers, and shall reflect retainage if provided for in the Contract Documents. Notwithstanding the foregoing or anything to the contrary in the Contract, the Contractor shall not be required to deliver a lien waiver for Work covered by the Application for Payment and may, instead, deliver a lien waiver for Work previously performed and paid in full or a conditional lien waiver that clarifies the waiver is conditioned on payment, in full of the Application for Payment.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with 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, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work 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, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.3.4 All Applications for Payment shall be accompanied by lien waivers from the Contractor and applicable Subcontractors. The lien waivers, when taken together, shall equal the sum due and paid under the immediately

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preceding Application for Payment, and shall be effective through the submittal date of the immediately preceding Application.

§ 9.3.5 All Applications for Payment shall be accompanied by the Contractor's and Subcontractors' certified payrolls as required by the Illinois Prevailing Wage Act, 820 ILCS 130/5.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven (7) days after receipt of the Contractor's Application for Payment, either (1) 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) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 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 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 and suppliers and other data 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.

§ 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 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 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; or
- **.7** repeated failure to carry out the Work in accordance with the Contract Documents.

§ 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 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

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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, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven (7) days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 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. If the Contractor fails to furnish such evidence within seven (7) days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 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 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 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 shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately, and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 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.

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§ 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 prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. 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.

§ 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, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare 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 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. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 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 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 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 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.

§ 9.9.2 Immediately prior to such partial occupancy or use, 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, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the 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 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.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with

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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) a certificate evidencing 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) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor 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.

§ 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 without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. 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.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- **.1** liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- **.2** failure of the Work to comply with the requirements of the Contract Documents;
- **.3** terms of special warranties required by the Contract Documents; or
- **.4** audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously 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

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 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 and other persons who may be affected thereby;
- **.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, or a Sub-subcontractor; and
- **.3** other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 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.

§ 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 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.

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§ 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.

§ 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 permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts 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 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 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.

§ 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 upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, 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

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(other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 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 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.

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, Architect, and Architect's consultants 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 and comply with the Public Construction Bond Act, 30 ILCS 550/0.01, *et seq*.

§ 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. Within three (3) business days of 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 or expiration. Upon receipt of 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 its usual general liability 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.

§ 11.2.2 The Owner shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on

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a replacement cost basis. The Owner is responsible for the deductible. The Owner's property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Construction Manager, Subcontractors, and Sub-subcontractors in the Project as insureds. This insurance shall include the interests of mortgagees as loss payees and shall provide coverage for direct physical loss or damage, and shall not exclude the risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, or windstorm. The insurance shall also provide coverage for ensuing loss or resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials.

§ 11.2.3 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing not less than ten (10) business days prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.4 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

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§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, 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 that the Architect 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 shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or a Separate Contractor in which event the Owner shall be responsible for payment of such costs.

§ 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.

§ 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 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 condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during

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that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 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 not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 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.

§ 12.3 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 law of the place where the Project is located.

§ 13.1.1 Contractor and each Subcontractor shall comply with the Illinois Human Rights Act, 775 ILCS 5/2-101 *et seq*., and Contractor and each Subcontractor hereby certifies that he / she / it has and will maintain at all times during the term of this agreement a written sexual harassment policy in accordance with 775 ILCS 5/2-105(A)(4).

§ 13.1.2 Contractor and each Subcontractor hereby certifies pursuant to Section 33E-11 of the Illinois Criminal Code that he / she / it is not barred from bidding on, or contracting in connection with, the Project as a result of a conviction for either bid-rigging or bid rotating under Section 33E-3 or 33E-4 of the Criminal Code.

§ 13.1.3 The Contractor and each Subcontractor hereby certifies that he / she / it will provide a drug free workplace in compliance Section 3 of the Drug Free Workplace Act, 30 ILCS 580/3.

§ 13.1.4 At least once per month, the Contractor and each Subcontractor shall submit to the Owner certified payrolls in accordance with Section 5 of the Illinois Prevailing Wage Act, 820 ILCS 130/5.

§ 13.1.5 Upon the Owner's request, any employee of the Contractor or any employee of any Subcontractor or vendor shall submit state-issued identification documents (e.g. driver's license, state identification card, etc.) or other documents to the Owner so that the Owner may obtain a criminal background check of the employee. No person who fails or refuses to produce such documents may work on the Project at the Project site. Alternatively, the Owner reserves the right to direct the Contractor, at any time during the Project, to immediately obtain criminal background checks of Contractor's or Subcontractor's employees to ascertain whether such employees have been convicted of any offenses. Such criminal background checks will be performed at Contractor's or Subcontractor's expense and at no additional cost to Owner. If in the Owner's sole discretion objectionable information regarding any employee is discovered in the background check, whether performed by Owner or Contractor, such person shall not be allowed to work on the Project at the Project site. The Owner may request new background checks of any employee at any time.

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§ 13.1.6 This contract is subject to and shall be construed in accordance with all provisions of law applicable to the Work and the Project. ll applicable rules of law shall prevail over any conflicting provision contained in any of the Contract Documents.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as it relates to Owner awarding contracts and assigning to Construction Manager as set forth in these Contract Documents neither party to the Contract shall assign the Contract as a whole 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.

(Paragraph deleted)

§ 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 as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals 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. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 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 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.

§ 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.

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§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest in accordance with the Local Government Prompt Payment Act, 50 ILCS 505/1, *et seq*.

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 fourteen (14) 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 on a 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, the Contractor may, upon seven (7) days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of thirty (30) 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 important to the progress of the Work, the Contractor may, upon seven (7) additional days' 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 or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- **.3** repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- **.4** otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, 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.

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§ 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, the Contractor 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.

§ 14.3 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 shall 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 shall include profit. 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; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other 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 and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or 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 notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within twenty-one (21) days after occurrence of the event giving rise to such Claim or within twenty-one (21) days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

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§ 15.1.3.2 Claims by either the Owner or 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 other party. 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 payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall 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

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 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, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of 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 If adverse weather conditions are the basis for a Claim for additional time, such Claim 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.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those 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 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within thirty (30) days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten (10) days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks

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sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker 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 Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten (10) days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within thirty (30) days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within thirty (30) days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, 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 Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to in-person mediation as a condition precedent to binding dispute resolution held in Scott County, Iowa.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

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§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

(Paragraphs deleted)

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PAGE 1

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Moline, IL 61265

...

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Moline, IL 61265
Phone: 309.743.1000

...

Legat Architects
1515 5th Avenue, Suite 108
Moline, IL 61265
Phone: 309.517.5536

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The Initial Decision Maker is the person identified in the Agreement to render initial decisions 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.~~Contractor.

PAGE 11

The parties shall agree upon ~~written~~ protocols governing the transmission and use ~~of, and reliance on,~~ of Instruments of Service or any other information or documentation in digital form. The parties will use a building information modeling exhibit, or another agreed upon document, to establish the protocols for the development, use, transmission, and exchange of digital data.

...

Any use of, or reliance on, all or a portion of a building information model without agreement to ~~written~~ protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in a building information modeling exhibit or other document per Section 1.7, 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.

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If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents or approved construction schedules, and fails within a ~~ten-day~~ five (5)-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

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amounts charged to the Contractor are both subject to prior approval of the Architect and the 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 reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's and Construction Manager's additional services 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. 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.

...

§ 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 with Construction Manager. The Contractor has satisfied itself as to the nature and location of the Work, the general and local conditions, including those bearing upon access (including partial or total restrictions on access), transportation, delivery, disposal, staging, handling and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, ground water table or similar physical conditions of the ground, the character, quality and quantity of existing conditions to be encountered, the character of equipment and facilities needed prior to and during the prosecution of the Work and all other matters which can in any way effect the Work or the cost thereof under this Agreement. Any failure by the Contractor to acquaint itself with all the available information concerning these conditions will not relieve the Contractor from any obligation under the Contract Documents.

PAGE 14

§ 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 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. 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.~~In all cases where Work interconnects with existing facilities, Contractor shall field measure and verify at the site all dimensions relating to such existing facilities. Any conflicts in the Work and the existing facilities which could have been mitigated by the Contractor's obligation to verify the dimensions of the existing facilities shall be promptly rectified by the Contractor at its own expense.

§ 3.2.5 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 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. 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.

PAGE 15

§ 3.4.4 The Contractor shall not at any time permit on the Project site any alcohol or controlled substances whether inside or outside of buildings or structures. Possession or use of any of the foregoing at or adjacent to the site shall obligate the Contractor to remove such offending personnel from the site and replace them at no additional cost to the Owner.

§ 3.4.5 The Contractor and any Subcontractors shall conform to labor laws of the State and various acts amendatory and supplementary thereto and to other laws, ordinances and legal requirements applicable thereto. Contractor shall enforce among all personnel directly or indirectly employed by it, and among all Subcontractors and their employees, all rules which the Owner may establish for conduct of such personnel on the site.

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§ 3.4.6 The Contractor shall pay prevailing wages in accordance with and shall fully comply with all requirements of the Prevailing Wage Act, 820 ILCS 130/0.01, *et seq.*

...

The ~~Contractor shall pay~~ Owner is tax-exempt and will furnish Contractor with necessary Certification. The Contractor is responsible for paying any applicable sales, consumer, use and similar taxes for the Work provided ~~by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.~~not covered by the tax-exempt certificate.

PAGE 19

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, 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 (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, 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 a 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. The obligations of the Contractor to indemnify shall not extend to the liability of the Architect and/or Engineer, their agents or employees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications, or (2) the giving of or the failure to give directions or instructions by the Architect and/or Engineer, their agents or employees, provided such giving or failure to give is the primary cause of the injury or damage.

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§ 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.~~
if this Project is utilizing a construction manager at-risk project delivery method, then when the lowest, responsive and responsible multiple prime trade bidder(s) are identified and awarded contracts by the Owner, each such award shall constitute the automatic assignment of that trade contract by the Owner to the Construction Manager.

§ 5.2.2 ~~The Contractor shall not contract~~ No Contract shall be entered into with a proposed person or entity to whom the ~~Owner~~ Owner, Construction Manager 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 objection.

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By appropriate ~~written agreement,~~ agreement, written where legally required for validity, 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. ~~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~~

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~~Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.~~

§ 5.3.1 Each Contractor and Subcontractor acknowledges: (1) that the Owner is a direct intended third party beneficiary of each Contract between the Construction Manager and Contractor; (2) that notwithstanding any contract provision to the contrary, Contractor shall be bound to perform the Work in accordance with these AIA A201 General Conditions, as amended and modified; and, (3) that the Contractor is not a third party beneficiary of the construction management contract between Owner and Construction Manager.

§ 5.3.2 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.

...

.1 assignment is effective only after termination of the Contract by the Owner ~~for cause pursuant to Section 14.2~~ and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and

...

§ 5.4.2 Upon ~~such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.~~assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

~~**§ 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. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.~~

PAGE 25

§ 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 employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; ~~or (5)~~ (5) by acts of terrorism, epidemics and pandemics, adverse governmental actions and unavoidable accidents or circumstances; or (6) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

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§ 9.3.1 At least ten (10) 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

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requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents. Notwithstanding the foregoing or anything to the contrary in the Contract, the Contractor shall not be required to deliver a lien waiver for Work covered by the Application for Payment and may, instead, deliver a lien waiver for Work previously performed and paid in full or a conditional lien waiver that clarifies the waiver is conditioned on payment, in full of the Application for Payment.

...

§ 9.3.4 All Applications for Payment shall be accompanied by lien waivers from the Contractor and applicable Subcontractors. The lien waivers, when taken together, shall equal the sum due and paid under the immediately preceding Application for Payment, and shall be effective through the submittal date of the immediately preceding Application.

§ 9.3.5 All Applications for Payment shall be accompanied by the Contractor's and Subcontractors' certified payrolls as required by the Illinois Prevailing Wage Act, 820 ILCS 130/5.

§ 9.4.1 The Architect will, within seven (7) days after receipt of the Contractor's Application for Payment, either (1) 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) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.
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§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven (7) days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

...

§ 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. If the Contractor fails to furnish such evidence within seven (7) days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

...

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended ~~appropriately~~ appropriately, and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.
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§ 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.~~located and comply with the Public Construction Bond Act, 30 ILCS 550/0.01, *et seq*.

...

§ 11.2.1 The Owner shall purchase and maintain its usual general liability 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

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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.

§ 11.2.2 ~~Failure to Purchase Required Property Insurance.~~ ~~If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.~~The Owner shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Owner is responsible for the deductible. The Owner's property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Construction Manager, Subcontractors, and Sub-subcontractors in the Project as insureds. This insurance shall include the interests of mortgagees as loss payees and shall provide coverage for direct physical loss or damage, and shall not exclude the risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, or windstorm. The insurance shall also provide coverage for ensuing loss or resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials.

§ 11.2.3 ~~Notice of Cancellation or Expiration of Owner's Required Property Insurance.~~ ~~Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by~~ **Failure to Purchase Required Property Insurance.** If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall ~~provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon~~ inform the Contractor in writing not less than ten (10) business days prior to commencement of the Work. Upon receipt of notice from the Owner, ~~shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3)~~ the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent ~~any~~ the loss to the Owner would have been covered by the insurance ~~had it not expired or been cancelled. If the Contractor purchases replacement coverage, the~~ to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by ~~an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.~~a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.4 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance

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had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

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§ 12.1.2 If a portion of the Work has been covered that the Architect 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 shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, ~~the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.~~ such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or a Separate Contractor in which event the Owner shall be responsible for payment of such costs.

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The Contract shall be governed by the law of the place where the Project is ~~located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.~~located.

§ 13.1.1 Contractor and each Subcontractor shall comply with the Illinois Human Rights Act, 775 ILCS 5/2-101 *et seq*., and Contractor and each Subcontractor hereby certifies that he / she / it has and will maintain at all times during the term of this agreement a written sexual harassment policy in accordance with 775 ILCS 5/2-105(A)(4).

§ 13.1.2 Contractor and each Subcontractor hereby certifies pursuant to Section 33E-11 of the Illinois Criminal Code that he / she / it is not barred from bidding on, or contracting in connection with, the Project as a result of a conviction for either bid-rigging or bid rotating under Section 33E-3 or 33E-4 of the Criminal Code.

§ 13.1.3 The Contractor and each Subcontractor hereby certifies that he / she / it will provide a drug free workplace in compliance Section 3 of the Drug Free Workplace Act, 30 ILCS 580/3.

§ 13.1.4 At least once per month, the Contractor and each Subcontractor shall submit to the Owner certified payrolls in accordance with Section 5 of the Illinois Prevailing Wage Act, 820 ILCS 130/5.

§ 13.1.5 Upon the Owner's request, any employee of the Contractor or any employee of any Subcontractor or vendor shall submit state-issued identification documents (e.g. driver's license, state identification card, etc.) or other documents to the Owner so that the Owner may obtain a criminal background check of the employee. No person who fails or refuses to produce such documents may work on the Project at the Project site. Alternatively, the Owner reserves the right to direct the Contractor, at any time during the Project, to immediately obtain criminal background checks of Contractor's or Subcontractor's employees to ascertain whether such employees have been convicted of any offenses. Such criminal background checks will be performed at Contractor's or Subcontractor's expense and at no additional cost to Owner. If in the Owner's sole discretion objectionable information regarding any employee is discovered in the background check, whether performed by Owner or Contractor, such person shall not be allowed to work on the Project at the Project site. The Owner may request new background checks of any employee at any time.

§ 13.1.6 This contract is subject to and shall be construed in accordance with all provisions of law applicable to the Work and the Project. ll applicable rules of law shall prevail over any conflicting provision contained in any of the Contract Documents.

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§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as ~~provided in Section 13.2.2,~~ it relates to Owner awarding contracts and assigning to Construction Manager as set forth in these Contract Documents neither party to the Contract shall assign the Contract as a whole 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.

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~~**§ 13.2.2** The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.~~

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Payments due and unpaid under the Contract Documents shall bear interest ~~from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.~~in accordance with the Local Government Prompt Payment Act, 50 ILCS 505/1, *et seq*.

...

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of ~~30~~ fourteen (14) 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:

...

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven (7) days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of ~~60~~ thirty (30) 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 important to the progress of the Work, the Contractor may, upon seven (7) additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

...

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, 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:

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A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. ~~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.~~

...

§ 15.1.3.1 Claims by either the Owner or 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 notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within ~~21~~ twenty-one (21) days after occurrence of the event giving rise to such Claim or within ~~21~~ twenty-one (21) days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

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§ 15.2.1 Claims, excluding those 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 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless

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otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within ~~30~~ thirty (30) days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten (10) days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.
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§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten (10) days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. ~~The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.~~

...

§ 15.2.6.1 Either party may, within ~~30~~ thirty (30) days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within ~~30~~ thirty (30) days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

...

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to in-person mediation as a condition precedent to binding dispute ~~resolution.~~resolution held in Scott County, Iowa.
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~~**§ 15.4 Arbitration**~~
~~**§ 15.4.1** If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.~~

~~**§ 15.4.1.1** A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a~~

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written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

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_____

(Signed)

_____

(Title)

_____

(Dated)

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SECTION 01 10 00

SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: Lincoln – Irving Addition and Renovation

B. Owner's Name: Moline Coal Valley Unit School District

C. Architect: Legat Architects, Inc.

D. Structural Engineer: IMEG.

E. Mechanical / Electrical Engineer: RTM Engineering Consulting.

F. Food Service Consultant: Clevenger Associates.

G. Civil Engineer: Martin & Whitacre

H. Construction Manager: Estes Construction.

1.02 DESCRIPTION OF WORK

A. The **Lincoln - Irving Addition and Renovation** consists of remodeling approximately 32,500 square foot of existing building to remain, removal of approximately 9,800 square foot of existing building, and construction of new construction of a 57,800 square foot addition.

B. Scope of new construction work is shown on drawings and specified in the project manual.

1.03 WORK BY OWNER

A. Items noted NIC (Not in Contract) will be supplied and installed by Owner (OFOI) after Substantial Completion. Some items include:

1. .
2.

B. Owner will supply and install the following (OFOI):

1. .
2. .

C. Owner will supply the following for installation by Contractor (OFCI):

1.

1.04 OWNER-FURNISHED ITEMS

A. Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under separate contracts.

B. The Work includes providing support systems to receive Owner's equipment, and mechanical and electrical connections.

C. The Owner will arrange and pay for delivery of Owner-furnished items in accordance with the Contractor's Construction Schedule, and will inspect deliveries for damage.

D. If Owner-furnished items are damaged, defective or missing, the Owner will arrange for replacement. The Owner will also arrange for manufacturer's field services, and the delivery of manufacturer's warranties and bonds to the Contractor.

E. The Contractor is responsible for designating the delivery dates of Owner furnished items in the Contractor's Construction Schedule and for receiving, unloading and handling Owner-furnished items at the site.

F. The Contractor is responsible for protecting Owner-furnished items from damage, including damage from exposure to the elements, and to repair or replace items damaged as a result of his operations.

1.05 OWNER OCCUPANCY

A. Owner intends to occupy the Project upon Substantial Completion.

B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

C. Schedule the Work to accommodate Owner occupancy.

1.06 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings.
   1. Locate and conduct construction activities in ways that will limit disturbance to site.

B. Arrange use of site and premises to allow:
   1. Owner occupancy.
   2. Work by Others.
   3. Work by Owner.
   4. Use of site and premises by the public.
   5. Adjacent building operations.

C. Provide access to and from site as required by law and by Owner:
   1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
   2. Do not obstruct roadways, sidewalks, or other public ways without permit.
   3. Alternative entrances, exits and Interim life safety procedures will be required if the main entrance or any fire exits are closed during construction. Coordinate durations with Owner.

D. This is a smoke and tobacco free project as required by the State of Illinois Law. Use of tobacco is strictly prohibited on project. Project Coordinator shall coordinate enforcement efforts.

E. Contractor shall not staff Registered Sex Offenders on site whether performing general, subcontract or any other form of work.

1.07 WORK SEQUENCE

A. Contract Time: All phases of the Work shall be completed as indicated in Bid Schedule.

B. Coordinate construction schedule and operations with Owner.

C. Coordinate work of the various Sections of Specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items installed later.

D. Verify characteristics of elements of interrelated operating equipment are compatible; coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

E. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduits, as closely as practicable; make runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

F. Execute cutting and patching to integrate elements of Work, uncover ill-timed, defective, and non-conforming Work, provide openings for penetrations of existing surfaces, and provide samples for testing if required. Seal penetrations through floors, walls, and roof.

1.08 DEFINITIONS AND EXPLANATIONS

A. Imperative language is used generally in the specifications. Except as otherwise indicated, requirements expressed imperatively are to be performed by the Contractor as if preceded by the phrase “The Contractor shall”.

B. The term “provide” means furnish and install, complete, and ready for intended use. Except as

otherwise defined in greater detail, the term “furnish” means supply and deliver to the project site, including unloading, unpacking, inspecting, and storing until ready for receipt by Owner, installation, etc., as applicable.

C. Except as otherwise defined in greater detail, the term “install” is used to describe operations at project site including assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations, as applicable.

D. The term “indicated” is as cross-reference to graphics, notes or schedules on drawings, to other paragraphs or schedules in the specifications, and to similar means of recording requirements in contract documents. Where terms such as “shows”, “noted”, “schedules”, and “specified” are used in lieu of “indicated”, it is for purpose of helping reader locate cross-reference, and no limitations of location is intended.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 12 13 – SUMMARY OF MULTIPLE CONTRACTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. A summary of each contract, including responsibilities for coordination, temporary facilities and controls.

B. Specific requirements of each contract are also indicated in individual specification sections and on drawings.

1.02 RELATED REQUIREMENTS

A. Section 01 10 00 – Summary

B. Section 01 25 00 – Substitution Procedures

C. Section 01 26 00 – Contract Modification Procedures

D. Section 01 29 00 – Payment Procedures

E. Section 01 40 00 – Quality Requirements

F. Section 01 41 00 – Regulatory Requirements

G. Section 01 45 33 – Code-Required Special Inspections and Procedures

H. Section 01 50 00 – Temporary Facilities and Controls

I. Section 01 60 00 – Project Requirements

J. Section 01 77 00 – Execution and Closeout Procedures

K. Section 01 78 00 – Closeout Submittals

L. Section 01 79 00 – Demonstration and Training

1.03 DEFINITIONS

A. Permanent Enclosure: As determined by the Construction Manager, permanent or temporary roofing is complete, insulated, and weather-tight; exterior walls are insulated and weather-tight; and openings are closed with permanent construction or temporary closures.

1.04 COORDINATION

A. Project Coordinator shall be responsible for coordination between the various construction contracts.

1. Construction Manager shall act as Project Coordinator.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 CONSTRUCTION MANAGER

A. Construction Manager (CM): Full-time Construction Manager shall be experienced in administration and supervision of building construction, including mechanical and electrical work.

B. Coordination activities of Construction Manager include, but are not limited to, the following:

1. Coordinate shared access to workspaces.
2. Coordinate product selections for compatibility.
3. Provide overall coordination of temporary facilities and controls.
4. Coordinate, schedule, and approve interruptions of permanent and temporary utilities, including those necessary to make connections for temporary services.
5. Coordinate construction and operations of the work with work performed by each contract.
6. Coordinate sequencing and scheduling of the Work. Include the following:
   a. Initial Coordination Meeting: At earliest possible date, arrange and conduct a meeting with separate contractors for sequencing and coordinating the Work; negotiate reasonable adjustments to schedules.

b. Prepare a combined contractor's construction schedule for entire project. Base schedule on preliminary construction schedule. Secure time commitments for performing critical construction activities from separate contractors. Prepare a simplified summary sheet indicating combined construction activities of contracts.
c. Distribute copies of schedules to Architect, Owner, and separate contractors.

7. Apply and provide the building permit for the Project. All other permits and fees are the responsibility of each contractor as required by work of the contract.
8. Provide photographic documentation.
9. Coordinate quality-assurance and quality control services specified in Division 01 - General Requirements.
10. Coordinate sequence of activities to accommodate tests and inspections, and coordinate schedule of tests and inspections.
11. Provide information necessary to adjust, move or relocate existing utility structures affected by construction.
12. Locate existing permanent benchmarks, control points, and similar reference points, and establish permanent benchmarks on project site.
13. Coordinate field surveys of in-progress construction and site work, and final property survey.
14. Coordinate completion of interrelated punch list items.
15. Coordinate preparation of project record documents if information from more than one contractor is to be integrated with information from other contractors to form one combined record.
16. Print and submit record transparencies if installations by more than one contractor are indicated on the same contract drawing or shop drawing.
17. Collect record specification sections from other contractors, collate sections into numeric order, and submit complete set.
18. Coordinate preparation of operation and maintenance manuals if information from more than one contractor is to be integrated with information from other contractors to form one combined record.

C. Responsibilities of Construction Manager for Section 01 5000 - Temporary Facilities and Controls include, but are not limited to, the following:
1. Provide a field office with meeting room facilities for project meetings, including phone and computer services for use by the Owner, Architect and their consultants, and CM. Each Contractor shall be responsible to provide temporary offices, services, and utilities to their offices as required by work of the contract.
2. Provide the project identification sign specified.
3. Coordinate protection of the work. Each contractor is responsible to provide protection of their completed work.

3.02 GENERAL REQUIREMENTS OF CONTRACTS

A. Extent of Contract: Unless the agreement contains a more specific description of the work, names and terminology on drawings and in specification sections determine which contract includes a specific element of project.

B. Unless otherwise indicated, the Work described in this Section for each contract shall be complete systems and assemblies, including products, components, accessories, and installation required by the contract documents.

C. Local custom and trade union jurisdictional settlements do not control the scope of the work of each contract. When a potential jurisdictional dispute or similar interruption of work is first identified or threatened, affected contractors shall negotiate a reasonable settlement to avoid or minimize interruption and delays.

D. Each contractor for its own work shall provide all surveying, layout and staking, as required, to complete the work of the contract.

E. Each Contractor for its own Work shall provide trenches, excavation, backfill and compaction for the work of the contract.

F. Each contractor for its own work shall provide cutting, sealing and patching as required.

G. Each contractor for its own work shall provide firestopping as required.

H. Each contractor is required to coordinate its own work with that of all other contractors to insure the work is performed in the most efficient and timely manner.

I. Each contractors to utilize Procore for electronic document management, daily Job Hazard Analysis forms turned in via Procore, Hot Work Permits as required, hard hats, safety glasses and OSHA minimum safety equipment at all times.

J. Within ten (10) working days after preliminary construction schedule submittal has been received from CM, submit a matching schedule showing construction operations sequenced and coordinated with overall construction. Provide detailed breakdown of the preliminary schedule showing sequencing, critical path, specific locations, etc.

K. Substitutions: Each contractor shall cooperate with other contractors involved to coordinate approved substitutions with remainder of the Work.

L. Section 01 5000 - Temporary Facilities and Controls: In addition to specific responsibilities for temporary facilities and controls indicated in this Section and in Division 01 General Requirements, each contractor is responsible for the following:
   2. Installation, operation, maintenance, and removal of each temporary facility usually considered as its own normal construction activity, including costs and use charges associated with each facility.
   3. Plug-in electric power cords and extension cords, supplementary plug-in task lighting, and special lighting necessary for its own activities.
   4. Its own field office complete with necessary furniture and utilities, if required.
   5. Its own storage and fabrication sheds.
   6. Temporary enclosures for its own construction activities.
   7. General hoisting equipment for its own construction activities.
   8. Progress cleaning of its own work areas on a daily basis. Removal of construction debris to containers provided by the each Prime Contract, or removed by other means from the site, and disposed of legally. Accumulated piles of debris shall not be allowed.
   9. Secure lockup of its own tools, materials, and equipment.
   10. Construction aids, miscellaneous services and facilities necessary exclusively for its own construction activities.
   11. Protection of the work. Repair costs for damages of the work caused by the contractor.
   12. Provide specialized fire protection equipment and/or personnel required to perform the work as required by O.S.H.A. safety procedures and directions.
   13. Temporary Water Service: The existing water service shall be used for temporary water. Each Contractor shall provide connections, extensions, hoses, etc. as necessary to deliver water from the service source. The Owner shall pay utility-use charges for water during construction.
   14. Electric Power Service: The Owner shall pay utility-use charges for electricity during construction. Electrical contract will provide for all trades, see Summary of Multiple Contracts Bid Package L for additional information.
   15. Each contractor is responsible to provide for their own forces all temporary facilities and controls required including, but not limited to, first aid facilities, temporary fire protection equipment, temporary enclosures, barriers and fences, construction aids, temporary roads, access, lay down areas, and potable water as may be required to properly complete the Work contracted. The contractor shall remove temporary facilities and controls upon completion of the work, or when no longer required.

M. Each contractor shall comply with all Owner and CM safety policies and requirements. Each contractor is responsible to comply with all OSHA regulations, and to maintain a safe work environment at all times. A clean, organized, and safe jobsite is of the highest priority. Each contractor shall be required to clean their work area a minimum of daily, organize all materials, tools and equipment, and maintain safe working conditions in compliance with regulatory codes at all times.

N. Each contractor is responsible for the requirements set forth in Division 00 – Procurement and Contracting Requirements, and Division 01 - General Requirements. This includes coordination

with the CM and other prime contracts, scheduling, project meeting representation, quality control, and other requirements specified.

O. Record Documents/Project Close-out Procedures:
   1. Prepare project record documents, record changes (as-built documents), and provide complete sets to CM.
   2. Print and submit record transparencies for contract drawings and/or shop drawings.
   3. Collect record specification sections, collate sections into numeric order, and submit complete sets.
   4. Prepare operation and maintenance manuals to be integrated to form one combined record.
   5. Comply with all other requirements as applicable to the contract and specified in section 01 7800 - Closeout Submittals.

3.03 BID PACKAGE A - GENERAL TRADES CONTRACT

A. Work of this Contract includes, but is not limited to, the following:
   1. Section 02 41 00 - Demolition. Provide this section complete. Except floor cutting, removal, and replacement for plumbing and electrical will be by those Bid Packages not Bid Package A. Sawcutting, removal, patching, and new lintels for HVAC ducts thru existing walls will be by Bid Package K.
      Bid Package A to include structural shoring for all demolition at load bearing elements complete. Include stamped engineered shoring drawings, and maintain shoring until permanent structural elements are in place.
      Building demolition of existing gym, cafeteria, administration areas as noted on Civil Drawings will be by Bid Package M.
      Section 03 54 00 – Cast Underlayment. Provide this section complete.
   2. Section 06 10 00 – Rough Carpentry. Provide this section complete. Includes blocking and backing for all wall mounted items including but not limited to casework, toilet and bath accessories, partitions, wall bumpers, visual displays, and TVs.
   3. Section 06 20 00 – Finish Carpentry. Provide this section complete.
   4. Section 06 41 00 –Architectural Wood Casework. Provide this section complete.
   5. Section 06 83 16 – Fiberglass Reinforced Paneling. Provide this section complete.
   6. Section 07 21 00 – Thermal Insulation. Provide this section complete for work by this contract.
   7. Section 07 42 13.23 – Metal Composite Material Wall Panels. Provide this section complete. Includes all sub-framing and insulation behind the panels for a complete system.
   8. Section 07 84 00 – Firestopping. Provide this section complete for work of this contract.
   9. Section 07 92 00 – Joint Sealants. Provide this section complete for work of this contract. Including but not limited to, hollow metal frames, casework, countertops, window sills, fire extinguisher cabinets and electrical panels exposed to view.
   10. Section 07 95 13 – Expansion Joint Cover Assemblies. Provide this section complete for exterior assemblies. Bid Package H to include all interior assemblies as part of their systems.
   11. Section 08 11 13 – Hollow Metal Doors and Frames. Provide this section complete.
   12. Section 08 14 16 – Flush Wood Doors. Provide this section complete.
   13. Section 08 31 00 – Access Doors and Panels. Provide this section complete for those not supplied by Bid Packages J, K, or L.
   14. Section 08 33 23 – Overhead Coiling Doors. Provide this section complete.
   15. Section 08 36 13 – Sectional Doors. Provide this section complete.
   16. Section 08 71 00 – Door Hardware. Provide this section complete. Include providing aluminum door hardware, but aluminum door hardware to be installed by Bid Package G.
   17. Section 09 05 61 – Common Work Results for Flooring Preparation. Provide this section complete.
   18. Section 09 30 00 – Tiling. Provide this section complete.
   19. Section 09 65 00 – Resilient Floorings. Provide this section complete.
   20. Section 09 65 66 – Resilient Athletic Flooring. Provide this section complete.

21. Section 09 67 00 – Fluid Applied Flooring. Provide this section complete.
22. Section 09 68 13 – Tile Carpeting. Provide this section complete.
23. Section 10 11 00 – Visual Display Units. Provide this section complete.
24. Section 10 12 00 – Display Cases. Provide this section complete.
25. Section 10 14 16 – Plaques. Provide this section complete.
26. Section 10 14 19 – Dimensional Letter Signage. Provide this section complete.
27. Section 10 14 23 – Panel Signage. Provide this section complete.
28. Section 10 21 23 – Cubicle Curtains and Track . Provide this section complete.
29. Section 10 22 39 – Folding Panel Partitions. Provide this section complete.
30. Section 10 26 00 – Wall and Door Protection. Provide this section complete.
31. Section 10 28 00 – Toilet and Bath Accessories. Provide this section complete.
32. Section 10 43 00 – Emergency Aid Specialties. Provide this section complete.
33. Section 10 44 00 – Fire Protection Specialties. Provide this section complete.
34. Section 10 75 00 – Flagpoles. Provide this section complete.
35. Section 11 61 43 – Stage Curtains. Provide this section complete.
36. Section 11 66 23 – Gymnasium Equipment. Provide this section complete.
37. Section 12 24 00 – Window Shades. Provide this section complete.
38. Section 12 36 00 – Countertops. Provide this section complete.
39. Section 14 21 00 – Electric Traction Elevators. Provide this section complete.
40. Section 32 18 10 – Poured-In-Place Rubberized Surface for Playground Area. Provide this section complete for Alternate No. 2.
41. Section 32 18 10.10 – Synthetic Turf System. Provide this section complete for Alternate No. 1.
42. Section 32 18 13 – Synthetic Grass Surfacing. Provide this section complete for Alternate No. 1.
43. Section 32 31 13 – Chain Link Fencing. Provide this section complete.
44. Section 32 33 00 – Site Furnishings. Provide this section complete.
45. Section 32 33 13 – Site Bicycle Racks. Provide this section complete.
46. Section 32 92 19 – Seeding. Provide this section complete.
47. Section 32 93 00 – Plants. Provide this section complete.
48. Include final cleaning of building prior to owner turn over.
49. Power supplies for openings in this contract are to be furnished by this contract and installed by Electrical Contract.
50. Provide an allowance of $50,000 to provide and install temporary enclosures to make building suitable for temporary heat and protection. Remove temporary enclosures at completion of use. The Contractor shall submit a detailed breakdown and document all costs charged to the allowance, which must receive prior approval by the CM. No additional markup will be allowed. Any unused portion of the allowance shall be credited back to the owner by change order at the completion of the work.
51. Provide labor for project clean-up to be used at the discretion of the Construction Manager. Include 450 man hours for clean-up.
52. Provide full time supervision when work of this package is occurring on site.
53. Alternates 1, 2, and 5 are affected by this bid package. Reference section Alternates 01 23 00.

B. Temporary facilities and controls in this Contract include, but are not limited to, the following:
   1. Division 01 - Submittal Procedures and Division 01-General Requirements as it relates to work of this contract.
   2. Section 01 5000- Temporary Facilities and Controls:
      a. Barriers: Provide temporary construction fencing and gates at staging area if needed by work of this contract.
      b. Exterior Enclosures: Provide temporary weather protection and temporary enclosures for all instances where interior spaces will be exposed to outdoors. Provide temporary doors at entrances prior to installation of permanent doors. Protections to remain in place until removal is directed by the Construction Manager.

c. Security: Maintain secure enclosures at exterior and interior openings until permanent products are placed.
d. Provide daily clean-up for your work, or Construction Manager may perform the work and deduct the cost from the payments due to contractor. Daily clean-up shall include removal of all small trash associated with Contractor's work. Daily clean-up includes broom cleaning areas required to maintain a clean work area.

3. Provide a broom clean condition in all areas of work.
4. Provide surveying and layout required to complete work of this contract.
5. Provide all temporary construction and construction aids as required for completion of the work. Remove temporary construction upon completion of the work.
6. Provide delivery, unloading and storage at site of all materials as part of this contract.
7. Provide temporary protection of existing finishes during work of this contract. Remove temporary protection upon completion of the work.
8. Provide scaffolding, temporary enclosures, and other temporary facilities required to complete work of this contract. Remove all temporary construction upon completion.
9. Provide barriers, barricades, traffic control and other temporary control measures as required to complete work of this contract that comply with O.S.H.A.
10. Clean-up by Contractor shall be daily, or Construction Manager may perform the work and deduct the cost from the payments due to contractor. Daily clean-up shall include removal of all small trash associated with Contractor's work. Daily clean-up includes broom cleaning areas required to maintain a clean work area.
11. Provide delivery, unloading, and storage of all materials as part of this contract. If materials are stored within the building, all material must be stored on mobile carts to allow for relocation at all times. If material cannot be stored on mobile carts, it must be delivered to the jobsite immediately prior to installation to avoid impacting other trades
12. If scope of work assignments made in Bid Packages conflict with notes on drawings, the bid package language will govern responsibility.

3.04 BID PACKAGE B - CONCRETE CONTRACT

A. Work of this Contract includes, but is not limited to, the following:
1. Section 03 01 00 – Maintenance of Concrete. Provide this section complete.
2. Section 03 05 16 – Underslab Vapor Barrier Stego. Provide this section complete.
3. Section 03 10 00 – Concrete Formwork. Provide this section complete.
4. Section 03 20 00 – Concrete Reinforcing. Provide this section complete.
5. Section 03 30 00 – Cast-In-Place Concrete. Provide this section complete.
6. Section 07 13 00– Sheet Waterproofing. Provide this section complete.
7. Section 07 21 00 – Thermal Insulation. Provide this section complete as applies to this scope of work.
8. Section 07 92 00 – Joint Sealants. Provide this section complete for work of this contract.
9. Section 31 23 00 – Foundation Excavation and Backfill. Provide this section complete.
10. Section 31 26 00 – Steel Helical Piles. Provide this section complete.
11. Section 32 11 23 – Aggregate Base Courses. Provide this section complete.
12. Section 32 12 16 – Asphalt Paving. Provide this section complete.
13. Section 32 13 13 – Concrete Paving. Provide this section complete.
14. Section 32 16 23 – Sidewalks. Provide this section complete.
15. Section 32 17 23 – Pavement Markings. Provide this section complete.
16. Section 32 17 26 – Tactile Warning Surface. Provide this section complete.
17. Include GeoFoam/Structural Insulation Fill under slabs on grade/stairs inside the building complete.
18. Include installation of all embedded items provided by Bid Package C and E.
19. Provide cutting/patching/replacement of all sidewalks, asphalt paving, concrete paving or any other hard surfaces needed to complete work of this contract.
20. All compacted aggregate base under slabs on grade, sidewalks and paving to provided and installed by Concrete Contract.
21. Provide and install parking signs, posts, flagpoles foundations complete. Flagpole provided and installed by Bid Package A.

22. Provide all joint sealants as required for work of this contract.
23. Provide installation of anchor bolts and items embedded in concrete, bolts provided by others.
24. Provide grouting of base plates complete.
25. Provide perimeter foundation insulation complete at perimeter of building.
26. Provide cutting/patching/replacement of all sidewalks, asphalt paving, concrete paving or any other hard surfaces needed to complete work of this contract.
27. Provide compacted aggregate base under slabs on grade, sidewalks and paving.
28. Provide installation of sleeves thru foundations for utility work, sleeves provided by others.
29. Provide Moisture Vapor Reduction Admixture (MVRA) in the interior slab on grade mix design. Product: Barrier One or approved equal.
30. Remove all spoils from excavations from site.
31. Alternates 1, 2, and 3 are affected by this bid package. Reference section Alternates 01 23 00.

B. Temporary facilities and controls in this Contract include, but are not limited to, the following:
1. Division 01 - Submittal Procedures and Division 01-General Requirements as it relates to work of this contract.
2. Section 01 5000- Temporary Facilities and Controls:
   a. Barriers: Provide temporary construction fencing and gates at staging area if needed by work of this contract.
   b. Security: Maintain secure enclosures at exterior and interior openings until permanent products are placed.
   c. Waste Removal: Provide waste removal facilities and services for use by this contractor.
   d. Sanitary Conveniences: Provide services for this contractor for duration of project.
   e. Dewatering: Provide complete any kind as needed for work of this contract.
   f. Street Cleaning: Provide complete on a daily basis as needed for work of this contract.
   g. Provide winter services/conditions as required to complete work of this contract.
   h. Provide daily clean-up for your work, or Construction Manager may perform the work and deduct the cost from the payments due to contractor. Daily clean-up shall include removal of all small trash associated with Contractor's work. Daily clean-up includes broom cleaning areas required to maintain a clean work area.
3. Provide a broom clean condition in all areas of work.
4. Provide surveying and layout required to complete work of this contract.
5. Provide all temporary construction and construction aids as required for completion of the work. Remove temporary construction upon completion of the work.
6. Provide delivery, unloading and storage at site of all materials as part of this contract.
7. Provide temporary protection of existing finishes during work of this contract. Remove temporary protection upon completion of the work.
8. Provide scaffolding, temporary enclosures, and other temporary facilities required to complete work of this contract. Remove all temporary construction upon completion.
9. Provide barriers, barricades, traffic control and other temporary control measures as required to complete work of this contract that comply with O.S.H.A., City of Moline, and State of Illinois.
10. If scope of work assignments made in Bid Packages conflict with notes on drawings, the bid package language will govern responsibility.

3.05 BID PACKAGE C – PRECAST CONTRACT

A. Work of this Contract includes, but is not limited to, the following:
1. Section 03 41 00 – Precast Structural Concrete. Provide this section complete. Includes erection complete.
2. Section 07 21 00 – Thermal Insulation. Provide this section complete as applies to this scope of work.
3. Section 07 92 00 – Joint Sealants. Provide this section complete for work of this contract.

4. Include grouting and joint sealants for precast concrete for complete installation.
5. Include providing all steel embedded items for installation by Bid Package B.
6. Provide and install all grout, deadmen, bracing, shoring and all work for complete installation.
7. Concrete topping over roof precast by Bid Package B.
8. This project has been designed using Revit. The Revit model will be available for contractor use after bid day. The Precast Concrete, Steel Fabrication, Fire Suppression, Mechanical and Electrical contractors will all be required to input their related trade information into the model. Clash detection shall be the responsibility of the Mechanical contractor on a weekly basis. All above mentioned trades (other than Precast/Steel) shall be available for these weekly meetings in person or via conference call until all clashes have been resolved. Refer to specification section 01 31 13 BIM Coordination Process.

B. Temporary facilities and controls in this Contract include, but are not limited to, the following:
   1. Division 01 - Submittal Procedures and Division 01-General Requirements as it relates to work of this contract.
   2. Section 01 5000- Temporary Facilities and Controls:
      a. Barriers: Provide temporary construction fencing and gates at staging area if needed by work of this contract.
      b. Security: Maintain secure enclosures at exterior and interior openings until permanent products are placed.
      c. Waste Removal: Provide waste removal facilities and services for use by this contractor.
      d. Sanitary Conveniences: Provide services for this contractor for duration of project.
      e. Dewatering: Provide complete any kind as needed for work of this contract.
      f. Street Cleaning: Provide complete on a daily basis as needed for work of this contract.
      g. Provide winter services/conditions as required to complete work of this contract.
      h. Provide daily clean-up for your work, or Construction Manager may perform the work and deduct the cost from the payments due to contractor. Daily clean-up shall include removal of all small trash associated with Contractor's work. Daily clean-up includes broom cleaning areas required to maintain a clean work area.
   3. Provide a broom clean condition in all areas of work.
   4. Provide surveying and layout required to complete work of this contract.
   5. Provide all temporary construction and construction aids as required for completion of the work. Remove temporary construction upon completion of the work.
   6. Provide delivery, unloading and storage at site of all materials as part of this contract.
   7. Provide temporary protection of existing finishes during work of this contract. Remove temporary protection upon completion of the work.
   8. Provide scaffolding, temporary enclosures, and other temporary facilities required to complete work of this contract. Remove all temporary construction upon completion.
   9. Provide barriers, barricades, traffic control and other temporary control measures as required to complete work of this contract that comply with O.S.H.A.
   10. If scope of work assignments made in Bid Packages conflict with notes on drawings, the bid package language will govern responsibility.

3.06 BID PACKAGE D - MASONRY CONTRACT

A. Work of this Contract includes, but is not limited to, the following:
   1. Section 04 01 00 – Maintenance of Masonry. Provide this section complete.
   2. Section 04 05 11 – Masonry Mortaring and Grouting. Provide this section complete.
   3. Section 04 20 00 – Unit Masonry. Provide this section complete.
   4. Section 04 22 00 – Reinforced Unit Masonry. Provide this section complete. Include providing reinforcing steel complete.
   5. Section 04 23 13 – Masonry Veneer. Provide this section complete.
   6. Section 07 21 00 – Thermal Insulation. Provide this section complete as applies to this scope of work.

7. Section 07 92 00 – Joint Sealants. Provide this section complete for work of this contract.
8. Include setting of all lintels and embedded steel bearing on/in masonry. Steel provided by Bid Package E.
9. Include providing and installing all reinforcing steel in this masonry contract.

B. Temporary facilities and controls in this Contract include, but are not limited to, the following:
1. Division 01 - Submittal Procedures and Division 01-General Requirements as it relates to work of this contract.
2. Section 01 5000- Temporary Facilities and Controls:
   a. Barriers: Provide temporary construction fencing and gates at staging area if needed by work of this contract.
   b. Security: Maintain secure enclosures at exterior and interior openings until permanent products are placed.
   c. Waste Removal: Provide waste removal facilities and services for use by this contractor.
   d. Sanitary Conveniences: Provide services for this contractor for duration of project.
   e. Dewatering: Provide complete any kind as needed for work of this contract.
   f. Street Cleaning: Provide complete on a daily basis as needed for work of this contract.
   g. Provide winter services/conditions as required to complete work of this contract.
   h. Provide daily clean-up for your work, or Construction Manager may perform the work and deduct the cost from the payments due to contractor. Daily clean-up shall include removal of all small trash associated with Contractor's work. Daily clean-up includes broom cleaning areas required to maintain a clean work area.
3. Provide a broom clean condition in all areas of work.
4. Provide surveying and layout required to complete work of this contract.
5. Provide all temporary construction and construction aids as required for completion of the work. Remove temporary construction upon completion of the work.
6. Provide delivery, unloading and storage at site of all materials as part of this contract.
7. Provide temporary protection of existing finishes during work of this contract. Remove temporary protection upon completion of the work.
8. Maintain rut free site from your equipment needed for the work, on a daily basis.
9. Provide scaffolding, temporary enclosures, and other temporary facilities required to complete work of this contract. Remove all temporary construction upon completion.
10. Provide barriers, barricades, traffic control and other temporary control measures as required to complete work of this contract that comply with O.S.H.A.
11. If scope of work assignments made in Bid Packages conflict with notes on drawings, the bid package language will govern responsibility.

3.07 BID PACKAGE E – STEEL CONTRACT

A. Work of this Contract includes, but is not limited to, the following:
1. Section 05 12 23 – Structural Steel. Provide this section complete.
2. Section 05 21 00 – Steel Joists. Provide this section complete.
3. Section 05 31 00 – Steel Deck. Provide this section complete.
4. Section 05 50 00 – Metal Fabrications. Provide this section complete.
5. Section 05 51 00 – Metal Stairs. Provide this section complete.
6. Section 05 52 13 – Pipe and Tube Railings. Provide this section complete.
7. Section 05 73 00 – Decorative Metal Railings. Provide this section complete.
8. Include erection of all items above complete.
9. Include dismantling and remove for salvage existing steel structure on roof that supports the existing mechanical equipment. Salvage structure, remove from site and store off-site in an insured location until needing to be reset on new structure. Provide labor, materials, equipment to reset and reinstall structure on new roof structure where indicated. See supplemental drawings.
10. This project has been designed using Revit. The Revit model will be available for contractor use after bid day. The Precast Concrete, Steel Fabrication, Fire Suppression, Mechanical and Electrical contractors will all be required to input their related trade information into the model. Clash detection shall be the responsibility of the Mechanical

contractor on a weekly basis. All above mentioned trades (other than Precast/Steel) shall be available for these weekly meetings in person or via conference call until all clashes have been resolved. Refer to specification section 01 31 13 BIM Coordination Process.

B. Temporary facilities and controls in this Contract include, but are not limited to, the following:
   1. Division 01 - Submittal Procedures and Division 01-General Requirements as it relates to work of this contract.
   2. Section 01 5000- Temporary Facilities and Controls:
      a. Barriers: Provide temporary construction fencing and gates at staging area if needed by work of this contract.
      b. Security: Maintain secure enclosures at exterior and interior openings until permanent products are placed.
      c. Waste Removal: Provide waste removal facilities and services for use by this contractor.
      d. Street Cleaning: Provide complete on a daily basis as needed for work of this contract.
      e. Provide winter services/conditions as required to complete work of this contract.
      f. Provide daily clean-up for your work, or Construction Manager may perform the work and deduct the cost from the payments due to contractor. Daily clean-up shall include removal of all small trash associated with Contractor's work. Daily clean-up includes broom cleaning areas required to maintain a clean work area.
   3. Provide a broom clean condition in all areas of work.
   4. Provide surveying and layout required to complete work of this contract.
   5. Provide all temporary construction and construction aids as required for completion of the work. Remove temporary construction upon completion of the work.
   6. Provide delivery, unloading and storage at site of all materials as part of this contract.
   7. Provide temporary protection of existing finishes during work of this contract. Remove temporary protection upon completion of the work.
   8. Provide scaffolding, temporary enclosures, and other temporary facilities required to complete work of this contract. Remove all temporary construction upon completion.
   9. Provide barriers, barricades, traffic control and other temporary control measures as required to complete work of this contract that comply with O.S.H.A.
   10. Provide pick plans and crane coordination prior to any work on-site.
   11. If scope of work assignments made in Bid Packages conflict with notes on drawings, the bid package language will govern responsibility.

3.08 BID PACKAGE F - ROOFING AND SHEET METAL CONTRACT

A. Work of this Contract includes, but is not limited to, the following:
   1. Section 07 01 50.19 – Preparation for Re-Roofing. Provide this section complete
   1. Section 07 21 00 – Thermal Insulation. Provide this section complete for work by this contract behind and under all sheet metal and roofing.
   2. Section 07 53 10 – Single Ply Roofing Fully Adhered EPDM. Provide this section complete.
   3. Section 07 62 00 – Sheet Metal Flashing and Trim. Provide this section complete. Except any sheet metal that touches the Metal Composite Material Wall Panels to be provided by Bid Package A to match the Wall Panels
   4. Section 07 72 00 - Roof Accessories. Provide this section complete.
   5. Section 07 76 00 – Roof Pavers. Provide this section complete.
   6. Section 07 84 13 – Penetration Firestopping. Provide this section complete for work of this section
   7. Section 07 92 00 – Joint Sealants. Provide this section complete for work of this contract.
   8. Section 07 95 13 – Expansion Joint Cover Assemblies. Provide this section complete for any roof expansion joints as required.
   9. Provide roof patching and flashing for new mechanical and electrical equipment and openings and electrical equipment and penetrations at existing building roof.

B. Temporary facilities and controls in this Contract include, but are not limited to, the following:

1. Division 01 - Submittal Procedures and Division 01-General Requirements as it relates to work of this contract.
2. Section 01 5000- Temporary Facilities and Controls:
    a. Barriers: Provide temporary construction fencing and gates at staging area if needed by work of this contract.
    b. Exterior Enclosures: Provide temporary weather protection and temporary enclosures for all instances where interior spaces will be exposed to outdoors. Protections to remain in place until removal is directed by the Construction Manager.
    c. Security: Maintain secure enclosures at exterior and interior openings until permanent products are placed.
    d. Provide daily clean-up for your work, or Construction Manager may perform the work and deduct the cost from the payments due to contractor. Daily clean-up shall include removal of all small trash associated with Contractor's work. Daily clean-up includes broom cleaning areas required to maintain a clean work area.
    e. Dewatering: Provide complete any kind as needed for work of this contract.
    f. Street Cleaning: Provide complete on a daily basis as needed for work of this contract.
3. Provide a broom clean condition in all areas of work.
4. Provide surveying and layout required to complete work of this contract.
5. Provide all temporary construction and construction aids as required for completion of the work. Remove temporary construction upon completion of the work.
6. Provide delivery, unloading and storage at site of all materials as part of this contract.
7. Provide temporary protection of existing finishes during work of this contract. Remove temporary protection upon completion of the work.
8. Provide scaffolding, temporary enclosures, and other temporary facilities required to complete work of this contract. Remove all temporary construction upon completion.
9. Provide barriers, barricades, traffic control and other temporary control measures as required to complete work of this contract that comply with O.S.H.A.
10. Clean-up by Contractor shall be daily, or Construction Manager may perform the work and deduct the cost from the payments due to contractor. Daily clean-up shall include removal of all small trash associated with Contractor's work. Daily clean-up includes broom cleaning areas required to maintain a clean work area.
11. Provide delivery, unloading, and storage of all materials as part of this contract. If materials are stored within the building, all material must be stored on mobile carts to allow for relocation at all times. If material cannot be stored on mobile carts, it must be delivered to the jobsite immediately prior to installation to avoid impacting other trades
12. If scope of work assignments made in Bid Packages conflict with notes on drawings, the bid package language will govern responsibility.

3.09 BID PACKAGE G – STOREFRONTS AND CURTAIN WALLS CONTRACT

A. Work of this Contract includes, but is not limited to, the following:
1. Section 07 92 00 – Joint Sealants. Provide this section complete for work of this contract.
2. Section 08 32 00 – Sliding Glass Doors. Provide this section complete.
3. Section 08 41 26 – All-Glass Entrances and Storefronts. Provide this section complete.
4. Section 08 43 13 – Aluminum-Framed Storefronts. Provide this section complete.
5. Section 08 44 13 – Glazed Aluminum Curtain Walls Provide this section.
6. Section 08 71 00 – Door Hardware. Provide installation only for materials in this section complete. Hardware provided by Bid Package A.
7. Section 08 80 00 – Glazing. Provide this section complete.
8. Section 08 87 23 – Safety and Security Films. Provide this section complete.
9. Alternate No. 4 is affected by this bid package. See Alternates section 01 23 00.

B. Temporary facilities and controls in this Contract include, but are not limited to, the following:
1. Division 01 - Submittal Procedures and Division 01-General Requirements as it relates to work of this contract.
2. Section 01 5000- Temporary Facilities and Controls:

a. Barriers: Provide temporary construction fencing and gates at staging area if needed by work of this contract.
b. Exterior Enclosures: Provide temporary weather protection and temporary enclosures for all instances where interior spaces will be exposed to outdoors. Protections to remain in place until removal is directed by the Construction Manager.
c. Security: Maintain secure enclosures at exterior and interior openings until permanent products are placed.
d. Provide daily clean-up for your work, or Construction Manager may perform the work and deduct the cost from the payments due to contractor. Daily clean-up shall include removal of all small trash associated with Contractor's work. Daily clean-up includes broom cleaning areas required to maintain a clean work area.
e. Dewatering: Provide complete any kind as needed for work of this contract.
f. Street Cleaning: Provide complete on a daily basis as needed for work of this contract.

3. Provide Water Spray Test: After completing the installation of exterior openings, Contractor shall test systems for water penetration according to AAMA 501.2 in locations as directed by CM. The locations to be tested shall include critical interface conditions. The test will be the responsibility of the Contractor. Costs associated with any subsequent testing due to failures shall be borne by the Contractor. Testing shall be witnessed and verified by the Construction Manager. Repair or remove work that does not meet the specified requirements. There shall be two testing locations per each opening type. Photos and documentation shall be submitted with the closeout documents before final payment.
4. Provide a broom clean condition in all areas of work.
5. Provide surveying and layout required to complete work of this contract.
6. Provide all temporary construction and construction aids as required for completion of the work. Remove temporary construction upon completion of the work.
7. Provide delivery, unloading and storage at site of all materials as part of this contract.
8. Provide temporary protection of existing finishes during work of this contract. Remove temporary protection upon completion of the work.
9. Provide scaffolding, temporary enclosures, and other temporary facilities required to complete work of this contract. Remove all temporary construction upon completion.
10. Provide barriers, barricades, traffic control and other temporary control measures as required to complete work of this contract that comply with O.S.H.A.
11. Clean-up by Contractor shall be daily, or Construction Manager may perform the work and deduct the cost from the payments due to contractor. Daily clean-up shall include removal of all small trash associated with Contractor's work. Daily clean-up includes broom cleaning areas required to maintain a clean work area.
12. Provide delivery, unloading, and storage of all materials as part of this contract. If materials are stored within the building, all material must be stored on mobile carts to allow for relocation at all times. If material cannot be stored on mobile carts, it must be delivered to the jobsite immediately prior to installation to avoid impacting other trades
13. If scope of work assignments made in Bid Packages conflict with notes on drawings, the bid package language will govern responsibility.

3.10 BID PACKAGE H – STUDS, DRYWALL, ACOUSTICAL, PAINTING CONTRACT

A. Work of this Contract includes, but is not limited to, the following:

1. Section 05 40 00 – Cold Formed Metal Framing. Provide this section complete. This bid package to provide and install the Dens Glass Exterior Sheathing complete.
2. Section 07 21 00 – Thermal Insulation. Provide this section complete for work by this contract.
3. Section 07 21 19 – Foamed-In-Place Insulation. Provide this section complete.
4. Section 07 25 00 – Weather Barriers. Provide this section complete on ALL stud and masonry exterior walls for a complete building system.
5. Section 07 26 00 – Vapor Retarders. Provide this section complete.
6. Section 07 84 00 –Firestopping. Provide this section complete as required by this contract.

7. Section 07 92 00 – Joint Sealants. Provide this section complete for work of this contract. Also include all finish caulking at HM/Aluminum frames to gypsum assemblies.
8. Section 07 95 13 – Expansion Joint cover Assemblies. Provide this section complete for systems included in this contract.
9. Section 09 21 16 – Gypsum Board Assemblies. Provide this section complete. Also include control joints at interior doors and windows at both sides of the jamb and on both sides of the opening full height of wall in areas with exposed ceilings.
10. Section 09 51 00 – Acoustical Ceilings. Provide this section complete.
11. Section 09 54 26 – Suspended Wood Ceilings. Provide this section complete.
12. Section 09 72 00 – Wall Coverings. Provide this section complete.
13. Section 09 72 13 – Custom Printed wall Coverings. Provide this section complete.
14. Section 09 84 30 – Sound-Absorbing Wall and Ceiling Units. Provide this section complete.
15. Section 09 91 13 – Exterior Painting. Provide this section complete.
16. Section 09 91 23 – Interior Painting. Provide this section complete.
17. Installation of wall or ceiling access panels provided by other trades is included in this contract in drywall walls and ceilings.
18. Z furring and rigid insulation behind Composite Wall Panels is provided and installed by Bid Package A General Trades.
19. Provide an allowance of 120 man hours and $2,500 material allowance for wall patching or painting to be used at the discretion and direction of the Construction Manager. Any unused portion of the allowance shall be credited back to the owner by change order at the completion of the work.

B. Temporary facilities and controls in this Contract include, but are not limited to, the following:
1. Division 01 - Submittal Procedures and Division 01-General Requirements as it relates to work of this contract.
2. Section 01 5000- Temporary Facilities and Controls:
    a. Barriers: Provide temporary construction fencing and gates at staging area if needed by work of this contract.
    b. Security: Maintain secure enclosures at exterior and interior openings until permanent products are placed.
    c. Provide daily clean-up for your work, or Construction Manager may perform the work and deduct the cost from the payments due to contractor. Daily clean-up shall include removal of all small trash associated with Contractor's work. Daily clean-up includes broom cleaning areas required to maintain a clean work area.
    d. Street Cleaning: Provide complete on a daily basis as needed for work of this contract.
3. Provide a broom clean condition in all areas of work.
4. Provide surveying and layout required to complete work of this contract.
5. Provide all temporary construction and construction aids as required for completion of the work. Remove temporary construction upon completion of the work.
6. Provide delivery, unloading and storage at site of all materials as part of this contract.
7. Provide temporary protection of existing finishes during work of this contract. Remove temporary protection upon completion of the work.
8. Provide scaffolding, temporary enclosures, and other temporary facilities required to complete work of this contract. Remove all temporary construction upon completion.
9. Provide barriers, barricades, traffic control and other temporary control measures as required to complete work of this contract that comply with O.S.H.A.
10. Clean-up by Contractor shall be daily, or Construction Manager may perform the work and deduct the cost from the payments due to contractor. Daily clean-up shall include removal of all small trash associated with Contractor's work. Daily clean-up includes broom cleaning areas required to maintain a clean work area.
11. Provide delivery, unloading, and storage of all materials as part of this contract. If materials are stored within the building, all material must be stored on mobile carts to allow for relocation at all times. If material cannot be stored on mobile carts, it must be delivered to the jobsite immediately prior to installation to avoid impacting other trades

12. If scope of work assignments made in Bid Packages conflict with notes on drawings, the bid package language will govern responsibility.

3.11 BID PACKAGE I – KITCHEN EQUIPMENT CONTRACT

A. Work of this Contract includes, but is not limited to, the following:
   1. Section 07 92 00 – Joint Sealants. Provide this section complete for work of this contract.
   2. Section 11 40 00 – Food Service Equipment. Provide this section complete.
   3. Coordinate all mechanical, plumbing, fire protection, and electrical connections with appropriate Bid Packages.

B. Temporary facilities and controls in this Contract include, but are not limited to, the following:
   4. Division 01 - Submittal Procedures and Division 01-General Requirements as it relates to work of this contract.
   5. Section 01 5000- Temporary Facilities and Controls:
      a. Barriers: Provide temporary construction fencing and gates at staging area if needed by work of this contract.
      b. Security: Maintain secure enclosures at exterior and interior openings until permanent products are placed.
      c. Provide daily clean-up for your work, or Construction Manager may perform the work and deduct the cost from the payments due to contractor. Daily clean-up shall include removal of all small trash associated with Contractor's work. Daily clean-up includes broom cleaning areas required to maintain a clean work area.
   6. Provide a broom clean condition in all areas of work.
   7. Provide surveying and layout required to complete work of this contract.
   8. Provide all temporary construction and construction aids as required for completion of the work. Remove temporary construction upon completion of the work.
   9. Provide delivery, unloading and storage at site of all materials as part of this contract.
   10. Provide temporary protection of existing finishes during work of this contract. Remove temporary protection upon completion of the work.
   11. Provide scaffolding, temporary enclosures, and other temporary facilities required to complete work of this contract. Remove all temporary construction upon completion.
   12. Provide barriers, barricades, traffic control and other temporary control measures as required to complete work of this contract that comply with O.S.H.A.
   13. Clean-up by Contractor shall be daily, or Construction Manager may perform the work and deduct the cost from the payments due to contractor. Daily clean-up shall include removal of all small trash associated with Contractor's work. Daily clean-up includes broom cleaning areas required to maintain a clean work area.
   14. Provide delivery, unloading, and storage of all materials as part of this contract. If materials are stored within the building, all material must be stored on mobile carts to allow for relocation at all times. If material cannot be stored on mobile carts, it must be delivered to the jobsite immediately prior to installation to avoid impacting other trades
   15. If scope of work assignments made in Bid Packages conflict with notes on drawings, the bid package language will govern responsibility.

3.12 BID PACKAGE J – FIRE PROTECTION CONTRACT

A. Work of this Contract includes, but is not limited to, the following:
   1. Section 07 84 00 – Firestopping. Provide this section complete where work of this contract passes thru fire rated assemblies.
   2. Section 07 92 00 – Joint Sealants. Provide this section complete where exposed to view or required at smoke/sound rated assemblies.
   3. Division 21 – Fire Suppression. Provide this division complete.
   4. Include any interior housekeeping pad or steel supports as required for equipment provided by this contract.
   5. Include excavation and backfill for your work including compaction of backfill. All backfill inside the building will be granular rock or sand. Haul spoils off site.

6. Provide testing and balancing as required for work of this contract.
7. Furnish any necessary sleeves in concrete for work of this contract to be installed by others.
8. Provide connections to site utilities installed by others.
9. Furnish any access panels required for work of this contract to Bid Package A, D, or H Contractor for installation.
10. Apply and pay for any permit costs required for your specific scope as required by City or State authority having jurisdiction.
11. This project has been designed using Revit. The Revit model will be available for contractor use after bid day. The Precast Concrete, Steel Fabrication, Fire Suppression, Mechanical and Electrical contractors will all be required to input their related trade information into the model. Clash detection shall be the responsibility of the Mechanical contractor on a weekly basis. All above mentioned trades (other than Precast/Steel) shall be available for these weekly meetings in person or via conference call until all clashes have been resolved. Refer to specification section 01 31 13 BIM Coordination Process.

B. Temporary facilities and controls in this Contract include, but are not limited to, the following:
1. Division 01 - Submittal Procedures and Division 01-General Requirements as it relates to work of this contract.
2. Section 01 5000- Temporary Facilities and Controls:
   a. Barriers: Provide temporary construction fencing and gates at staging area and excavation area if needed by work of this contract. General Trades Contract will provide overall site fencing.
   b. Waste Removal: Provide waste removal into dumpsters provided by others.
   c. Provide daily clean-up for your work, or Construction Manager may perform the work and deduct the cost from the payments due to contractor. Daily clean-up shall include removal of all small trash associated with Contractor's work. Daily clean-up includes broom cleaning areas required to maintain a clean work area.
   d. Street Cleaning: Provide complete on a daily basis as needed for work of this contract.
3. Provide a broom clean condition in all areas of work.
4. Provide surveying and layout required to complete work of this contract.
5. Provide all temporary construction and construction aids as required for completion of the work. Remove temporary construction upon completion of the work.
6. Provide delivery, unloading and storage at site of all materials as part of this contract.
7. Provide temporary protection of existing finishes during work of this contract. Remove temporary protection upon completion of the work.
8. Provide scaffolding, temporary enclosures, and other temporary facilities required to complete work of this contract. Remove all temporary construction upon completion.
9. Clean-up by Contractor shall be daily, or Construction Manager may perform the work and deduct the cost from the payments due to contractor. Daily clean-up shall include removal of all small trash associated with Contractor's work. Daily clean-up includes broom cleaning areas required to maintain a clean work area.
10. Provide delivery, unloading, and storage of all materials as part of this contract. If materials are stored within the building, all material must be stored on mobile carts to allow for relocation at all times. If material cannot be stored on mobile carts, it must be delivered to the jobsite immediately prior to installation to avoid impacting other trades.
11. If scope of work assignments made in Bid Packages conflict with notes on drawings, the bid package language will govern responsibility.

3.13 BID PACKAGE K – MECHANICAL & PLUMBING CONTRACT

A. Work of this Contract includes, but is not limited to, the following:
1. Section 07 84 00 – Firestopping. Provide this section complete where your work passes thru fire rated assemblies.
2. Section 07 92 00 – Joint Sealants. Provide this section complete where exposed to view or required at smoke rated assemblies.

3. Division 22 – Plumbing. Provide this division complete.
4. Division 23 – Heating Ventilating and Air Conditioning (HVAC). Provide this division complete.
5. Include controls and control wiring complete.
6. Provide testing and balancing as required for work of this contract complete.
7. Furnish any access panels required for work of this contract to Bid Package A, D or H Contractor for installation.
8. Include cutting, removal and replacement of concrete floors, roof decking, walls for new work, and infill existing walls at removed mechanical components.
9. Apply and pay for any permit costs required for your specific scope as required by City or State authority having jurisdiction.
10. Provide an allowance of $40,000 to be used for temporary heat and dehumidification complete to include labor, material and equipment to be used at the discretion and direction of the CM. The Contractor shall submit a detailed breakdown and document all costs charged to the allowance, which must receive prior approval by the CM. No additional markup will be allowed. Any unused portion of the allowance shall be credited back to the owner by change order at the completion of the work.
11. Provide and install all housekeeping pads as required for work of this bid package.
12. This project has been designed using Revit. The Revit model will be available for contractor use after bid day. The Precast Concrete, Steel Fabrication, Fire Suppression, Mechanical and Electrical contractors will all be required to input their related trade information into the model. Clash detection shall be the responsibility of the Mechanical contractor on a weekly basis. All above mentioned trades (other than Precast/Steel) shall be available for these weekly meetings in person or via conference call until all clashes have been resolved. Refer to specification section 01 31 13 BIM Coordination Process.

B. Temporary facilities and controls in this Contract include, but are not limited to, the following:
   1. Division 01 - Submittal Procedures and Division 01-General Requirements as it relates to work of this contract.
   2. Section 01 5000- Temporary Facilities and Controls:
      a. Barriers: Provide temporary construction fencing and gates at staging area if needed by work of this contract. General Trades Contract will provide overall site fencing.
      b. Waste Removal: Provide waste removal into dumpsters provided by others.
      c. Provide daily clean-up for your work, or Construction Manager may perform the work and deduct the cost from the payments due to contractor. Daily clean-up shall include removal of all small trash associated with Contractor's work. Daily clean-up includes broom cleaning areas required to maintain a clean work area.
      d. Street Cleaning: Provide complete on a daily basis as needed for work of this contract.
   3. Provide a broom clean condition in all areas of work.
   4. Provide surveying and layout required to complete work of this contract.
   5. Provide all temporary construction and construction aids as required for completion of the work. Remove temporary construction upon completion of the work.
   6. Provide delivery, unloading and storage at site of all materials as part of this contract.
   7. Provide temporary protection of existing finishes during work of this contract. Remove temporary protection upon completion of the work.
   8. Provide scaffolding, temporary enclosures, and other temporary facilities required to complete work of this contract. Remove all temporary construction upon completion.
   9. If the permanent heating and ventilation equipment is used as temporary services, provide new equipment filters at project completion, protect intakes form construction dust and debris, and provided extended equipment warranties to date of substantial completion. Any damage to permanent equipment used during construction shall be repaired by this contract.
   10. Clean-up by Contractor shall be daily, or Construction Manager may perform the work and deduct the cost from the payments due to contractor. Daily clean-up shall include

removal of all small trash associated with Contractor's work. Daily clean-up includes broom cleaning areas required to maintain a clean work area.

11. Provide delivery, unloading, and storage of all materials as part of this contract. If materials are stored within the building, all material must be stored on mobile carts to allow for relocation at all times. If material cannot be stored on mobile carts, it must be delivered to the jobsite immediately prior to installation to avoid impacting other trades.
12. If scope of work assignments made in Bid Packages conflict with notes on drawings, the bid package language will govern responsibility.

3.14 BID PACKAGE L – ELECTRICAL CONTRACT

A. Work of this Contract includes, but is not limited to the following:
   1. Section 07 84 13 –Firestopping: Provide this section complete where your work passes thru fire rated assemblies.
   2. Section 07 92 00 – Joint Sealants. Provide this section complete where exposed to view or required at smoke/sound rated assemblies.
   3. Division 26 – Electrical: Provide this division complete.
   4. Division 27 – Communications: Provide this division complete,
   5. Division 28 – Electronic Safety and Security: Provide this division complete.
   6. Salvage all equipment and materials as called for in documents to be reinstalled for this scope. Remove items off-site, provide insurance for stored materials, and bring back and re-install salvaged items where called for in the documents.
   7. Provide electrical services to mechanical equipment as required in contract documents.
   8. Furnish any necessary sleeves in concrete for work of this contract to be installed by others.
   9. Furnish any access panels required for work of this contract to Bid Package A, B or H Contractor for installation.
   10. Electrical demolition includes but is not limited to demolition of panels, devices, light fixtures. If there are items included inside existing walls they will come out with the Selective Demolition by Bid Package A. This bid package will make the walls/ceilings safe before wall/ceiling demolition by others**.**
   11. Install power supply hardware furnished by Bid Package A.
   12. Include removal and replacement of concrete floors/wall for work as required for this scope of work.
   13. Apply and pay for any permit costs required for your specific scope as required by City or State authority having jurisdiction.
   14. Provide and install all housekeeping pads as required for work of this bid package.
   15. This project has been designed using Revit. The Revit model will be available for contractor use after bid day. The Precast Concrete, Steel Fabrication, Fire Suppression, Mechanical and Electrical contractors will all be required to input their related trade information into the model. Clash detection shall be the responsibility of the Mechanical contractor on a weekly basis. All above mentioned trades (other than Precast/Steel) shall be available for these weekly meetings in person or via conference call until all clashes have been resolved. Refer to specification section 01 31 13 BIM Coordination Process.

B. Temporary facilities and controls in this Contract include, but are not limited to, the following:
   1. Division 1 - Submittal Procedures and Division 1-General Requirements as it relates to work of this contract.
   2. Section 01 5000- Temporary Facilities and Controls:
      a. Barriers: Provide temporary construction fencing and gates at staging and excavation areas if needed by work of this contract. General Trades Contract will provide overall site fencing.
      b. Waste Removal: Provide waste removal into dumpsters provided by others.
      c. Provide daily clean-up for your work, or Construction Manager may perform the work and deduct the cost from the payments due to contractor. Daily clean-up shall include removal of all small trash associated with Contractor's work. Daily clean-up includes broom cleaning areas required to maintain a clean work area.
      d. Street Cleaning: Provide complete on a daily basis as needed for work of this contract.

3. Provide surveying and layout required to complete work of this contract.
4. Include all hoisting and material handling for your work.
5. Provide all temporary construction and construction aids as required for completion of the work. Remove temporary construction upon completion of the work.
6. Provide temporary lighting and power requirements for use by all trades that meet OSHA.
7. Provide temporary safety controls as required to maintain safe work environment. Remove temporary controls upon completion of all work.
8. Provide cleaning of all public access and roadways as required by work of this contract. Keep public streets clear of dirt, mud and debris by cleaning streets at the end of each workday, or as required so as not to create a public nuisance. Provide temporary roads and paving to maintain level grades at work locations.
9. Provide 3 phase 208V temporary electrical power services for use of all trades. Temporary power panels shall be no more than a 100'-0" extension cord is required. Provide electrical power to temporary heating, cooling, ventilation, and dehumidification equipment once building or portions thereof, are enclosed with permanent or temporary construction. Remove temporary services at completion of the work or when no longer required. Coordinate with mechanical HVAC contract on quantity and location of temporary equipment.
10. Provide temporary lighting to meet or exceed O.S.H.A. requirements in all areas of the building and maintain throughout until substantial completion. Remove temporary services at completion of the work or until no longer required.
11. Provide temporary electrical service to Construction Manager job site trailer.
12. Clean-up by Contractor shall be daily, or Construction Manager may perform the work and deduct the cost from the payments due to contractor. Daily clean-up shall include removal of all small trash associated with Contractor's work. Daily clean-up includes broom cleaning areas required to maintain a clean work area.
13. Provide delivery, unloading, and storage of all materials as part of this contract. If materials are stored within the building, all material must be stored on mobile carts to allow for relocation at all times. If material cannot be stored on mobile carts, it must be delivered to the jobsite immediately prior to installation to avoid impacting other trades.
14. If scope of work assignments made in Bid Packages conflict with notes on drawings, the bid package language will govern responsibility.

3.15 BID PACKAGE M – EARTHWORK, SITE UTILITIES, AND BUILDING DEMOLITION CONTRACT

A. Work of this Contract includes, but is not limited to the following:
   1. Section 07 92 00 – Joint Sealants. Provide this section complete where exposed to view or required at smoke/sound rated assemblies.
   2. Section 31 05 13 – Soils for Earthwork. Provide this section complete.
   3. Section 31 05 16 – Aggregates for Earthwork. Provide this section complete.
   4. Section 31 05 19.13 – Geotextiles for Earthwork. Provide this section complete.
   5. Section 31 10 00 – Site Clearing. Provide this section complete.
   6. Include structure demolition of existing house and garage complete including disconnecting utilities per City of Moline and Mid- American Energy. Include structure demolition of existing gym, cafeteria and administrative wing of the existing building as shown on drawing C-101. All other paving, sidewalks, playground equipment, trees/stumps and structures complete on C-101.
   7. Section 31 22 13 – Rough Grading. Provide this section complete.
   8. Section 31 23 16 – Excavation. Provide this section complete.
   9. Section 31 23 16.16 - Trenching. Provide this section complete.
   10. Section 31 23 23 – Fill. Provide this section complete.
   11. Section 31 25 00 – Erosion and Sedimentation Controls. Provide this section complete and maintain until project completion per attached schedule. Remove at completion of project.
   12. Division 33 – Utilities. Provide this Division complete.
   13. Include any barricade, traffic control, removal of any sidewalks/paving for installation of Utilities. Include replacement of pavements for this work per City of Moline standards.
   14. Apply and pay for any permit costs required for your specific scope as required by City or State authority having jurisdiction.

B. Temporary facilities and controls in this Contract include, but are not limited to, the following:
   1. Division 1 - Submittal Procedures and Division 1-General Requirements as it relates to work of this contract.
   2. Section 01 5000- Temporary Facilities and Controls:
      a. Barriers: Provide temporary construction fencing and gates at staging and excavation areas if needed by work of this contract. General Trades Contract will provide overall site fencing.
      b. Waste Removal: Provide waste removal into dumpsters provided by others.
      c. Provide daily clean-up for your work, or Construction Manager may perform the work and deduct the cost from the payments due to contractor. Daily clean-up shall include removal of all small trash associated with Contractor's work. Daily clean-up includes broom cleaning areas required to maintain a clean work area.
      d. Street Cleaning: Provide complete on a daily basis as needed for work of this contract.
   3. Provide surveying and layout required to complete work of this contract.
   4. Include all hoisting and material handling for your work.
   5. Provide all temporary construction and construction aids as required for completion of the work. Remove temporary construction upon completion of the work.
   6. Provide temporary lighting and power requirements for use by all trades that meet O.S.H.A.
   7. Provide temporary safety controls as required to maintain safe work environment. Remove temporary controls upon completion of all work.
   8. Provide cleaning of all public access and roadways as required by work of this contract. Keep public streets clear of dirt, mud and debris by cleaning streets at the end of each workday, or as required so as not to create a public nuisance. Provide temporary roads and paving to maintain level grades at work locations.
   9. Clean-up by Contractor shall be daily, or Construction Manager may perform the work and deduct the cost from the payments due to contractor. Daily clean-up shall include removal of all small trash associated with Contractor's work. Daily clean-up includes broom cleaning areas required to maintain a clean work area.
   10. Provide delivery, unloading, and storage of all materials as part of this contract. If materials are stored within the building, all material must be stored on mobile carts to allow for relocation at all times. If material cannot be stored on mobile carts, it must be delivered to the jobsite immediately prior to installation to avoid impacting other trades.
   11. If scope of work assignments made in Bid Packages conflict with notes on drawings, the bid package language will govern responsibility.

END OF SECTION

SECTION 01 20 00
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in Contract Sum and Contract Time.

C. Change procedures.

D. Correlation of Contractor submittals based on changes.

E. Procedures for preparation and submittal of application for final payment.

1.02 RELATED REQUIREMENTS

A. Section 00 52 00 - Agreement Form: Contract Sum, retainages, payment period, monetary values of unit prices.

B. Section 00 72 00 - General Conditions: Additional requirements for progress payments, final payment, changes in the Work.

C. Section 01 78 00 - Closeout Submittals: Project record documents.

1.03 SCHEDULE OF VALUES

A. Use Schedule of Values Form: AIA G703, edition stipulated in the Agreement.

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.

C. Forms filled out by hand will not be accepted.

D. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.

E. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification section. Identify site mobilization.

F. Include in each line item, the amount of Allowances specified in this section.

G. Include separately from each line item, a direct proportional amount of Contractor's overhead and profit.

H. Revise schedule to list approved Change Orders, with each Application For Payment.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.

C. Forms filled out by hand will not be accepted.

D. For each item, provide a column for listing each of the following:
   1. Item Number.
   2. Description of work.
   3. Scheduled Values.
   4. Previous Applications.
   5. Work in Place and Stored Materials under this Application.
   6. Authorized Change Orders.
   7. Total Completed and Stored to Date of Application.
   8. Percentage of Completion.
   9. Balance to Finish.
   10. Retainage.

E. Execute certification by signature of authorized officer.

F. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.

G. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.

H. Submit one electronic and three hard-copies of each Application for Payment.

I. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.05 MODIFICATION PROCEDURES

A. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue instructions directly to Contractor.

B. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
   1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
   2. Promptly execute the change.

C. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within ____ days.

D. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation. Document any requested substitutions in accordance with Section 01 60 00.

E. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
   1. For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
   2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.
   3. For pre-determined unit prices and quantities, the amount will be based on the fixed unit prices.
   4. For change ordered by Architect without a quotation from Contractor, the amount will be determined by Architect based on the Contractor's substantiation of costs as specified for Time and Material work.

F. Substantiation of Costs: Provide full information required for evaluation.
   1. On request, provide the following data:
      a. Quantities of products, labor, and equipment.
      b. Taxes, insurance, and bonds.
      c. Overhead and profit.
      d. Justification for any change in Contract Time.
      e. Credit for deletions from Contract, similarly documented.
   2. Support each claim for additional costs with additional information:
      a. Origin and date of claim.
      b. Dates and times work was performed, and by whom.
      c. Time records and wage rates paid.
      d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
   3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.

G. Adjustments to the Contract Sum, excluding those calculated using unit prices, shall calculate overhead, profit, and general conditions combined at the following percentages of the cost attributed to the change in the Work:
   1. For the Contractor, for Work performed by the Contractor's own forces, add ten percent (10%) of the cost of the Work.
   2. For the Contractor, for Work performed by the Contractor's Subcontractors, add five percent (5%) of the cost of the Work.
   3. For each Subcontractor or Sub-subcontractor involved, for Work performed by the Subcontractor or Sub-subcontractor own forces, add ten percent (10%) of the cost of the Work.
   4. For each Subcontractor, for Work performed by the Subcontractor's Sub-subcontractor, add five percent (5%) of the cost of the Work.
   5. When both additions and credits are involved in any one change, the allowance for overhead and profit shall be figured on the basis of the net increase, if any.

H. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

I. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

J. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

K. Promptly enter changes in Project Record Documents.

1.06 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:
   1. All closeout procedures specified in Section 01 70 00.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 20 00

SECTION 01 23 00
ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 specification sections, apply to this section.

1.2 SUMMARY

A. This section specifies administrative and procedural requirements for alternates.

B. Definition: An alternate is an amount proposed by Bidders and stated on the Bid Form for certain construction activities defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if the Owner decides to accept a corresponding change in either the amount of construction to be completed, or in the product, material, equipment, systems, or installation methods described in the Contract Documents.

C. Coordination: Coordinate related work and modify or adjust adjacent work as necessary to ensure that work affected by each accepted alternate is complete and fully integrated into the project.

D. Notification: Immediately following the award of the Contract, prepare and distribute to each party involved, notification of the status of each Alternate. Indicate whether Alternates have been accepted, rejected or deferred for consideration at a later date. Include a complete description of negotiated modifications to Alternates.

E. Schedule: A "Schedule of Alternates" is included under Part 2 of this Section.

PART 2 - SCHEDULE OF ALTERNATES

A. No. 1: Base bid provide natural turf field. Alternate provide synthetic turf surface for area North of Gymnasium. This includes concrete curb at perimeter.

B. No. 2: Base bid provide wood mulch at Playground area. Alternate provide pourable synthetic surface at Playground. This includes concrete curb at perimeter.

C. No. 3: Base bid provide off street parking only at South end of 11th Street. Alternate 3 provide off street parking at North End of 11th Street and North end of

10th Street. This includes barricades/traffic control, demolition, and placement of concrete sidewalks and paving per City of Moline Standards.

D. No. 4 -Base bid provide no security film at interior wall of cafeteria. Alternate 4 provide security film at glass in cafeteria wall between the Cafeteria 117 and Corridor C001.

E. No. 5 – Base bid no natural boulders. Alternate 5 provide twenty-four natural boulders as shown along the front curve as indicated on the drawings

END OF SECTION

SECTION 01 25 00
SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedural requirements for proposed substitutions.

1.02 RELATED REQUIREMENTS

A. Section 00 21 13 - Instructions to Bidders: Restrictions on timing of substitution requests.

B. Section 00 43 25 - Substitution Request Form - During Procurement: Required form for substitution requests made prior to award of contract (During procurement).

C. Section 01 30 00 - Administrative Requirements: Submittal procedures, coordination.

D. Section 01 60 00 - Product Requirements: Fundamental product requirements, product options, delivery, storage, and handling.

1.03 DEFINITIONS

A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
   1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
      a. Unavailability.
      b. Regulatory changes.
   2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.
      a. Substitution requests offering advantages solely to the Contractor will not be considered.

1.04 REFERENCE STANDARDS

A. CSI/CSC Form 1.5C - Substitution Request (During the Bidding/Negotiating Stage); Current Edition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. Provide products as specified unless substitutions are submitted in the manner described herin, accepted, and documented.

B. Products proposed for substitution that do not meet or exceed all aspects of the products specified will not b

C. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
   2. Agrees to provide the same warranty for the substitution as for the specified product.
   3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
   4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
   5. Waives claims for additional costs or time extension that may subsequently become apparent.
   6. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.

D. A Substitution Request for specified installer constitutes a representation that the submitter:

1. Has acted in good faith to obtain services of specified installer, but was unable to come to commercial, or other terms.

E. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.

F. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
   1. CSI Substitution Request form is required. Contractor's Substitution Request documentation must include the following:
      a. Project Information:
         1) Official project name and number, and any additional required identifiers established in Contract Documents.
         2) Owner's, Architect's, and Contractor's names.
      b. Substitution Request Information:
         1) Discrete and consecutive Substitution Request number, and descriptive subject/title.
         2) Indication of whether the substitution is for cause or convenience.
         3) Issue date.
         4) Reference to particular Contract Document(s) specification section number, title, and article/paragraph(s).
         5) Description of Substitution.
         6) Reason why the specified item cannot be provided.
         7) Differences between proposed substitution and specified item.
         8) Description of how proposed substitution affects other parts of work.
      c. Attached Comparative Data: Provide point-by-point, side-by-side comparison addressing essential attributes specified, as appropriate and relevant for the item:
         1) Physical characteristics.
         2) In-service performance.
         3) Expected durability.
         4) Visual effect.
         5) Sustainable design features.
         6) Warranties.
         7) Other salient features and requirements.
         8) Include, as appropriate or requested, the following types of documentation:
            (a) Product Data:
            (b) Samples.
            (c) Certificates, test, reports or similar qualification data.
            (d) Drawings, when required to show impact on adjacent construction elements.
      d. Impact of Substitution:
         1) Savings to Owner for accepting substitution.
         2) Change to Contract Time due to accepting substitution.

G. Limit each request to a single proposed substitution item.

3.02 SUBSTITUTION PROCEDURES DURING PROCUREMENT

A. Prior to Bid Closing: Substitute products will be considered up to four (4) business days prior to bid closing. Requests received after this date will not be considered.
   1. When a request to substitute a prduct is made, Architect may approve the substitution and, if approved, will document the approval by issuing an Addendum to known bidders.

B. At Time of Bid Closing: Substitute products will be considered if submitted as an attachment to the bidding forms.

C. Submittal Time Restrictions:

3.03 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

A. After the Bid Closing: No substitutions will be considered unless one or more of the following conditions exist:
   1. Product is discontinued.
   2. Delays beyond control such as labor strikes, lockouts, severe weather conditions, fires, or acts of God which may preclude the production and/or delivery of products for purposes of the Project.

B. Submit request for Substitution for Cause within 14 days of discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.

C. Substitutions will not be considered under one or more of the following circumstances:
   1. Failure to award subcontract in sufficient time;
   2. Failure to place orders to ensure delivery without delaying work.
   3. Insuufficient quantity of product;
   4. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
   5. Without a separate written request.
   6. When acceptance will require revisions to Contract Documents.
   7. When they offer advantages solely to the Contractor.

3.04 RESOLUTION

A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.

B. Architect will notify Contractor in writing of decision to accept or reject request.

3.05 ACCEPTANCE

A. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

3.06 CLOSEOUT ACTIVITIES

A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.

B. Include completed Substitution Request Forms as part of the Project record. Include both approved and rejected Requests.

END OF SECTION 01 25 00

SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Web-based project software service.

B. Electronic document submittal service.

C. Preconstruction meeting.

D. Site mobilization meeting.

E. Progress meetings.

F. Construction progress schedule.

G. Progress photographs.

H. Coordination drawings.

I. Submittals for review, information, and project closeout.

J. Number of copies of submittals.

K. Requests for Information (RFI) procedures.

L. Submittal procedures.

1.02 RELATED REQUIREMENTS

A. Section 00 72 00 - General Conditions: Duties of the Construction Manager.

B. Section 01 10 00 - Summary

C. Section 01 60 00 - Product Requirements: General product requirements.

D. Section 01 70 00 - Execution and Closeout Requirements: Additional coordination requirements.

E. Section 01 78 00 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

F. Section 01 91 13 - General Commissioning Requirements: Additional procedures for submittals relating to commissioning.

1. Where submittals are indicated for review by both Architect and the Commissioning Authority, submit one extra and route to Architect first, for forwarding to the Commissioning Authority.
2. Where submittals are not indicated to be reviewed by Architect, submit directly to the Commissioning Authority; otherwise, the procedures specified in this section apply to commissioning submittals.

1.03 PROJECT COORDINATIOR

A. Project Coordinator: Construction Manager.

B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for site access, traffic, and parking facilities.

C. During construction, coordinate use of site and facilities through the Project Coordinator.

D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.

E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities. Responsibility for providing temporary utilities and construction facilities is identified in Section 01 10 00 - Summary.

F. Coordinate field engineering and layout work under instructions of the Project Coordinator.

G. Make the following types of submittals to Architect through the Project Coordinator:
   1. Requests for Information.
   2. Requests for substitution.
   3. Shop drawings, product data, and samples.
   4. Manufacturer's instructions and field reports.
   5. Applications for payment and change order requests.
   6. Progress schedules.
   7. Coordination drawings.
   8. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 WEB-BASED PROJECT SOFTWARE SERVICE

A. Web-Based Project Software Service: Provide, administer, and use web-based project software to host and manage project communication and documentation.
   1. Include, at minimum, the following features:
      a. Project directory, including Owner, Contractor, subcontractors, Architect, Architect's consultants, and other entities involved in the project. Include names of contact persons and contact information for each entity.
      b. Access control for each entity and for each workflow process to determine each entity's digital rights to create, modify, view, and print documents.
      c. Workflow planning, allowing customization of workflow for each project entity.
      d. Creation, logging, tracking, and notification for project communications.
      e. Tracking of project communication statuses in real time, including timestamped response log.
      f. Procedures for viewing PDFs or similar file formats, allowing markups by each entity. Provide security features to lock markups against changes once submitted.
      g. Processing and tracking of payment applications.
      h. Processing and tracking of contract modifications.
      i. Creation and distribution of meeting minutes.
      j. Document management for drawings, specifications, and coordination drawings, including revision control.
      k. Management of construction progress photographs.
      l. Mobile device compatibility.
      m. Creation of data analytics reports.
      n. Creation and export of editable logs for software functions. Provide Owner, Architect, and Architect's consultants with rights and ability to download logs when requested.
   2. Provide user licenses for use by Owner, Architect, Architect's consultants, and other entities involved in the project.
   3. Comply with the software service's current published licensing agreements.
   4. Training: Provide one-hour, web-based training session for users of software service. Further training is the responsibility of the user.
      a. Representatives of Owner are scheduled and included in this training.
   5. Project Closeout: Architect determines when to terminate the software service for the project and is responsible for obtaining archive copies of files for Owner.
   6. Web-Based Project Software Services: The selected service is:

3.02 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) 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. Besides submittals for review, information, and closeout, this procedure applies to Requests for Information (RFIs), progress documentation, contract modification

documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.

2. Contractor and Architect are required to use this service.
3. It is Contractor's responsibility to submit documents in allowable format.
4. Subcontractors, suppliers, and Architect's consultants are to be permitted to use the service at no extra 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, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
6. Paper document transmittals will not be reviewed; emailed electronic documents 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 as selected by the contractor.

C. Training: One, one-hour, web-based training session will be arranged for all participants, with representatives of Architect and Contractor participating; further training is the responsibility of the user of the service.

D. Project Closeout: Architect will determine when to terminate the service for the project and is responsible for obtaining archive copies of files for Owner.

3.03 PRECONSTRUCTION MEETING

A. Project Coordinator will schedule a meeting after Notice of Award.

B. Attendance Required:
1. Owner.
2. Architect.
3. Contractors.

C. Agenda:
1. Execution of Owner-Contractor Agreement.
2. Submission of executed bonds and insurance certificates.
3. Distribution of Contract Documents.
4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
5. Designation of personnel representing the parties to Contract and Architect.
6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
7. Scheduling.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 SITE MOBILIZATION MEETING

A. Project Coordinator will schedule meeting at the Project site prior to Contractor occupancy.

B. Attendance Required:
1. Contractor.
2. Owner.
3. Architect.
4. Special consultants.
5. Contractor's superintendent.
6. Major subcontractors.
7. Construction Manager.

C. Agenda:
   1. Use of premises by Owner, Construction Manager, and Contractor.
   2. Owner's requirements.
   3. Construction facilities and controls provided by Owner.
   4. Temporary utilities provided by Owner.
   5. Survey and building layout.
   6. Security and housekeeping procedures.
   7. Schedules.
   8. Application for payment procedures.
   9. Procedures for testing.
   10. Procedures for maintaining record documents.
   11. Requirements for start-up of equipment.
   12. Inspection and acceptance of equipment put into service during construction period.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.05 PROGRESS MEETINGS

A. Project Coordinator will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

B. Attendance Required:
   1. Contractor.
   2. Owner.
   3. Architect.
   4. Special consultants.
   5. Contractor's superintendent.
   6. Major subcontractors.
   7. Construction Manager.

C. 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 RFIs log and status of responses.
   7. Review of off-site fabrication and delivery schedules.
   8. Maintenance of progress schedule.
   9. Corrective measures to regain projected schedules.
   10. Planned progress during succeeding work period.
   11. Coordination of projected progress.
   12. Maintenance of quality and work standards.
   13. Effect of proposed changes on progress schedule and coordination.
   14. Other business relating to work.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.06 CONSTRUCTION PROGRESS SCHEDULE

A. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

B. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
   1. Include written certification that major contractors have reviewed and accepted proposed schedule.

C. Within 10 days after joint review, submit complete schedule.

D. Submit updated schedule with each Application for Payment.

3.07 PROGRESS PHOTOGRAPHS

A. Submit photographs with each application for payment, taken not more than 3 days prior to submission of application for payment.

B. Photography Type: Digital; electronic files.

C. Provide photographs of site and construction throughout progress of work produced by an experienced photographer, acceptable to Architect.

D. In addition to periodic, recurring views, take photographs of each of the following events:
   1. Completion of site clearing.
   2. Excavations in progress.
   3. Foundations in progress and upon completion.
   4. Structural framing in progress and upon completion.
   5. Enclosure of building, upon completion.
   6. Final completion, minimum of ten (10) photos.

E. Views:
   1. Provide non-aerial photographs from four cardinal views at each specified time, until date of Substantial Completion.
   2. Consult with Architect for instructions on views required.
   3. Provide factual presentation.
   4. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.

F. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.
   1. Delivery Medium: Via email.
   2. File Naming: Include project identification, date and time of view, and view identification.
   3. PDF File: Assemble all photos into printable pages in PDF format, with 2 to 3 photos per page, each photo labeled with file name; one PDF file per submittal.
   4. Hard Copy: Printed hardcopy (grayscale) of PDF file and point of view sketch.

3.08 COORDINATION DRAWINGS

A. Provide information required by Project Coordinator for preparation of coordination drawings.

B. Review drawings prior to submission to Architect.

3.09 REQUESTS FOR INFORMATION (RFI)

A. Definition: A request seeking one of the following:
   1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.

B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.

C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
   1. Prepare a separate RFI for each specific item.
   2. Prepare in a format and with content acceptable to Owner.
   3. Prepare using software provided by the Electronic Document Submittal Service.

D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
   1. Unacceptable Uses for RFIs: Do not use RFIs to request the following::

a. Approval of submittals (use procedures specified elsewhere in this section).
b. Approval of substitutions (see Section - 01 60 00 - Product Requirements)
c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
d. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).

2. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
3. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.

E. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
1. Official Project name and number, and any additional required identifiers established in Contract Documents.
2. Owner's, Architect's, and Contractor's names.
3. Discrete and consecutive RFI number, and descriptive subject/title.
4. Issue date, and requested reply date.
5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
6. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.

F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.

G. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
1. Indicate current status of every RFI. Update log promptly and on a regular basis.
2. Note dates of when each request is made, and when a response is received.
3. Highlight items requiring priority or expedited response.
4. Highlight items for which a timely response has not been received to date.

H. Review Time: Architect will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.

I. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.

4. Notify Architect within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.10 SUBMITTAL SCHEDULE

3.11 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.

C. Samples will be reviewed for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

3.12 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Certificates.
   3. Test reports.
   4. Inspection reports.
   5. Manufacturer's instructions.
   6. Manufacturer's field reports.
   7. Other types indicated.

B. Submit for Architect's knowledge as contract administrator or for Owner.

3.13 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.

B. Submit Final Correction Punch List for Substantial Completion.

C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 78 00 - Closeout Submittals:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Bonds.
   5. Other types as indicated.

D. Submit for Owner's benefit during and after project completion.

3.14 NUMBER OF COPIES OF SUBMITTALS

A. Documents for Review:
   1. Small Size Sheets, Not Larger Than 8-1/2 by 11 inches: Submit the number of copies that Contractor requires, plus one copy that will be retained by Architect.

B. Documents for Information: Submit one copy.

C. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
   1. After review, produce duplicates.
   2. Retained samples will not be returned to Contractor unless specifically so stated.

3.15 SUBMITTAL PROCEDURES

A. General Requirements:
   1. Transmit using approved form.
   2. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
   3. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
   4. 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.
   5. Schedule submittals to expedite the Project, and coordinate submission of related items.
      a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
   6. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
   7. Provide space for Contractor and Architect review stamps.
   8. When revised for resubmission, identify all changes made since previous submission.
   9. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
   10. Submittals not requested will not be recognized or processed.

END OF SECTION 01 30 00

SECTION 01 31 13
BIM COORDINATION PROCESS

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Building Information Modeling (BIM) is an integrated processes to facilitate coordination, resolve clashes, and support a proactive construction process.
B. Coordination of Architectural, Pre-Cast, Structural Steel Fabrication, Mechanical, Electrical, Plumbing, and Fire Protection systems.
C. Services of a BIM Coordinator (Mechanical Contractor).

1.02 RELATED REQUIREMENTS

A. Division 00 – Procurement and Contracting Requirements
B. Division 01 – General Requirements
C. Division 21, 22, 23, 26 – MEP Trade Sections

1.03 BIM COORDINATOR

A. The Mechanical Contractor shall serve as the BIM Coordinator and will:
    a. Collect and manage trade models.
    b. Maintain the shared file exchange platform (FTP or approved system).
    c. Run clash detection using Navisworks.
    d. Issue clash reports prior to coordination meetings.
    e. Lead and document weekly BIM coordination meetings.
    f. Drive resolution of clashes with trade contractors and design team.
B. The Construction Manager shall provide oversight, enforce participation, and facilitate involvement of the Architect/Engineer/Owner as required.

1.04 SUBMITTALS

A. Submit name, address, and telephone number of coordinator(s) for review.
B. Updated coordination models at milestones.
C. Final coordinated models and shop drawings.
D. As-built models at project closeout.

1.05 SCHEDULE AND MEETING REQUIREMENTS

A. A BIM Coordination Kickoff Meeting will be scheduled by the Construction Manager once bids are awarded.
B. The coordination schedule will be established at the BIM Coordination Kickoff Meeting. The building will be divided into coordination areas, and a completion date will be assigned to each area.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 BIM MODEL REQUIREMENTS

A. BIM models will be developed by the design team.

3.02 COORDINATION REQUIRED

A. Coordinate the work listed below:
    a. Precast Concrete
    b. Steel Fabrication
    c. Fire Suppression: Division 21.
    d. Plumbing: Division 22.
    e. Heating, Ventilating, and Air Conditioning: Division 23.
    f. Integrated Automation: Division 25.
    g. Electrical: Division 26.
    h. Communications: Division 27.
    i. Electronic Safety and Security: Division 28.
B. Coordinate progress schedules, including dates for submittals and for delivery of products.
C. Transmit minutes of meetings and reports to concerned parties.

3.03 COORDINATION MEETINGS

A. Weekly coordination meetings shall be scheduled and led by the BIM Coordinator (Mechanical Contractor) as determined at the BIM Coordination Kickoff Meeting.
B. All trades whose work is represented by the models must attend with personnel empowered to resolve conflicts.
C. Updated clash reports shall be issued prior to each meeting.

3.04 CLASH DETECTION AND RESOLUTION

A. The BIM Coordinator (Mechanical Contractor) shall run Navisworks clash detection.
B. Conflicts shall be tracked in clash reports and resolved in meetings.
C. Conflict resolution shall follow established hierarchy: structure and architecture take precedence, followed by major MEP mains, then branch systems.

3.05 MODEL MANAGEMENT

A. Mechanical Contractor shall host and manage shared file site.
B. Trades shall upload current models weekly by deadlines established at kickoff.
C. Models shall comply with naming conventions and formats approved at kickoff.

3.06 FINAL COORDINATION SIGN-OFF

A. At completion of each area, BIM Coordinator (Mechanical Contractor) shall issue coordinated model and drawings for sign-off by each trade.
B. Shop drawings shall not be released for fabrication until coordination sign-off is complete.

3.07 RECORD MODELS

A. Each trade shall update their models to reflect as-built conditions.
B. The Mechanical Contractor shall compile the as-built coordination model for turnover.

SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 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.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspections to be provided and paid by the Owner thru a qualified consultant.

C. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with the Contract Document requirements.
3. Provisions of this Section do not limit requirements for Contractor to provide quality-control services required by Designer, Owner, or authorities having jurisdiction.

D. Related Sections include the following:

1. Division 1 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.
2. Division 1 Section "Cutting and Patching" for repair and restoration of construction disturbed by testing and inspecting activities.
3. Divisions 2 through 44 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Designer.

C. Mockups: Full-size, physical example assemblies to illustrate finishes and materials. Mockups are used to verify selections made under Sample submittals, to demonstrate aesthetic effects

and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples.

D. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.4 DELEGATED DESIGN

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Designer.

1.5 SUBMITTALS

A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

C. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Description of test and inspection.
3. Identification of applicable standards.
4. Identification of test and inspection methods.
5. Number of tests and inspections required.
6. Time schedule or time span for tests and inspections.
7. Entity responsible for performing tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

D. Reports: Prepare and submit certified written reports that include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Ambient conditions at time of sample taking and testing and inspecting.

11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and re-inspecting.

E. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

C. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

D. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.

E. Professional Designer Qualifications: A professional Designer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing Design services of the kind indicated. Design services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirement for specialists shall not supersede building codes and similar regulations governing the Work, nor interfere with local trade-union jurisdictional settlements and similar conventions.

G. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.

H. Preconstruction Testing: Testing agency shall perform preconstruction testing for compliance with specified requirements for performance and test methods.

1. Contractor responsibilities include the following:

a. Provide test specimens and assemblies representative of proposed materials and construction. Provide sizes and configurations of assemblies to adequately demonstrate capability of product to comply with performance requirements.

b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
c. Fabricate and install test assemblies using installers who will perform the same tasks for Project.
d. When testing is complete, remove assemblies; do not reuse materials on Project.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Designer with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

I. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by Designer.
2. Notify Designer seven days in advance of dates and times when mockups will be constructed.
3. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Obtain Designer's approval of mockups before starting work, fabrication, or construction.
5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
6. Demolish and remove mockups when directed, unless otherwise indicated.

1.7 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspecting they are engaged to perform.
2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
3. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.

B. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.

1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

a. Contractor shall not employ the same entity engaged by Owner, unless agreed to in writing by Owner.

2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting w ill be performed.
3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Special Tests and Inspections: Owner will engage a testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner.

1. Testing agency will notify Designer and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
2. Testing agency will submit a certified written report of each test, inspection, and similar quality-control service to Designer with copy to Contractor and to authorities having jurisdiction.
3. Testing agency will submit a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
4. Testing agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
5. Testing agency will retest and re-inspect corrected work.

D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.

E. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.

F. Testing Agency Responsibilities: Cooperate with Designer and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Designer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
4. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
5. Do not perform any duties of Contractor.

G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field-curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 30 days of date established for commencement of the Work.

1. Distribution: Distribute schedule to Owner, Designer, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.
2. Comply with the Contract Document requirements for Division 1 Section "Cutting and Patching."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 01 41 00
REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY OF REFERENCE STANDARDS

A. Regulatory requirements applicable to this project are the following:

B. 28 CFR 35 - Nondiscrimination on the Basis of Disability in State and Local Government Services; Final Rule; Department of Justice; current edition.

C. 28 CFR 36 - Nondiscrimination by Public Accommodations and in Commercial Facilities; Final Rule; Department of Justice; current edition.

D. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.

E. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

F. 29 CFR 1910 - Occupational Safety and Health Standards; Current Edition.

G. State of Illinois amendments to some or all of the following.

H. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

I. ICC (IFC) - International Fire Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

J. NFPA 1 - Fire Code; 2024, with Errata.

K. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

L. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

M. ICC (IPC) - International Plumbing Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

N. IAPMO (UPC) - Uniform Plumbing Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

O. ICC (IMC) - International Mechanical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

P. IAPMO (UPC) - Uniform Plumbing Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

Q. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

R. ICC (IECC) - International Energy Conservation Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.02 RELATED REQUIREMENTS

A. Section 01 40 00 - Quality Requirements.

1.03 QUALITY ASSURANCE

A. Contractor's Designer Qualifications: Refer to Section - 01 40 00 - Quality Requirements.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 41 00

SECTION 01 45 33
CODE-REQUIRED SPECIAL INSPECTIONS AND PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Code-required special inspections.

B. Testing services incidental to special inspections.

C. Submittals.

D. Manufacturers' field services.

E. Fabricators' field services.

1.02 RELATED REQUIREMENTS

A. Document 00 31 00 - Available Project Information: Soil investigation data.

B. Document 00 72 00 - General Conditions: Inspections and approvals required by public authorities.

C. Section 01 30 00 - Administrative Requirements: Submittal procedures.

D. Section 01 40 00 - Quality Requirements.

E. Section 01 60 00 - Product Requirements: Requirements for material and product quality.

1.03 ABBREVIATIONS AND ACRONYMS

A. AHJ: Authority having jurisdiction.

B. NIST: National Institute of Standards and Technology.

1.04 DEFINITIONS

A. Code or Building Code: ICC (IBC), International Building Code, Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements and specifically, Chapter 17 - Special Inspections and Tests.

B. Authority Having Jurisdiction (AHJ): 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.

C. Special Inspection:
   1. Special inspections are inspections and testing of materials, installation, fabrication, erection or placement of components and connections mandated by the AHJ that also require special expertise to ensure compliance with the approved Contract Documents and the referenced standards.
   2. Special inspections are separate from and independent of tests and inspections conducted by Owner or Contractor for the purposes of quality assurance and contract administration.

1.05 REFERENCE STANDARDS

A. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary; 2019 (Reapproved 2022).

B. AISC 360 - Specification for Structural Steel Buildings; 2022, with Errata (2023).

C. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2024.

D. ASTM A706/A706M - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement; 2024.

E. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field; 2024.

F. ASTM C172/C172M - Standard Practice for Sampling Freshly Mixed Concrete; 2017.

G. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2023.

H. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2023.

I. AWS D1.4/D1.4M - Structural Welding Code - Steel Reinforcing Bars; 2018, with Amendment (2020).

J. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

K. ICC (IBC)-2015 - International Building Code; 2015.

L. ICC (IBC)-2018 - International Building Code; 2018.

1.06 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Special Inspection Agency Qualifications: Prior to the start of work, the Special Inspection Agency is required to:
   1. Submit agency name, address, and telephone number, names of full time registered Engineer and responsible officer.
   2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
   3. Submit certification that Special Inspection Agency is acceptable to AHJ.

C. Testing Agency Qualifications: Prior to the start of work, the Testing Agency is required to:
   1. Submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
   2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
   3. Submit certification that Testing Agency is acceptable to AHJ.

D. Manufacturer's Qualification Statement: Manufacturer is required to submit documentation of manufacturing capability and quality control procedures. Include documentation of AHJ approval.

E. Fabricator's Qualification Statement: Fabricator is required to submit documentation of fabrication facilities and methods as well as quality control procedures. Include documentation of AHJ approval.

F. Special Inspection Reports: After each special inspection, Special Inspector is required to promptly submit at least two copies of report; one to Architect and one to the AHJ.
   1. Include:
      a. Date issued.
      b. Project title and number.
      c. Name of Special Inspector.
      d. Date and time of special inspection.
      e. Identification of product and specifications section.
      f. Location in the Project.
      g. Type of special inspection.
      h. Date of special inspection.
      i. Results of special inspection.
      j. Compliance with Contract Documents.

G. Fabricator Special Inspection Reports: After each special inspection of fabricated items at the Fabricator's facility, Special Inspector is required to promptly submit at least two copies of report; one to Architect and one to AHJ.
   1. Include:

a. Date issued.
b. Project title and number.
c. Name of Special Inspector.
d. Date and time of special inspection.
e. Identification of fabricated item and specification section.
f. Location in the Project.
g. Results of special inspection.
h. Verification of fabrication and quality control procedures.
i. Compliance with Contract Documents.
j. Compliance with referenced standard(s).

H. Test Reports: After each test or inspection, promptly submit at least two copies of report; one to Architect and one to AHJ.
1. Include:
a. Date issued.
b. Project title and number.
c. Name of inspector.
d. Date and time of sampling or inspection.
e. Identification of product and specifications section.
f. Location in the Project.
g. Type of test or inspection.
h. Date of test or inspection.
i. Results of test or inspection.
j. Compliance with Contract Documents.

I. Certificates: When specified in individual special inspection requirements, Special Inspector shall submit certification by the manufacturer, fabricator, and installation subcontractor to Architect and AHJ, in quantities specified for Product Data.
1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect and AHJ.

J. Manufacturer's Field Reports: Submit reports to Architect and AHJ.
1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in Contract Documents.

K. Fabricator's Field Reports: Submit reports to Architect and AHJ.
1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in Contract Documents.

1.07 SPECIAL INSPECTION AGENCY

A. Owner or Architect will employ services of a Special Inspection Agency to perform inspections and associated testing and sampling in accordance with ASTM E329 and required by the building code.

B. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.08 TESTING AND INSPECTION AGENCIES

A. Owner or Architect may employ services of an independent testing agency to perform additional testing and sampling associated with special inspections but not required by the building code.

B. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.09 QUALITY ASSURANCE

A. Special Inspection Agency Qualifications:

1. Independent firm specializing in performing testing and inspections of the type specified in this section.

B. Testing Agency Qualifications:
   1. Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 SCHEDULE OF SPECIAL INSPECTIONS, GENERAL

A. Frequency of Special Inspections: Special Inspections are indicated as continuous or periodic.
   1. Continuous Special Inspection: Special Inspection Agency is required to be present in the area where the work is being performed and observe the work at all times the work is in progress.
   2. Periodic Special Inspection: Special Inspection Agency is required to be present in the area where work is being performed and observe the work part-time or intermittently and at the completion of the work.

3.02 SPECIAL INSPECTIONS FOR STEEL CONSTRUCTION

A. Structural Steel: Comply with quality assurance inspection requirements of ICC (IBC)-2018.

B. Open-Web Joists and Joist Girders: Comply with requirements of ICC (IBC), Table 1705.2.3.
   1. End Connections - Welding or Bolted: Comply with requirements of SJI 100; periodic.
   2. Bridging - Horizontal or Diagonal:
      a. Standard Bridging: Comply with requirements of SJI 100; periodic.

C. Structural Steel and Cold Formed Steel Deck Material:
   1. Structural Steel: Verify identification markings comply with AISC 360, Section M3.5; periodic.
   2. Other Steel: Verify identification markings comply with ASTM standards specified in the approved Contract Documents; periodic.
   3. Submit manufacturer's certificates of compliance and test reports; periodic.

D. Welding:
   1. Structural Steel and Cold Formed Steel Deck:
      a. Complete and Partial Joint Penetration Groove Welds: Verify compliance with AWS D1.1/D1.1M; continuous.
      b. Multipass Fillet Welds: Verify compliance with AWS D1.1/D1.1M; continuous.
      c. Single Pass Fillet Welds Less than 5/16 inch Wide: Verify compliance with AWS D1.1/D1.1M; periodic.
      d. Plug and Slot Welds: Verify compliance with AWS D1.1/D1.1M; continuous.
      e. Single Pass Fillet Welds 5/16 inch or Greater: Verify compliance with AWS D1.1/D1.1M; continuous.
      f. Floor and Roof Deck Welds: Verify compliance with AWS D1.3/D1.3M; continuous.
   2. Reinforcing Steel: Verify items listed below comply with AWS D1.4/D1.4M and ACI CODE-318, Section 3.5.2.
      a. Verification of weldability; periodic.
      b. Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames as well as where it is referenced in older codes. Elements of special structural walls of concrete and shear reinforcement; continuous.
      c. Shear reinforcement; continuous.
      d. Other reinforcing steel; periodic.

3.03 SPECIAL INSPECTIONS FOR SOILS

A. Materials and Placement: Verify each item below complies with approved construction documents and approved geotechnical report.
   1. Design bearing capacity of material below shallow foundations; periodic.

2. Design depth of excavations and suitability of material at bottom of excavations; periodic.
3. Materials, densities, lift thicknesses; placement and compaction of backfill: continuous.
4. Subgrade, prior to placement of compacted fill verify proper preparation; periodic.

B. Testing: Classify and test excavated material; periodic.

3.04 SPECIAL INSPECTIONS FOR HELICAL PILE FOUNDATIONS

A. Materials, Equipment and Placement: Verify each item below complies with approved construction documents and approved geotechnical report.
1. Type and capacity of installation equipment used; continuous.
2. Pile dimensions; continuous.
3. Tip elevation; continuous.
4. Final depth; continuous.
5. Final installation torque; continuous.
6. Other installation data requested in writing by Architect; continuous.

3.05 SPECIAL INSPECTIONS FOR WIND RESISTANCE

A. Wind Resisting Components:
1. Roof covering, roof deck, and floor framing connections; periodic.
2. Exterior wall covering and wall connections to roof and floor diaphragms and framing; periodic.

B. Structural Observations for Wind Resistance: Visually observe structural system for general compliance with the approved Contract Documents; periodic.

3.06 OTHER SPECIAL INSPECTIONS

A. Provide for special inspection of work that, in the opinion of the AHJ, is unusual in nature.

B. For the purposes of this section, work unusual in nature includes, but is not limited to:
1. Unusual design applications of materials described in the building code.
2. Materials and systems required to be installed in accordance with the manufacturer's instructions when said instructions prescribe requirements not included in the building code or in standards referenced by the building code.

3.07 SPECIAL INSPECTION AGENCY DUTIES AND RESPONSIBILITIES

A. Special Inspection Agency shall:
1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
2. Perform specified sampling and testing of products in accordance with specified reference standards.
3. Ascertain compliance of materials and products with requirements of Contract Documents.
4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of work or products.
5. Perform additional tests and inspections required by Architect.
6. Submit reports of all tests or inspections specified.

B. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

C. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.08 TESTING AGENCY DUTIES AND RESPONSIBILITIES

A. Testing Agency Duties:
1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
2. Perform specified sampling and testing of products in accordance with specified standards.
3. Ascertain compliance of materials and mixes with requirements of Contract Documents.

4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of work or products.
5. Perform additional tests and inspections required by Architect.
6. Submit reports of all tests or inspections specified.

B. Limits on Testing or Inspection Agency Authority:
1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency may not approve or accept any portion of the work.
3. Agency may not assume any duties of Contractor.
4. Agency has no authority to stop the work.

C. On instructions by Architect, perform re-testing required because of non-compliance with specified requirements, using the same agency.

D. Contractor will pay for re-testing required because of non-compliance with specified requirements.

3.09 CONTRACTOR DUTIES AND RESPONSIBILITIES

A. Contractor Responsibilities, General:
1. Deliver to agency at designated location, adequate samples of materials for special inspections that require material verification.
2. Cooperate with agency and laboratory personnel; provide access to approved documents at project site, to the work, to manufacturers' facilities, and to fabricators' facilities.
3. Provide incidental labor and facilities:
a. To provide access to work to be tested or inspected.
b. To obtain and handle samples at the site or at source of Products to be tested or inspected.
c. To facilitate tests or inspections.
d. To provide storage and curing of test samples.
4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing or inspection services.
5. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

B. Contractor Responsibilities, Wind Force-Resisting System and Wind Force-Resisting Component: Submit written statement of responsibility for each item listed in the Statement of Special Inspections to AHJ and Owner prior to starting work. Statement of responsibility shall acknowledge awareness of special construction requirements and other requirements listed.

3.10 MANUFACTURERS' AND FABRICATORS' FIELD SERVICES

A. When specified in individual specification sections, require material suppliers, assembly fabricators, or product manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

END OF SECTION 01 45 33

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Dewatering
B. Temporary utilities: Electricity, lighting, heat, ventilation.
C. Temporary sanitary facilities.
D. Temporary Controls: Barriers and enclosures.
E. Security requirements.
F. Vehicular access and parking.
G. Waste removal facilities and services.
H. Project identification sign.
I. Field offices.

1.02 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
B. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

1.03 GENERAL

A. Install temporary facilities and utilities in conformance with state and local codes and requirements.
B. Prime Contractors to obtain and pay for required applications, permits and inspections.
C. Early Service: Any Prime Contractor requiring temporary service before it can be provided as specified, or whose requirements with respect to a particular service differ from the service specified shall provide such service as suits his needs, at his own expense, and in a manner satisfactory to the Construction Manager.
D. Maintenance: Temporary facilities and utilities are to be maintained and kept in good operating condition. Maintenance men necessary to perform this work shall be provided in accordance with requirements. Maintenance time will include normal working hours for all trades and start up and shut down overtime as required.
E. Removals: Subject to approval of Construction Manager, Prime Contractor providing temporary facilities or services shall remove same when no longer required or when their function is replaced by authorized use of permanent facilities. Other removal time may be directed by Construction Manager.
F. Install temporary work in such a manner as not to interfere with the permanent construction.
G. Disclaimer: Specific administrative and procedural minimum actions are specified in this section, as extension of provisions in General Conditions and other contract documents. These requirements have been included for special purposes as indicated. Nothing in this section is intended to limit types and amounts of temporary work required, and no omission from this section will be recognized as an indication by Architect, Engineer or Construction Manager that such temporary activity is not required for successful completion of the work and compliance with requirements of contract documents. Provisions of this section are applicable to, but not by way of limitation, utility services, construction facilities, security/protection provisions, and support facilities.
H. Use of permanent systems and facilities:
    1. Obtain written agreement with Owner, establishing start of warranties and conditions of use:
        a. Systems complete, with utility connections and safety devices.

b. Automatic controls operational.
c. Temporary filters and items required for protection of equipment and finishes are in place.
d. Replace items damaged during temporary service use.

1.04 DEWATERING

A. Provide temporary means and methods for dewatering all temporary facilities and controls.
B. Maintain temporary facilities in operable condition.

1.05 TEMPORARY UTILITIES

A. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes. Utility consumption costs to be paid by owner.
1. General Responsibilities: Temporary heating responsibilities and equipment types relate to the extent of building enclosure and work performed as follows:
a. Prior to Enclosure of any Type: Temporary heat for the building prior to the building being partially enclosed in each Trade contractor's responsibility. Each Contractor shall provide, at his own expense, all cold weather protection and temporary heat as required to carry out his work expeditiously during inclement weather and to protect all his work and materials from damage by the weather.
1) Equipment: No restrictions are placed on heating equipment except that such equipment shall conform to applicable safety regulations and its use shall not damage or otherwise be detrimental to the appearance of the Work.
a) Cost: All Costs borne by Prime Contractor providing temporary heat.
b) Work Restrictions: No work with interior type finishes or work permitted which may be damaged by direct contact with water.
b. Partial Enclosure: Temporary heat for partially enclosed portions of the building prior to the building being permanently enclosed is Mechanical Contractor's responsibility. Partial enclosure is defined as permanent walls of the space in place, all openings provided with suitable temporary enclosures or permanent enclosures, not less than one floor slab or roof directly above the space in place.
1) Equipment: Heating equipment shall be approved indirect gas fired heaters. Operation of electric resistance heaters or air-conditioning units is optional but all associated fuel costs for increased temporary electric power, if available, and separate metering to be borne by the using Prime Contractor.
2) Cost: All costs borne by Mechanical Contractor providing temporary heat. Cost of fuel and electric power consumed paid for by the Owner.
3) Work Restrictions: No interior type finish work beyond hanging wallboard. Protect all such work from becoming wet.
c. Permanent Enclosure: Temporary heat of the building after the building is permanently enclosed and approved as such by the Architect, shall be provided by the Mechanical Contractor. Permanent enclosure is defined as permanent walls, roofs, copings, and flashings in place and weathertight, windows in place and glazed and all entrance enclosures either permanently in place or provided with suitable temporary enclosures.
1) Equipment: Temporary construction heaters, indirect fire heaters.
2) Cost: All costs borne by Mechanical Contractor providing temporary heat. Cost of fuel and electric power consumed paid for by the Owner.
3) Work Restrictions: None except as may be stated in separate Specification Sections or required by the manufacturer, such as special ventilation requirements.
2. Ventilation: The Mechanical Contractor shall provide ventilation for the building and to prevent building up of harmful dusts and fumes and to remove excess moisture. During warm weather, provide an adequate supply of fresh air (minimum 1 to 1-1/2 air changes per hour)

when necessary to properly ventilate for moisture, dust, fumes from paints, cements, or adhesives in tightly enclosed area where natural ventilation will not be sufficient. Ventilation requirements may be supplemented by the building's permanent HVAC system but primary responsibility rests with the designated trade contractor.

3. Mechanical Prime Contractor Responsibilities:
    a. Maintain as to temperatures and ventilation required for work in various parts of the building as follows:
        1) Stored Materials: As recommended by manufacturer.
        2) Installed Materials: As recommended by manufacturer for the length of time following installation.
    b. Maintain that portion of any floor thereof which has been constructed, or partly constructed, at a temperature and humidity that will ensure against damage due to warping, buckling, excessive shrinkage, etc., and adequate ventilation until the permanent HVAC system is operating. Contractor will be responsible for damage to work under other contracts due to smoke or other damage caused by improper temporary heating.
    c. Installation, connection, operation, and maintenance of temporary heating and ventilating devices to be performed by tradesmen proficient in the skills required and meet requirements of applicable regulatory agencies.
    d. Temperature Requirements:
        1) Provide temperatures required in various parts of the buildings as specified herein below:
        2) All Trades: provide the range of temperatures required for temporary heat, so the temperature as recommended by the manufacturer of the material concerned is maintained while such materials as mentioned above are stored in the building or being installed, and for the length of time recommended following installation. In those portions of the building where work is in progress or completed, it must be protected from freezing if subject to damage there from.
4. During General Contract Work: Provide the following:
    a. During installation of gypsum wallboard or gypsum lath, a temperature of not less than 55 deg F during working hours, and a temperature of at least 40 deg F at all other times throughout the heating season.
    b. Wall before plaster work or joint work for gypsum wall board begins and continuous throughout setting and drying periods, a temperature range between 50 and 75 deg F shall be maintained day and night. During this period, no finish woodwork, resilient flooring or flexible wall coverings shall be installed or stored in the buildings, and no finish painting or applying of finish wall coatings shall be undertaken.
    c. For a period of 10 days previous to the placing of interior wood finish and throughout the placing of this and other interior finishing, varnishing, painting, etc., and until final acceptance of the work or until fully occupied by the Owner, provide sufficient heat to produce a temperature of not less than 60 deg F.
5. Permanent Systems:
    a. Ten days prior to setting millwork and/or wood doors and when approved by Architect, use and maintain the permanent HVAC system for heating, cooling and ventilation. The amount of time the permanent system will be used during the construction project should be at most four months. Maintenance shall include the following:
        1) Proper operation and maintenance of the HVAC plant until acceptance of building by Owner.

2) Maintenance of temporary filters in all equipment to prevent accumulation of dust and dirt in coils, housing, and ductwork.
3) Prior to Final Inspection: Replacement of all (temporary and existing) filters with new filters, thorough cleaning of coils and other equipment, putting entire system into first class condition, cleaning traps and devices, adjustment and renewal of all materials and equipment not functioning correctly.
4) Use of permanent heating or cooling equipment for temporary heating or cooling shall not affect guarantee. Guarantee shall take effect at time of building acceptance by Owner. Mechanical prime contractor to provide extended warranty as needed.
5) Cost of all fuel for operation of permanent heating system shall be paid by the Prime Contractor and be reimbursed in full by the Owner.

b. Close off return air to the permanent systems and provide only single-pass air during the course of construction. This practice shall remain in place until area is clean and system is ready for final balancing.
c. Replace filters in all equipment to prevent accumulation of dust and dirt in coils, housings, and ductwork.

6. Prior to Final Inspection:
a. Replace temporary filters with new filters.
b. Thoroughly clean coils and other equipment.
c. Clean traps and devices, adjust and renew any and all materials and equipment not functioning correctly.
d. Vacuum clean the duct system.
e. Restore equipment to like new condition.

B. Temporary light and power:
1. Each Trade Contractor:
a. Provide temporary light and power for its own construction field office.
b. Provide and pay for its own extensions for lights or power tools beyond the receptacle outlets provided below.
2. Electrical Contractor:
a. Provide temporary light and power distribution for construction purposes for all trades including the cost of running temporary service from the utility supply. The temporary lighting and power system shall comply with all applicable OSHA regulations.
1) Temporary power to be sufficient to operate all "light tools" and equipment (electric arc welders excluded) and permanent building equipment including elevators and HVAC system.
2) Additional temporary power required by other trades to be furnished, at their cost, up to the power available.
3) Temporary power shall be available throughout the interior of the building and accessible by a maximum distance of 100’
3. The electrical requirements for all temporary heating and ventilating systems shall be connected directly to the project temporary power system until the primary service is installed.
4. Temporary lighting distribution to be made from the temporary panels indicated above. Each circuit shall consist of "pigtail" receptacles on 20 foot centers with 200 watt lamps installed in every other receptacle leaving the alternate receptacles for added concentration of lighting as needed. Wire fixtures with #8 AWG wire and suspend at least 10'-6" above the floor.
a. As interior partitions are erected, revise the temporary lighting arrangements so that not less than 1 lamp is provided in each space if needed for work or required for safety.

Also, install lights as directed by Construction Manager, in smaller areas where required to provide adequate light for work being carried out in the space.

b. Receptacle Outlets: See temporary light and power.
c. Furnish and install 200 Watt lamps for general circuit lighting and all fuses as may be required for a complete job.
d. Replace lamps, fuses, including theft, throughout the life of the project.
e. Install and maintain a reasonably balanced system and take current readings on the feeders at regular intervals as required. Correct any serious phase unbalance.
f. Protect the installation against weather damage, normal operations of other trades, and other persons on the site. Be responsible for the proper use and maintenance of temporary wiring systems until they are removed.

1.06 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
B. New permanent facilities may not be used during construction operations.
C. Maintain twice per week in clean and sanitary condition.
D. At end of construction, return facilities to same or better condition as originally found.

1.07 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations.
B. Provide protection for plants designated to remain. Replace damaged plants.
C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.08 WATER CONTROL

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
C. Provide temporary drainage trenches, drains, sumps, pumps, or other items required to afford satisfactory working conditions for the execution, completion and protection of the work. Water shall be diverted to or shall be pumped into existing sewerage systems or ditches and shall not be allowed to run onto ground surface area.

1.09 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.

1.10 WEATHER PROTECTION

A. Protect work and existing or adjacent property against weather, to maintain their work, materials, apparatus and fixtures free form injury or damage in accordance with the General conditions during the entire construction period. Work damaged by failure to provide weather protection all be removed and replaced with new work at the contractor's expense.
B. Provide temporary non-staining waterproof coverings to close-off cavities and shed water to exterior and lap wall assemblies not less than 4 inches. Maintain in watertight condition until permanent coverings are in place.
C. Remove all snow and ice as may be required for proper protection and execution of the work and protect and safety of the public.

1.11 SECURITY

A. Provide security and facilities to protect Work, and Owner's operations from unauthorized entry, vandalism, or theft.
B. Coordinate with Construction Managers Security provisions.

1.12 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 traffic control at critical areas of haul routes to regulate traffic, to minimize interference with public traffic.
D. Provide and maintain access to fire hydrants, free of obstructions. Leave fire lanes and aisles to fire fighting equipment unobstructed at all times. Do not pile material in front of fire equipment, fire doors, or hydrants.
E. Provide means of removing mud from vehicle wheels before entering streets.
F. Designated existing on-site roads may be used for construction traffic.
G. Construct and maintain temporary roads accessing public thoroughfares to serve construction area. Extend and relocate as Work progress requires. Provide detours necessary for unimpeded traffic flow.
H. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.
I. Existing parking areas may be used for construction parking.
J. Do not obstruct egress to and from parking areas unless authorized by Owner.
K. Provide one parking space for Owner use.
L. Provide one additional parking space for Visitor use.
M. Parking of private vehicles of workers shall be in an area allocated by Project Coordinator and/or Owner.

1.13 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition. Locate in area designated by Owner and Project Coordinator.
B. Provide containers with lids. Remove trash from site weekly, legally disposing of waste materials, debris and rubbish off site and off Owner's property.
C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.
E. Remove waste materials, debris, and rubbish from building daily.
F. Carts, trucks, etc. used to transport materials shall be loaded in a safe manner. Materials shall not protrude beyond the sides of conveyance used.
G. Materials shall not be thrown or dropped from scaffolds or other overhead areas.
H. Gasoline or other highly flammable liquids shall not be brought inside facilities.

1.14 PROJECT IDENTIFICATION

A. Provide project identification sign of design and construction indicated on drawings.
B. Erect on site at location established by Architect.
C. No other signs are allowed without Owner permission except those required by law.

1.15 FIELD OFFICES

A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture and drawing display table.
   1. Review proposed location within Project Site with Owner.
   2. Provide space for Project meetings, with table and chairs to accommodate 12 persons.
B. Locate offices a minimum distance of 30 feet from existing and new structures.
C. Field Offices shall be maintained until final acceptance and then be removed by the responsible party, no later than fifteen (15) days after acceptance of building, unless the Project Coordinator orders or approves earlier removal.
D. Expenses:
   1. Project Coordinator: All expenses in connection with their Field Offices, including the installation costs and use of telephones, heat, air-conditioning, light, water and janitor service shall be paid for by the Project Coordinator and will be fully reimbursed by the Owner.
   2. Trade Contractors: All expenses associated with their offices including utility installation costs shall be included in their bid.
   3. Toll Costs: All long distance calls to be paid for by party placing call including Architect, Owner's representative, and contractors.
E. Each Trade Contractor: To keep a complete set of drawings, and specifications kept marked up to date with revision, Addenda, as-built drawings, and all permits and approved shop drawings on file.

1.16 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.
B. Clean and repair damage caused by installation or use of temporary work.
C. Restore existing facilities used during construction to original condition.
D. Restore new permanent facilities used during construction to specified condition.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

SECTION 01 60 00
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 10 00 - Summary: Lists of products to be removed from existing building.

B. Section 01 25 00 - Substitution Procedures: Substitutions made during procurement and/or construction phases.

C. Section 01 40 00 - Quality Requirements: Product quality monitoring.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS

A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

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 required.
   1. See Section 01 10 00 for list of items required to be salvaged for reuse and relocation.
   2. If reuse of other existing materials or equipment is desired, submit substitution request.

2.02 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by Contract Documents.

B. See Section 01 40 00 - Quality Requirements, for additional source quality control requirements.

C. Use of products having any of the following characteristics is not permitted:
   1. Containing lead, cadmium, or asbestos.

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: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. 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; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

A. See Section 01 25 00 - Substitution Procedures.

3.02 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.

3.03 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.

G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.

H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 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. See Section 01 74 19.

C. Store and protect products in accordance with manufacturers' instructions.

D. Store with seals and labels intact and legible.

E. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.

F. For exterior storage of fabricated products, place on sloped supports above ground.

G. Provide off-site storage and protection when site does not permit on-site storage or protection.

H. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

I. Comply with manufacturer's warranty conditions, if any.

J. Do not store products directly on the ground.

K. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

L. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

M. Prevent contact with material that may cause corrosion, discoloration, or staining.

N. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

O. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION 01 60 00

SECTION 01 77 00
EXECUTION AND CLOSEOUT PROCEDURES

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. Cutting and patching.

D. Laying out the Work.

E. Cleaning and protection.

F. Starting of systems and equipment.

G. Demonstration and instruction of Owner personnel.

H. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

I. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

A. Section 01 78 00 – Closeout Submittals

1.03 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. 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. Extent: Describe reason for and extent of each occurrence of cutting and patching.
      b. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
      c. Products: List products to be used for patching and firms or entities that will perform patching work.
      d. Dates: Indicate when cutting and patching will be performed.
      e. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
         1) Include description of provisions for temporary services and systems during interruption of permanent services and systems.

1.05 QUALIFICATIONS

A. For surveying work, employ a land surveyor registered in the State in which the Project is located. 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,

1.06 QUALITY ASSURANCE

A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
   1. Structural Elements: When cutting and patching structural elements, notify Construction Manager of locations and details of cutting and await directions from Construction Manager before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
   2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
      a. Primary operational systems and equipment.
      b. Fire separation assemblies.
      c. Air or smoke barriers.
      d. Fire-suppression systems.
      e. Mechanical systems piping and ducts.
      f. Control systems.
      g. Communication systems.
      h. Fire-detection and -alarm systems.
      i. Conveying systems.
      j. Electrical wiring systems.
      k. Operating systems of special construction.
   3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:
      a. Water, moisture, or vapor barriers.
      b. Membranes and flashings.
      c. Exterior curtain-wall construction.
      d. Sprayed fire-resistive material.
      e. Equipment supports.
      f. Piping, ductwork, vessels, and equipment.
      g. Noise- and vibration-control elements and systems.
   4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

1.07 PROJECT CONDITIONS

A. Use of explosives is not permitted.

B. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

C. 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 barriers between construction areas and areas continuing to be occupied by Owner.

D. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

E. 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.

1.08 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. 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.

D. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

E. Coordinate completion and clean-up of work of separate sections.

F. 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. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
   1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Construction Manager for the visual and functional performance of in-place materials.

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. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
   1. Description of the Work.
   2. List of detrimental conditions, including substrates.
   3. List of unacceptable installation tolerances.
   4. Recommended corrections.

H. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.02 PREPARATION

A. Existing Utility Information: Furnish information to Construction Manager that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Clean substrate surfaces prior to applying next material or substance.

E. Seal cracks or openings of substrate prior to applying next material or substance.

F. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Construction Manager of any discrepancies discovered.

C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

D. Promptly report to Construction Manager the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Construction Manager.

F. Utilize recognized engineering survey practices.

G. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.

3.04 GENERAL INSTALLATION REQUIREMENTS

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
   1. Make vertical work plumb and make horizontal work level.
   2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
   3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.

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. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

D. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
   1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
   2. Allow for building movement, including thermal expansion and contraction.
   3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

E. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

F. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

G. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

H. Make neat transitions between different surfaces, maintaining texture and appearance.

I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.05 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. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.
   2. Relocate items indicated on drawings.
   3. 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.
   4. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.

C. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): 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 accessible 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.

D. 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.

E. Adapt existing work to fit new work: Make as neat and smooth transition as possible.

F. 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.

G. 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.

H. Clean existing systems and equipment.

I. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

3.06 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. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

F. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

G. Temporary Support: Provide temporary support of work to be cut.

H. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

I. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

J. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
   1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
   2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
   3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
   4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
   5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
   6. Proceed with patching after construction operations requiring cutting are complete.

K. Restore work with new products in accordance with requirements of Contract Documents.

L. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

M. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material , to full thickness of the penetrated element.

N. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
   1. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
      a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
   2. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
   3. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
   4. 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.
   5. Match color, texture, and appearance.
   6. 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.

3.07 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.

3.08 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
   1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
   2. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
      a. Use containers intended for holding waste materials of type to be stored.

B. Site: Maintain Project site free of waste materials and debris.
   1. Mow grass and weed growth areas to keep growth maintained.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
   1. Remove liquid spills promptly.
   2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.09 SYSTEM STARTUP

A. Coordinate schedule for start-up of various equipment and systems.

B. 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.

C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

D. Verify that wiring and support components for equipment are complete and tested.

E. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.

F. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.10 DEMONSTRATION AND INSTRUCTION

A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.

3.11 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.12 FINAL CLEANING

A. General: Final cleaning shall be conducted by Construction Manager. Frequent progress cleaning and post-construction general cleaning shall be conducted by all Contractors.

3.13 CLOSEOUT PROCEDURES

A. Accompany Construction Manager and Architect on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

B. Substantial Completion Procedures
   1. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
   2. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
      a. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
      b. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
      c. Submit closeout submittals specified in individual Divisions 02 through 33 Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
      d. Submit maintenance material submittals specified in individual Divisions 02 through 33 Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Construction Manager. Label with manufacturer's name and model number where applicable.
         1) Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section.
      e. Submit test/adjust/balance records.
      f. Submit sustainable design submittals required in Division 01 sustainable design requirements Section and in individual Division 02 through 33 Sections.
      g. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

3. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
    a. Advise Construction Manager of pending insurance changeover requirements.
    b. Make final changeover of permanent locks and deliver keys to Construction Manager. Advise Owner's personnel of changeover in security provisions.
    c. Complete startup and testing of systems and equipment.
    d. Perform preventive maintenance on equipment used prior to Substantial Completion.
    e. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Division 01 Section "Demonstration and Training."
    f. Advise Owner of changeover in heat and other utilities.
    g. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
    h. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
    i. Complete final cleaning requirements, including touchup painting.
    j. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
4. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Construction Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect's punch list, that must be completed or corrected before certificate will be issued.
    a. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
    b. Results of completed inspection will form the basis of requirements for final completion.

C. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Construction Manager 's comprehensive list of items identified to be completed or corrected and submit to Construction Manager.

D. Final Completion Procedures:
1. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:
    a. Submit a final Application for Payment according to Division 01 Section "Price and Payment Procedures."
    b. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect and CM. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
    c. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
    d. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
2. Inspection: Submit a written request for final inspection to determine acceptance. On receipt of request, Construction Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Construction Manager will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
    a. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

E. List of Incomplete Items (Punch List)
   1. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
      a. Organize list of spaces in sequential order.
      b. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

3.14 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
   1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
   2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
      a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
   3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
   4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

3.15 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 two years from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.

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 78 00
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

1.02 RELATED REQUIREMENTS

A. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

B. Individual Product Sections: Specific requirements for operation and maintenance data.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to Construction Manager with claim for final Application for Payment.

B. Operation and Maintenance Data:
   1. Submit preliminary draft or proposed formats and outlines of contents before start of Work. Construction Manager will review draft and return with comments.
   2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with comments. Revise content of all document sets as required prior to final submission.
   4. Submit a set of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.

B. Record Prints:
   1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
      a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
      b. Accurately record information in an acceptable drawing technique.
      c. Record data as soon as possible after obtaining it.
      d. Record and check the markup before enclosing concealed installations.
      e. Cross-reference record prints to corresponding archive photographic documentation.

2. Content: Types of items requiring marking include, but are not limited to, the following:
    a. Dimensional changes to Drawings.
    b. Revisions to details shown on Drawings.
    c. Depths of foundations below first floor.
    d. Locations and depths of underground utilities.
    e. Revisions to routing of piping and conduits.
    f. Revisions to electrical circuitry.
    g. Actual equipment locations.
    h. Duct size and routing.
    i. Locations of concealed internal utilities.
    j. Changes made by Change Order or Construction Change Directive.
    k. Changes made following written orders.
    l. Details not on the original Contract Drawings.
    m. Field records for variable and concealed conditions.
    n. Record information on the Work that is shown only schematically.
3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

C. Ensure entries are complete and accurate, enabling future reference by Owner.

D. Store record documents separate from documents used for construction.

E. Record information concurrent with construction progress.

F. Specifications: Legibly mark and 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.

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.

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. 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. For Each Item of Equipment and Each System:
   1. Description of unit or system, and component parts.
   2. Identify function, normal operating characteristics, and limiting conditions.
   3. Include performance curves, with engineering data and tests.
   4. Complete nomenclature and model number of replaceable parts.

B. 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.

C. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

D. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

E. Provide servicing and lubrication schedule, and list of lubricants required.

F. Include manufacturer's printed operation and maintenance instructions.

G. Include sequence of operation by controls manufacturer.

H. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

I. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Operation and Maintenance Manual Electronic File: Assemble complete operation and maintenance manual submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

C. Where systems involve more than one specification section, provide separate linked dividers for each system.

D. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Construction Manager, Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

F. Tables of Contents: List every item using the same identification as on the divider tabs; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

H. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
   1. Part 1: Directory, listing names, addresses, and telephone numbers of Construction Manager, Architect, Contractor, Subcontractors, and major equipment suppliers.

2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
   a. Significant design criteria.
   b. List of equipment.
   c. Parts list for each component.
   d. Operating instructions.
   e. Maintenance instructions for equipment and systems.
   f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
3. Part 3: Project documents and certificates, including the following:
   a. Shop drawings and product data.
   b. Photocopies of warranties and bonds.

END OF SECTION

SECTION 01 79 00
DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.01 SUMMARY

A. Demonstration of products and systems where indicated in specific specification sections.

B. Training of Owner personnel in operation and maintenance is required for:
   1. HVAC systems and equipment.
   2. Plumbing equipment.
   3. Electrical systems and equipment.
   4. Conveying systems.

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.

1.02 RELATED REQUIREMENTS

A. Section 01 78 00 - Closeout Submittals: Operation and maintenance manuals.

B. Section 01 91 13 - General Commissioning Requirements: Additional requirements applicable to demonstration and training.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Training Plan: Owner will designate personnel to be trained; tailor training to needs and skill-level of attendees.
   1. Submit to Architect for transmittal to Owner.
   2. Submit not less than four weeks prior to start of training.
   3. Revise and resubmit until acceptable.
   4. Provide an overall schedule showing all training sessions.
   5. 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 a 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.

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.

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. Demonstration may be combined with Owner personnel training if applicable.

C. 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.

D. 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. Provide training in minimum two hour segments.

D. 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.

E. 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.

F. 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.

G. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION 01 79 00

SECTION 01 91 13
GENERAL COMMISSIONING REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Commissioning is intended to achieve the following specific objectives; this section specifies the Contractor's responsibilities for commissioning:
   1. Verify that the work is installed in accordance with Contract Documents and the manufacturer's recommendations and instructions, and that it receives adequate operational checkout prior to startup: Startup reports and Prefunctional Checklists executed by Contractor are utilized to achieve this.
   2. Verify and document that functional performance is in accordance with Contract Documents: Functional Tests executed by Contractor and witnessed by the Commissioning Authority are utilized to achieve this.
   3. Verify that operation and maintenance manuals submitted to Owner are complete: Detailed operation and maintenance (O&M) data submittals by Contractor are utilized to achieve this.
   4. Verify that the Owner's operating personnel are adequately trained: Formal training conducted by Contractor is utilized to achieve this.

B. Commissioning, including Functional Tests, O&M documentation review, and training, is to occur after startup and initial checkout and be completed before Substantial Completion.

C. The Commissioning Authority directs and coordinates all commissioning activities; this section describes some but not all of the Commissioning Authority's responsibilities.

D. The Commissioning Authority is employed by Construction Manager on behalf of Owner.

1.02 SCOPE OF COMMISSIONING

A. The following are to be commissioned:
   1. HVAC System, including:
      a. Major and minor equipment items.
      b. Piping systems and equipment.
      c. Ductwork and accessories.
      d. Terminal units.
      e. Control system.
      f. Sound control devices.
      g. Vibration control devices.
      h. Variable frequency drives.
   2. Electrical Systems:
      a. Emergency power systems.
      b. Lighting controls other than manual switches.

B. Other equipment and systems explicitly identified elsewhere in Contract Documents as requiring commissioning.

1.03 RELATED REQUIREMENTS

A. Section 01 78 00 - Closeout Submittals: Scope and procedures for operation and maintenance manuals and project record documents.

B. Section 01 79 00 - Demonstration and Training: Scope and procedures for Owner personnel training.

C. Section 23 08 00 - Commissioning of HVAC: HVAC control system testing; other requirements.

1.04 REFERENCE STANDARDS

A. ASHRAE Std 202 - The Commissioning Process Requirements for New Buildings and New Systems; 2024.

B. ASTM E336 - Standard Test Method for Measurement of Airborne Sound Attenuation Between Rooms in Buildings; 2025.

C. PECI (Samples) - Sample Forms for Prefunctional Checklists and Functional Performance Tests; Current Edition.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures; except:

B. Product Data: If submittals to Architect do not include the following, submit copies as soon as possible:
   1. Manufacturer's product data, cut sheets, and shop drawings.
   2. Manufacturer's installation instructions.
   3. Startup, operating, and troubleshooting procedures.
   4. Fan and pump curves.
   5. Factory test reports.
   6. Warranty information, including details of Owner's responsibilities in regard to keeping warranties in force.

C. Manufacturers' Instructions: Submit copies of all manufacturer-provided instructions that are shipped with the equipment as soon as the equipment is delivered.

D. Startup Plans and Reports.

E. Completed Prefunctional Checklists.

F. Commissioning Issues Log:
   1. Construction observations.
   2. Supporting photographs.

1.06 QUALITY ASSURANCE

A. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 PRODUCTS

2.01 TEST EQUIPMENT

A. Provide all standard testing equipment required to perform startup and initial checkout and required Functional Testing; unless otherwise noted such testing equipment will NOT become the property of Owner.

B. Calibration Tolerances: Provide testing equipment of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified. If not otherwise noted, the following minimum requirements apply:
   1. Temperature Sensors and Digital Thermometers: Certified calibration within past year to accuracy of 0.5 degree F and resolution of plus/minus 0.1 degree F.
   2. Pressure Sensors: Accuracy of plus/minus 2.0 percent of the value range being measured (not full range of meter), calibrated within the last year.
   3. Calibration: According to the manufacturer’s recommended intervals and when dropped or damaged; affix calibration tags or keep certificates readily available for inspection.

C. Equipment-Specific Tools: Where special testing equipment, tools and instruments are specific to a piece of equipment, are only available from the vendor, and are required in order to accomplish startup or Functional Testing, provide such equipment, tools, and instruments as part of the work at no extra cost to Owner; such equipment, tools, and instruments are to become the property of Owner.

D. Dataloggers: Independent equipment and software for monitoring flows, currents, status, pressures, etc. of equipment.
   1. Dataloggers required to for Functional Tests will be provided by the Commissioning Authority and will not become the property of Owner.

PART 3 EXECUTION

3.01 COMMISSIONING PLAN

A. Commissioning Authority will prepare the Commissioning Plan.
   1. Attend meetings called by the Commissioning Authority for purposes of completing the commissioning plan.
   2. Require attendance and participation of relevant subcontractors, installers, suppliers, and manufacturer representatives.

B. Contractor is responsible for compliance with the Commissioning Plan.

C. Commissioning Plan: The commissioning schedule, procedures, and coordination requirements for all parties in the commissioning process.

D. Commissioning Schedule:
   1. Submit anticipated dates of startup of each item of equipment and system to Commissioning Authority within 60 days after award of Contract.
   2. Re-submit anticipated startup dates monthly, but not less than 4 weeks prior to startup.
   3. Prefunctional Checklists and Functional Tests are to be performed in sequence from components, to subsystems, to systems.
   4. Provide sufficient notice to Commissioning Authority for delivery of relevant Checklists and Functional Test procedures, to avoid delay.

3.02 STARTUP PLANS AND REPORTS

A. Startup Plans: For each item of equipment and system for which the manufacturer provides a startup plan, submit the plan not less than 8 weeks prior to startup.

B. Startup Reports: For each item of equipment and system for which the manufacturer provides a startup checklist (or startup plan or field checkout sheet), document compliance by submitting the completed startup checklist prior to startup, signed and dated by responsible entity.

C. Submit directly to the Commissioning Authority.

3.03 PREFUNCTIONAL CHECKLISTS

A. A Prefunctional Checklist is required to be filled out for each item of equipment or other assembly specified to be commissioned.
   1. No sampling of identical or near-identical items is allowed.
   2. These checklists do not replace manufacturers' recommended startup checklists, regardless of apparent redundancy.
   3. Prefunctional Checklist forms will not be complete until after award of the contract; the following types of information will be gathered via the completed Checklist forms:
      a. Certification by installing contractor that the unit is properly installed, started up, and operating and ready for Functional Testing.
      b. Confirmation of receipt of each shop drawing and commissioning submittal specified, itemized by unit.
      c. Manufacturer, model number, and relevant capacity information; list information "as specified," "as submitted," and "as installed."
      d. Serial number of installed unit.
      e. List of inspections to be conducted to document proper installation prior to startup and Functional Testing; these will be primarily static inspections and procedures; for equipment and systems may include normal manufacturer’s start-up checklist items and minor testing.
      f. Sensor and actuator calibration information.
   4. PECI (Samples) found at http://www.peci.org/library/mcpgs.htm indicate anticipated level of detail for Prefunctional Checklists.

B. Contractor is responsible for filling out Prefunctional Checklists, after completion of installation and before startup; witnessing by the Commissioning Authority is not required unless otherwise specified.

1. Each line item without deficiency is to be witnessed, initialed, and dated by the actual witness; checklists are not complete until all line items are initialed and dated complete without deficiencies.
2. Checklists with incomplete items may be submitted for approval provided the Contractor attests that incomplete items do not preclude the performance of safe and reliable Functional Testing; re-submission of the Checklist is required upon completion of remaining items.
3. Individual Checklists may contain line items that are the responsibility of more than one installer; Contractor shall assign responsibility to appropriate installers or subcontractors, with identification recorded on the form.
4. If any Checklist line item is not relevant, record reasons on the form.
5. Contractor may independently perform startup inspections and/or tests, at Contractor's option.
6. Regardless of these reporting requirements, Contractor is responsible for correct startup and operation.
7. Submit completed Checklists to Commissioning Authority within two days of completion.

C. Commissioning Authority is responsible for furnishing the Prefunctional Checklists to Contractor.
1. Initial Drafts: Contractor is responsible for initial draft of Prefunctional Checklist where so indicated in Contract Documents.
2. Provide all additional information requested by Commissioning Authority to aid in preparation of checklists, such as shop drawing submittals, manufacturers' startup checklists, and O&M data.
3. Commissioning Authority may add any relevant items deemed necessary regardless of whether they are explicitly mentioned in Contract Documents or not.
4. When asked to review the proposed Checklists, do so in a timely manner.

D. Commissioning Authority Witnessing: Required for:
1. Each piece of primary equipment, unless sampling of multiple similar units is allowed by the commissioning plan.
2. A sampling of non-primary equipment, as allowed by the commissioning plan.

E. Deficiencies: Correct deficiencies and re-inspect or re-test, as applicable, at no extra cost to Owner.
1. If difficulty in correction would delay progress, report deficiency to the Commissioning Authority immediately.

3.04 FUNCTIONAL TESTS

A. A Functional Test is required for each item of equipment, system, or other assembly specified to be commissioned, unless sampling of multiple identical or near-identical units is allowed by the final test procedures.

B. Contractor is responsible for execution of required Functional Tests, after completion of Prefunctional Checklist and before closeout.

C. Commissioning Authority is responsible for witnessing and reporting results of Functional Tests, including preparation and completion of forms for that purpose.

D. Contractor is responsible for correction of deficiencies and re-testing at no extra cost to Owner; if a deficiency is not corrected and re-tested immediately, the Commissioning Authority will document the deficiency and the Contractor's stated intentions regarding correction.
1. Deficiencies are any condition in the installation or function of a component, piece of equipment or system that is not in compliance with Contract Documents or does not perform properly.
2. When the deficiency has been corrected, the Contractor completes the form certifying that the item is ready to be re-tested and returns the form to the Commissioning Authority; the Commissioning Authority will reschedule the test and the Contractor shall re-test.

3. Identical or Near-Identical Items: If 10 percent, or three, whichever is greater, of identical or near-identical items fail to perform due to material or manufacturing defect, all items will be considered defective; provide a proposal for correction within 2 weeks after notification of defect, including provision for testing sample installations prior to replacement of all items.
4. Contractor shall bear the cost of Owner and Commissioning Authority personnel time witnessing re-testing.
5. Contractor shall bear the cost of Owner and Commissioning Authority personnel time witnessing re-testing if the test failed due to failure to execute the relevant Prefunctional Checklist correctly; if the test failed for reasons that would not have been identified in the Prefunctional Checklist process, Contractor shall bear the cost of the second and subsequent re-tests.

E. Functional Test Procedures:
1. Some test procedures are included in Contract Documents; where Functional Test procedures are not included in Contract Documents, test procedures will be determined by the Commissioning Authority with input by and coordination with Contractor.
2. Examples of Functional Testing:
a. Test the dynamic function and operation of equipment and systems (rather than just components) using manual (direct observation) or monitoring methods under full operation (e.g., the chiller pump is tested interactively with the chiller functions to see if the pump ramps up and down to maintain the differential pressure setpoint).
b. Systems are tested under various modes, such as during low cooling or heating loads, high loads, component failures, unoccupied, varying outside air temperatures, fire alarm, power failure, etc.
c. Systems are run through all the HVAC control system’s sequences of operation and components are verified to be responding as the sequence's state.
d. Traditional air or water test and balancing (TAB) is not Functional Testing; spot checking of TAB by demonstration to the Commissioning Authority is Functional Testing.
3. PECI (Samples) found at http://www.peci.org/library/mcpgs.htm indicated anticipated level of detail for Functional Tests.

F. Deferred Functional Tests: Some tests may need to be performed later, after substantial completion, due to partial occupancy, equipment, seasonal requirements, design or other site conditions; performance of these tests remains the Contractor's responsibility regardless of timing.

3.05 SENSOR AND ACTUATOR CALIBRATION

A. Calibrate all field-installed temperature, relative humidity, carbon monoxide, carbon dioxide, and pressure sensors and gauges, and all actuators (dampers and valves) on this piece of equipment shall be calibrated. Sensors installed in the unit at the factory with calibration certification provided need not be field calibrated.

B. Calibrate using the methods described below; alternate methods may be used, if approved by Commissioning Authority and Owner beforehand. See PART 2 for test instrument requirements. Record methods used on the relevant Prefunctional Checklist or other suitable forms, documenting initial, intermediate and final results.

C. All Sensors:
1. Verify that sensor location is appropriate and away from potential causes of erratic operation.
2. Verify that sensors with shielded cable are grounded only at one end.
3. For sensor pairs that are used to determine a temperature or pressure difference, for temperature make sure they are reading within 0.2 degree F of each other, and for pressure, within tolerance equal to 2 percent of the reading, of each other.
4. Tolerances for critical applications may be tighter.

D. Sensors Without Transmitters - Standard Application:
   1. Make a reading with a calibrated test instrument within 6 inches of the site sensor.
   2. Verify that the sensor reading, via the permanent thermostat, gauge or building automation system, is within the tolerances in the table below of the instrument-measured value.
   3. If not, install offset, calibrate or replace sensor.

E. Sensors With Transmitters - Standard Application.
   1. Disconnect sensor.
   2. Connect a signal generator in place of sensor.
   3. Connect ammeter in series between transmitter and building automation system control panel.
   4. Using manufacturer's resistance-temperature data, simulate minimum desired temperature.
   5. Adjust transmitter potentiometer zero until 4 mA is read by the ammeter.
   6. Repeat for the maximum temperature matching 20 mA to the potentiometer span or maximum and verify at the building automation system.
   7. Record all values and recalibrate controller as necessary to comply with specified control ramps, reset schedules, proportional relationship, reset relationship and P/I reaction.
   8. Reconnect sensor.
   9. Make a reading with a calibrated test instrument within 6 inches of the site sensor.
   10. Verify that the sensor reading, via the permanent thermostat, gauge or building automation system, is within the tolerances in the table below of the instrument-measured value.
   11. If not, replace sensor and repeat.
   12. For pressure sensors, perform a similar process with a suitable signal generator.

F. Sensor Tolerances for Standard Applications: Plus/minus the following maximums:
   1. Watthour, Voltage, Amperage: 1 percent of design.
   2. Pressure, Air, Water, Gas: 3 percent of design.
   3. Air Temperatures (Outside Air, Space Air, Duct Air): 0.4 degrees F.
   4. Relative Humidity: 4 percent of design.
   5. Barometric Pressure: 0.1 inch of Hg.
   6. Flow Rate, Air: 10 percent of design.
   7. Flow Rate, Water: 4 percent of design.
   8. AHU Wet Bulb and Dew Point: 2.0 degrees F.

G. Critical Applications: For some applications more rigorous calibration techniques may be required for selected sensors. Describe any such methods used on an attached sheet.

H. Valve/Damper Stroke Setup and Check:
   1. For all valve/damper actuator positions checked, verify the actual position against the control system readout.
   2. Set pump/fan to normal operating mode.
   3. Command valve/damper closed; visually verify that valve/damper is closed and adjust output zero signal as required.
   4. Command valve/damper to open; verify position is full open and adjust output signal as required.
   5. Command valve/damper to a few intermediate positions.
   6. If actual valve/damper position does not reasonably correspond, replace actuator or add pilot positioner (for pneumatics).

I. Isolation Valve or System Valve Leak Check: For valves not associated with coils.
   1. With full pressure in the system, command valve closed.
   2. Use an ultra-sonic flow meter to detect flow or leakage.

3.06 TEST PROCEDURES - GENERAL

A. Provide skilled technicians to execute starting of equipment and to execute the Functional Tests. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problem-solving.

B. Provide all necessary materials and system modifications required to produce the flows, pressures, temperatures, and conditions necessary to execute the test according to the specified conditions. At completion of the test, return all affected equipment and systems to their pre-test condition.

C. Sampling: Where Functional Testing of fewer than the total number of multiple identical or near-identical items is explicitly permitted, perform sampling as follows:
   1. Identical Units: Defined as units with same application and sequence of operation; only minor size or capacity difference.
   2. Sampling is not allowed for:
      a. Major equipment.
      b. Life-safety-critical equipment.
      c. Prefunctional Checklist execution.
   3. XX = the percent of the group of identical equipment to be included in each sample; defined for specific type of equipment.
   4. YY = the percent of the sample that if failed will require another sample to be tested; defined for specific type of equipment.
   5. Randomly test at least XX percent of each group of identical equipment, but not less than three units. This constitutes the "first sample."
   6. If YY percent of the units in the first sample fail, test another XX percent of the remaining identical units.
   7. If YY percent of the units in the second sample fail, test all remaining identical units.
   8. If frequent failures occur, resulting in more troubleshooting than testing, the Commissioning Authority may stop the testing and require Contractor to perform and document a checkout of the remaining units prior to continuing testing.

D. Manual Testing: Use hand-held instruments, immediate control system readouts, or direct observation to verify performance (contrasted to analyzing monitored data taken over time to make the “observation”).

E. Simulating Conditions: Artificially create the necessary condition for the purpose of testing the response of a system; for example apply hot air to a space sensor using a hair dryer to see the response in a VAV box.

F. Simulating Signals: Disconnect the sensor and use a signal generator to send an amperage, resistance or pressure to the transducer and control system to simulate the sensor value.

G. Over-Writing Values: Change the sensor value known to the control system in the control system to see the response of the system; for example, change the outside air temperature value from 50 degrees F to 75 degrees F to verify economizer operation.

H. Indirect Indicators: Remote indicators of a response or condition, such as a reading from a control system screen reporting a damper to be 100 percent closed, are considered indirect indicators.

I. Monitoring: Record parameters (flow, current, status, pressure, etc.) of equipment operation using dataloggers or the trending capabilities of the relevant control systems; where monitoring of specific points is called for in Functional Test Procedures:
   1. All points that are monitored by the relevant control system shall be trended by Contractor; at the Commissioning Authority’s request, Contractor shall trend up to 20 percent more points than specified at no extra charge.
   2. Other points will be monitored by the Commissioning Authority using dataloggers.
   3. At the option of the Commissioning Authority, some control system monitoring may be replaced with datalogger monitoring.

4. Provide hard copies of monitored data in columnar format with time down left column and at least 5 columns of point values on same page.
5. Graphical output is desirable and is required for all output if the system can produce it.
6. Monitoring may be used to augment manual testing.

3.07 OPERATION AND MAINTENANCE MANUALS

A. See Section 01 78 00 - Closeout Submittals for additional requirements.

B. Add design intent documentation furnished by Architect to manuals prior to submission to Owner.

C. Submit manuals related to items that were commissioned to Commissioning Authority for review; make changes recommended by Commissioning Authority.

D. Commissioning Authority will add commissioning records to manuals after submission to Owner.

END OF SECTION 01 91 13

SECTION 02 41 00
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Building demolition excluding removal of hazardous materials and toxic substances.

B. Selective demolition of built site elements.

C. Selective demolition of building elements for alteration purposes.

D. Abandonment and removal of existing utilities and utility structures.

1.02 RELATED REQUIREMENTS

A. Section 01 10 00 - Summary: Limitations on Contractor's use of site and premises.

B. Section 01 10 00 - Summary: Sequencing and staging requirements.

C. Section 01 10 00 - Summary: Description of items to be salvaged or removed for re-use by Contractor.

D. Section 01 50 00 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

E. Section 01 57 13 - Temporary Erosion and Sediment Control.

F. Section 01 60 00 - Product Requirements: Handling and storage of items removed for salvage and relocation.

G. Section 01 70 00 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

H. Section 01 74 19 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.

I. Section 31 10 00 - Site Clearing: Vegetation and existing debris removal; earth stripping and stockpiling.

J. Section 31 22 00 - Grading: Rough and fine grading.

K. Section 31 23 23 - Fill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

L. Section 32 91 19 - Landscape Grading: Topsoil placement and finish grading.

M. Section 32 93 00 - Plants: Pruning of existing trees to remain.

1.03 DEFINITIONS

A. Demolition: Dismantle, raze, destroy or wreck any building or structure or any part thereof.

B. Remove: Detach or dismantle items from existing construction and dispose of them off site, unless items are indicated to be salvaged or reinstalled.

C. Remove and Salvage: Detach or dismantle items from existing construction in a manner to prevent damage. Clean, package, label and deliver salvaged items to Owner in ready-for-reuse condition.

D. Remove and Reinstall: Detach or dismantle items from existing construction in a manner to prevent damage. Clean and prepare for reuse and reinstall where indicated.

E. Existing to Remain: Designation for existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

1.04 REFERENCE STANDARDS

A. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Site Plan: Indicate:
   1. Vegetation to be protected.
   2. Areas for temporary construction and field offices.
   3. Areas for temporary and permanent placement of removed materials.

C. Demolition Plan: Submit demolition plan as required by OSHA and local AHJs.
   1. Indicate extent of demolition, removal sequencing, bracing and shoring, and location and construction of barricades and fences.
   2. Summary of safety procedures.
   3. Demolition firm qualifications.

D. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.06 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Company specializing in the type of work required.
   1. Minimum of five years of documented experience.

PART 2 PRODUCTS

2.01 MATERIALS

A. Fill Material: See Section 31 23 23.

PART 3 EXECUTION

3.01 DEMOLITION

A. Remove portions of the existing building in its entirety as noted in the construction documents. Removal includes but is not limited to, basements, crawl spaces, foundation walls and footings, and utilities..

B. Remove paving and curbs required to accomplish new work.

C. Remove all other paving and curbs within site boundaries.

D. Within area of new construction, remove foundation walls and footings in their entirety.

E. Outside area of new construction, remove foundation walls and footings in their entirety.

F. Remove concrete slabs on grade as indicated on drawings.

G. Remove manholes and manhole covers, curb inlets and catch basins.

H. Remove fences and gates.

I. Remove other items indicated, for salvage, relocation, and recycling.

J. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as required so that required rough grade elevations do not subside within one year after completion.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with requirements in Section 01 70 00.

B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Use of explosives is not permitted.
   3. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   4. Provide, erect, and maintain temporary barriers and security devices.

5. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
6. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
7. Do not close or obstruct roadways or sidewalks without permits from authority having jurisdiction.
8. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.
9. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon, or limit access to their property.

C. Do not begin removal until receipt of notification to proceed from Owner.

D. Do not begin removal until built elements to be salvaged or relocated have been removed.

E. Protect existing structures and other elements to remain in place and not removed.
1. Provide bracing and shoring.
2. Prevent movement or settlement of adjacent structures.
3. Stop work immediately if adjacent structures appear to be in danger.

F. Minimize production of dust due to demolition operations. Do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

G. Hazardous Materials:
1. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCBs, and mercury.

H. Perform demolition in a manner that maximizes salvage and recycling of materials.
1. Dismantle existing construction and separate materials.
2. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

I. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.03 EXISTING UTILITIES

A. Coordinate work with utility companies. Notify utilities before starting work, comply with their requirements, and obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone. Identify and mark, in same manner as other utilities to remain, utilities to be reconnected.

3.04 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Existing construction and utilities indicated on drawings are based on casual field observation and existing record documents only.
1. Verify construction and utility arrangements are as indicated.

2. Report discrepancies to Architect before disturbing existing installation.
3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Remove existing work as indicated and required to accomplish new work.
1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction indicated.
2. Remove items indicated on drawings.

C. Services including, but not limited to, HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications: Remove existing systems and equipment as indicated.
1. Maintain existing active systems to remain in operation, and maintain access to equipment and operational components.
2. 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.
3. Verify that abandoned services serve only abandoned facilities before removal.
4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings. Remove back to source of supply where possible, otherwise cap stub and tag with identification.

D. Protect existing work to remain.
1. Prevent movement of structure. Provide shoring and bracing as required.
2. Perform cutting to accomplish removal work neatly and as specified for cutting new work.
3. Repair adjacent construction and finishes damaged during removal work.
4. Patch to match new work.

3.05 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Remove materials not to be reused on site; comply with requirements of Section 01 74 19 - Waste Management.

C. Leave site in clean condition, ready for subsequent work.

D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION 02 41 00

SECTION 03 05 16
UNDERSLAB VAPOR BARRIER - STEGO

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sheet vapor barrier under concrete slabs on grade.

1.02 RELATED REQUIREMENTS

A. Section 03 20 00 - Concrete Reinforcing.

B. Section 03 30 00 - Cast-in-Place Concrete: Preparation of subgrade, granular fill, placement of concrete.

1.03 REFERENCE STANDARDS

A. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2018a.

B. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017 (Reapproved 2023).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit manufacturers' data on manufactured products.

C. Manufacturer's Installation Instructions: Indicate installation procedures and interface required with adjacent construction.

PART 2 PRODUCTS

2.01 MATERIALS

A. Underslab Vapor Barrier:
   1. Water Vapor Permeance: Not more than 0.010 perms, maximum.
   2. Thickness: 15 mils.
   3. Product:
      a. Stego Industries LLC; Stego Wrap Vapor Barrier (15-mil): www.stegoindustries.com/#sle.

B. Accessory Products: Vapor barrier manufacturer's recommended tape, adhesive, mastic, etc., for sealing seams and penetrations in vapor barrier.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surface over which vapor barrier is to be installed is complete and ready before proceeding with installation of vapor barrier.

3.02 INSTALLATION

A. Install vapor barrier in accordance with manufacturer's instructions and ASTM E1643.

B. Install vapor barrier under interior slabs on grade; lap sheet over footings and seal to foundation walls.

C. Lap joints minimum 6 inches.

D. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions.

E. No penetration of vapor barrier is allowed except for reinforcing steel and permanent utilities.

F. Repair damaged vapor retarder before covering with other materials.

END OF SECTION 03 05 16

SECTION 03 10 00
CONCRETE FORMWORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Design, construction and treatment of formwork and related accessories to confine and shape concrete to the required dimensions.

B. Installation of embedded items such as waterstops, dovetail anchors, flashing reglets, shelf angles, and PVC weeps.

C. Structural notes indicated on the drawings regarding concrete formwork shall be considered a part of this specification.

1.02 RELATED WORK

A. Pertinent Sections of Division 01.

B. Section 03 20 00 - Concrete Reinforcement.

C. Section 03 30 00 - Cast-in-Place Concrete.

1.03 REFERENCES

A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards except where more stringent requirements are shown or specified. Where provisions of the pertinent codes and standards conflict with this specification, the more stringent provision shall govern.

1. ACI 117 - Specification for Tolerances for Concrete Construction and Materials.
2. ACI 301 - Specifications for Structural Concrete.
3. ACI 318 - Building Code Requirements for Structural Concrete.
4. ACI 347 - Guide to Formwork for Concrete.
5. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
6. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
7. NIST - PS 1: Structural Plywood

1.04 DESIGN REQUIREMENTS

A. Design and engineering of formwork is the responsibility of the Contractor. Design, engineer and construct formwork, shoring, and bracing to conform to Contract Documents and in accordance with . Formwork design shall be under direct supervision of a Structural engineer experienced in the design of this work and licensed in the State where the project is located. Design for construction loads, lateral pressure, and requirements of the applicable building code to conform to the required shape, line, and dimensions. Contractor is responsible for formwork camber calculations.

B. Drawings show the design requirements and dimensions for structural strength, but structural drawings do not show all detail dimensions to fit intricate architectural and mechanical detail. Contractor shall construct the concrete work so that it will conform to the clearance required by the architectural, mechanical, and electrical design.

C. Maximum deflection of facing materials forming concrete surfaces exposed to view shall be 1/240 of the center-to-center span between structural members of the formwork.

D. Carry vertical and lateral loads to the ground by a formwork system and in-place construction that has attained adequate strength for that purpose. Where adequate foundations for shores and struts cannot be secured, provide trussed supports.

1.05 SUBMITTALS

A. Product Data: Submit manufacturer's product data, installation instructions and specifications for each of the following:

1. Waterstop profiles
2. Form sealer
3. Form release agent(s), including certification that agent is compatible with finish
4. Form ties and spreaders
5. Void form

B. Testing for Formwork Removal: When methods other than cylinder tests are proposed for determining time for formwork removal, submit data on methods for approval.

C. Pour Sequence: Submit sequence of concrete operations for supported structural slab, beams, columns, and walls.

D. Shoring and Re-shoring: Submit proposed schedule and sequence of stripping formwork, shoring removal, and installing and removing reshoring.

E. Construction Joints: Submit layout of construction joints and details of construction joints.

1.06 COORDINATION

A. Coordinate with other sections of work that require attachment of components to formwork.

B. If formwork is placed after reinforcement, resulting in insufficient concrete cover to reinforcement, request instructions from the Owner's Representative or Architect or Structural Engineer before proceeding.

PART 2 - PRODUCTS

2.01 MATERIALS AND ACCESSORIES

A. Formwork Accessories: Use commercially manufactured accessories for formwork accessories partially or completely embedded in concrete, including ties and hangers.

B. Sealer: Clear, penetrating, synthetic resin sealer.

C. Formwork Release Agent: Use commercially manufactured form release agents that will prevent formwork absorption of moisture, prevent bond with concrete, and will not stain the concrete surface. Reapply to cleaned forms before each reuse. Formwork release agent shall be compatible with paint or any other finish applied to the concrete; submit data indicating compatibility.

D. Waterstops: Waterstops shall be a flexible butyl rubber and bentonite clay compound that swells upon contact with water.

1. Manufacturers:

a. CETCO - Waterstop RX
b. Greenstreak - Swellstop
c. J.P. Specialties - Earth Shield (Type 20 & 23) Waterstop

E. Form Material:

1. No aluminum shall be allowed in the concrete work unless coated to prevent aluminum-concrete reaction.
2. Concrete form materials must be used in a manner to provide the surface finish specified.
3. Design formwork in accordance with the provisions of the building code or the following standards if not covered in the building code:

a. Wood - AWC "National Design Specification".
b. Plywood - American Plywood Association "Plywood Design Specification".
c. Steel - AISC "Manual of Steel Construction".
d. Aluminum - Aluminum Association "Aluminum Construction Manual"
e. Concrete - ACI 318.
f. Other materials - as directed by manufacturer.

F. Chamfer Strips:

1. Chamfer strips shall be the size as indicated on the drawings. Provide in maximum possible lengths.

2.02 FORM FINISHES

A. Rough Form Finish:

1. Concrete surfaces not exposed to view in the finished work shall have a rough-form finish. No form-facing material is specified for rough-form finish.
2. Set and maintain forms so finished concrete dimensions shall conform to the tolerances. Rough form finish is Designated Surface Finish-1.0 from ACI 301, except that surface tolerance Class C is required as specified in ACI 117.

B. Smooth Form Finish:

1. Concrete surfaces exposed to view in the finished work or surfaces to receive finishes of any type (paint, textured paint, etc.) shall have a smooth form finish. Form-facing material shall be plywood, tempered concrete-form-grade hardboard, metal, plastic, paper, or other acceptable material capable of producing the desired finish. Form-facing material shall produce a smooth, uniform texture on the concrete. Do not use form facing material with raised grain, torn surfaces, worn edges, patches, dents, or other defects that might impair the texture of the concrete surfaces.

2. Set and maintain forms so finished concrete dimensions shall conform to the tolerances. Smooth form finish is Designated Surface Finish-3.0 from ACI 301, including surface tolerance Class A as specified in ACI 117.

C. Patching and repairing concrete finishes are specified under Section 03 30 00.

2.03 FABRICATION AND MANUFACTURE

A. Form Ties and Spreaders: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms, hold inner and outer forms for vertical concrete together, and to prevent spalling of concrete on removal.

1. Furnish units that will leave no corrodible metal closer than 1-1/2 inch to the plane of the exposed concrete surface.
2. Furnish ties that, when removed, will leave holes not larger than 1 inch in diameter in the concrete surface.
3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.
4. At horizontal pour lines, locate ties not more than 6" below the pour lines. Tighten after concrete has set and before the next pour is made.
5. For exposed concrete surfaces, provide form ties of removable type with permanent plugs and a system approved by the Architect for fixing the plugs in place.

B. Waterstops: Fabricate pieces of premolded waterstop with a maximum practicable length to hold the number of end joints to a minimum. Fabricate joints in waterstops in accordance with the manufacturer's recommendations.

PART 3 - EXECUTION

3.01 CONSTRUCTION OF TEMPORARY FORMWORK

A. In accordance with ACI 301, construct formwork:

1. Design, erect, shore, brace, and maintain formwork to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until the concrete structure can support such loads.
2. Obtain approval before framing openings in structural members not indicated on the drawings.

B. Fabricate forms for easy removal without hammering or prying against concrete surfaces.

1. Provide crush or wrecking plates where stripping may damage cast concrete surfaces.
2. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only.
3. Chamfer wood inserts for forming keyways, reglets, recesses, and the like to allow wood to swell without spalling concrete and to ensure easy removal.

C. Falsework:

1. Provide positive means of adjustment (wedges or jacks) of shores and struts. Do not adjust formwork after concrete has taken its initial set. Brace formwork securely against lateral deflection and lateral instability.

2. To maintain specified tolerances, camber formwork to compensate for anticipated deflections in formwork prior to hardening of concrete. Formwork camber calculations are the responsibility of the formwork designer. Set formwork and intermediate screed strips for slabs accurately to produce designated elevations and contours of the finished surface prior to removal of formwork. Ensure edge forms and screed strips are sufficiently strong to support vibrating screeds or roller pipe screeds when the finish specified requires the use of such equipment.
3. When formwork is cambered, set screeds to a like camber to maintain required concrete thickness.
4. Verify lines, levels, and centers before proceeding with formwork. Ensure dimensions agree with the drawings.
5. Fasten form wedges in place after final adjustment of forms and prior to concrete placement.
6. Anchor formwork to shores, supporting surfaces, or members to prevent upward or lateral movement of the formwork system during concrete placement.
7. Securely brace and shore forms to prevent displacement and to safely support construction loads.
8. Construct forms plumb and straight to conform to slopes, lines, and dimensions shown.
9. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
10. Provide runways for moving equipment and support runways directly on formwork or structural member without resting on the reinforcing steel.

D. Where end-of-work sequence requires a joint in the concrete, provide adequately designed additional formwork. Extend reinforcement through formwork and key joints as indicated on the drawings. Location of the construction joint is subject to approval by the Architect and the Structural Engineer.

E. Forms for Exposed Concrete:

1. At construction joints, lap contact surface of the form sheathing for flush surfaces exposed to view over the hardened concrete in the previous placement by not more than 1 inch. Ensure formwork is held firmly against hardened concrete to prevent offsets or loss of mortar at construction joints and to maintain a true surface.
2. Provide watertight formwork when architectural exposed concrete is specified.
3. Unless specified in the Contract Documents, construct formwork so concrete surfaces conform to tolerance limits. The class of surface for offset between adjacent pieces of formwork facing material shall be Class C, unless specified otherwise.
4. Do not use metal cover plates for patching holes or defects in forms.
5. Provide sharp, clean corners at intersecting plans, without visible edges or offsets.
6. Fill all unwanted joint openings with specified joint filler and finish flush to match adjacent form surfaces.

F. Construct formwork for wall openings to facilitate removal and to counteract swelling of wood formwork. Keep wood forms wet as necessary to prevent shrinkage.

G. Do not use rust-stained steel form-facing material.

H. Provide temporary openings at the base of column and wall formwork and at other points where necessary to facilitate cleaning and inspection.

I. Unless noted otherwise, all footings shall be centered under walls, piers, or columns.

J. Provisions for Other Trades:

1. Place sleeves, inserts, anchors, and embedded items required for adjoining work or for support of adjoining work prior to concrete placement.
2. Position and support expansion joint material and other embedded items to prevent displacement. Fill voids in sleeves, inserts, and anchor slots temporarily with readily removable material to prevent entry of concrete into voids.

K. Projecting corners of beams, walls and columns shall be formed with a 3/4-inch chamfer, unless noted otherwise on architectural drawings.

L. Cleaning:

1. Clean surfaces of formwork and embedded materials of mortar, grout, and foreign material before concrete is placed.
2. Cover surfaces of formwork with acceptable formwork release agent. Apply form release agent before placing reinforcing steel and concrete according to manufacturer's written instructions. Do not allow formwork release agent to puddle in forms. Do not allow formwork release agent to contact reinforcing steel or hardened concrete against which fresh concrete is to be placed. Do not apply form release agent to concrete surfaces receiving special finishes or applied coverings affected by the agent.
3. Clean and inspect formwork immediately before concrete is placed.

M. Provide forms for concrete work adjacent to earth banks including sides of footings, except where footing excavation is vertical rock cut.

N. Install void forms in accordance with manufacturer's recommendations. Protect forms from moisture or crushing.

3.02 COORDINATION

A. Install all required pipe sleeves, cavities or slots. Notify appropriate trades in due time so they may furnish information and make necessary installations. Check sizes, location and alignment of all openings, frames and other work, which are to be built-in including electrical boxes and conduit.

B. Layout the run of partitions and establish location of openings so other trades may properly locate their work.

C. Core drilling concrete is not permitted unless noted otherwise or approved in writing by the Architect. Notify the Architect in advance of conditions not shown on the drawings.

3.03 INSTALLATION OF EMBEDDED ITEMS

A. Built-In Items:

1. Confirm with Architect that all materials to be embedded are suitable for embedment in concrete.
2. Build in anchors, inserts, and other devices indicated or required for various portions of work.
3. Build in sleeves, thimbles, and other items furnished or set in place by other trades.
4. Accurately position and support all embedded items prior to concrete placement. Secure embedded items against displacement during concrete placement operations.
5. Fill voids with readily removable material to prevent entry of concrete into voids.
6. Mechanical and Electrical shall provide and set required sleeves.

7. Coordinate setting of all embedded items.

B. Waterstops:

1. Locate waterstops in joints where indicated on the drawings.
2. Build in waterstops using longest unbroken lengths possible to hold the number of end splices to a minimum.
3. Form splices and intersections strictly according to the manufacturer's instructions so waterstops are continuous and develop an effective watertight joint.
4. In general, waterstops should be located just behind outermost layer of reinforcing. Do not place waterstops closer than 2" from face of concrete.

3.04 TOLERANCES

A. Construction formwork to maintain tolerances required by ACI 301 and ACI 117.

3.05 REMOVAL OF FORMS

A. When removal of formwork or reshoring is based on concrete reaching a specified compressive strength, concrete will be presumed to have reached this strength when either of the following requirements has been met:

1. Test cylinders, molded and cured under the same conditions for moisture and temperature as used for the concrete they represent, have reached the specified compressive strength.
2. Concrete has been cured in accordance with the specifications for the same length of time as laboratory-cured cylinders, which have reached the specified strength. Determine the length of time concrete has been cured in the structure by the cumulative number of days or fractions thereof, not necessarily consecutive, during which the temperature of the air in contact with the concrete is above 50F and the concrete has been damp or thoroughly sealed from evaporation and loss of moisture.

B. Forms shall remain in place for the following periods of time. These periods represent cumulative number days or hours, not necessarily consecutive, during which the temperature of the air surrounding the concrete is above 50F:

1. Walls, Grade Beams, Columns, Sides of Beams, Girders and Footings: 67% specified compressive strength or minimum 24 hours.

C. When finishing is required, remove forms as soon as removal operations will not damage concrete.

D. Remove top forms on sloping surfaces of concrete as soon as removal will not allow concrete to sag. Perform needed repairs or treatment required at once and follow immediately with specified curing.

E. Loosen wood formwork for wall openings when this can be accomplished without causing damage to concrete.

F. Do not allow removal of formwork to damage the fresh concrete for columns, walls, sides of beams, and other parts supporting the weight of the concrete. Perform needed repair and treatment required on vertical surfaces at once and follow immediately with specified curing.

3.06 RESHORING

A. Shoring must be provided for a sufficient number of floors to develop the necessary capacity to support the imposed loads without excessive stress or deflection.

1. In multistory construction, extend shoring or reshoring over a sufficient number of stories to distribute loads in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.
2. Plan sequence of shore removal and reshoring to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.07 FASTENER REMOVAL

A. Remove all protruding fasteners left as a result of securing inserts to forms by Contractor responsible for insert.

B. Cutting flush with surface is not acceptable.

C. Patch exposed concrete surfaces if damaged during fastener removal process.

3.08 REMOVING AND REUSING FORMS

A. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

B. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by the Architect.

END OF SECTION 03 10 00

SECTION 03 20 00
CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Fabrication and placement of reinforcing steel for concrete and all related accessories.

B. Reinforcing steel for use in bond beams, masonry columns, and lintels is specified in Division 4 and is not a part of the work in this section.

C. Structural notes indicated on the drawings regarding concrete reinforcement shall be considered a part of this specification.

1.02 RELATED WORK

A. Pertinent Sections of Division 01.

B. Section 03 10 00 - Concrete Formwork.

C. Section 03 30 00 - Cast-in-Place Concrete.

1.03 REFERENCES

A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified. Where provisions of other pertinent codes and standards conflict with this specification, the more stringent provision shall govern.

1. ACI 117 - Specification for Tolerances for Concrete Construction and Materials.
2. ACI 301 - Specifications for Structural Concrete.
3. ACI 318 - Building Code Requirements for Structural Concrete.
4. ACI SP-066 - ACI Detailing Manual.
5. ASTM A184 - Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement.
6. ASTM A370 - Standard Test Methods and Definitions for Mechanical Testing of Steel Products
7. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
8. ASTM A706 - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
9. ASTM D3963 - Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars.
10. AWS D1.4 - Structural Welding Code - Reinforcing Steel.
11. AWD D1.8 - Structural Welding Code - Seismic Supplement.
12. Concrete Reinforcing Steel Institute (CRSI) - Manual of Standard Practice.

1.04 SUBMITTALS

A. Placing Drawings: Submit placing drawings showing fabrication dimensions and locations for placement of reinforcement and reinforcement accessories. Indicate bar sizes, spacing, locations, and quantities of reinforcing steel, bending and cutting diagrams, anchors, and supporting and spacing devices. Dowels shall be shown in placing drawings for the element that is to be placed first. Reinforcing steel descriptions or shop drawings shall be inch-pound sizes.

B. Product Data: Submit product data sheets for all specified products.

C. Manufacturer's Certifications:

1. Submit mill certifications at time of delivery.

D. Splices: Submit request for splices not indicated in the Contract Documents. Request shall indicate locations, types, and lengths of splices for approval.

E. Field Bending: Submit requests and procedure for field bending or straightening of reinforcement partially embedded in concrete not described in the Contract Documents.

F. Reinforcement Relocation: Submit requests to adjust reinforcement spacing necessitated by conflicts with other reinforcement, conduits, etc. for approval.

G. Mechanical Connections: Submit request for the use of mechanical connections not shown on the project drawings. Include engineering data on proprietary connection devices for approval.

H. Welding Procedure Specifications: For welding of reinforcing steel, include designations of processes (e.g. SMAW, GAMW, FCAW, etc.), weld symbols, and details. All WPS shall be qualified by current Procedure Qualification Record (PQR) per AWS D1.4 and approved by the Structural Engineer and HCAI.

I. Alternative Reinforcement: Submit request to relocate any reinforcing bars that exceeds placement tolerances.

1.05 COORDINATION

A. Coordinate reinforcement installation with the placement of formwork and other embedded items such as inserts, conduit, pipe sleeves, drains, metal supports, anchor rods, etc.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver reinforcement to the jobsite in bundles sorted and labeled with durable tags indicating bar size, length, and shop drawing mark. Bundles shall also bear testing laboratory tags indicating identified steel.

B. Store elevated clear of ground and protect at all times from contamination and deterioration.

C. Prevent bending, coating with earth, oil, or other material, or otherwise damaging the reinforcement.

D. Store welding electrodes in accordance with the requirements of AWS D1.4.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Bar Deformations: Bars used for reinforcement shall be deformed except column spirals and welded wire reinforcement, which may be plain.

B. Reinforcing Steel: Reinforcing steel shall conform to the ASTM standard and grade indicated in the General Notes on the drawings.

C. Welded Wire Reinforcement: Welded wire reinforcement shall conform to the ASTM standard indicated in the General Notes on the drawings.

D. Joint Dowel Bars: Plain-steel bars. Cut bars true to length with square ends and free of burrs.

E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, precast concrete, or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected or CRSI Class 2 stainless-steel bar supports.
2. Concrete cast against earth: Bars may be supported by precast concrete bricks or approved prefabricated wire bar supports complying with CRSI recommendations with footpads large enough to support the weight of the bars and construction traffic without being pushed into underlying grade. Precast concrete blocks shall have a minimum compressive strength of 6,000 psi.

2.02 FABRICATION

A. Fabrication Tolerances: Reinforcing steel shall be shop fabricated within tolerances according to ACI 117 and other applicable codes, and shall conform in size, shape, quantity, dimensions, etc. to the construction drawings and approved shop drawings.

B. Bar Condition: Bars shall be free from mill scale, excessive rust, and other coatings, which would reduce or destroy the bond with the concrete. Wipe oil from forms before reinforcement is placed on or adjacent to so that oil will not be tracked over or in any way come into contact with the reinforcement.

C. Bars Bending: Bars shall be bent cold, and no method of fabrication shall be used which would be injurious to the material. Heating of bars for bending is not permitted.

D. Identification: After fabrication, bars shall be sorted, bundled, and tagged with metal tags bearing the bar mark before delivery to the jobsite.

E. Reinforcing for continuous footings shall extend into spread footings a minimum of 2'-0".

F. Dowels between footings and walls or columns shall be the same grade, size and spacing or number as the vertical reinforcing respectively, unless noted otherwise.

PART 3 - EXECUTION

3.01 PLACING

A. Reinforcement Relocation: When necessary to move reinforcement beyond the specified spacing to avoid interference with other reinforcement, or embedded items, submit resulting arrangement of reinforcement to Structural Engineer for approval.

B. Reinforcement Cutting: Cutting of reinforcement which conflicts with embedded objects is not acceptable.

C. Welded Wire Reinforcement: Extend welded wire reinforcement to within 1 inch of the concrete edge. Lap edges and ends of fabric sheets a minimum of two panels or 12" minimum. Lace edges with 16-gauge tie wire. Support welded wire reinforcement during placing of concrete to assure required positioning in the slab. Do not place wire reinforcement on grade or metal deck and raise into position in freshly-placed concrete.

D. Wire Tie Orientation: Set wire ties so ends are directed away from the concrete surface.

E. Slab on Grade Reinforcement Placement: Place shrinkage and temperature reinforcement 1/3 of the slab thickness from the top surface of the slabs on grade unless noted otherwise on the drawings.

F. Do not cut, displace, or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

G. Support for Reinforcement: Unless noted otherwise, supports for reinforcement shall have Class 2 protection as defined in the CRSI Manual of Standard Practice. Submit data on supports indicating class of protection at all different locations for approval. Supports shall not be used as bases for runways for concrete-conveying equipment and similar construction loads. Do not place reinforcing bars more than 2" beyond last leg of any continuous bar support.

H. Support for Bars in Concrete Cast on Ground: Bar supports for slabs on grade, grade beams, footings, and all other concrete cast directly onto grade shall be supported at an average spacing of 4 feet or less in each direction.

I. Securing Reinforcing Bars: All bars must be placed, spaced, secured, and supported prior to casting concrete. Bars embedded in hardened or partially hardened concrete shall not be bent unless approved in writing prior to placement by the Structural Engineer.

J. Foot Traffic: Restrict foot traffic over the slab on grade reinforcing after it has been properly positioned.

K. Reinforcement at Expansion Joints: Do not continue reinforcement or other embedded metal items bonded to concrete through expansion joints. Dowels bonded on only one side of a joint and waterstops may extend through joint.

L. Pumping Concrete: When using a pump to place concrete, pump hose shall be supported directly on forms. Do not allow hose to rest on reinforcing bars if doing so could cause displacement of bars.

END OF SECTION 03 20 00

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. All items required for executing and completing the cast-in-place concrete work and related work shown on the drawings or specified herein. Work shall include installation of items furnished in other sections of these specifications.

B. Concrete paving, walks, and curbs are specified in Division 3 or 32.

C. Structural notes indicated on the drawings regarding cast-in-place concrete shall be considered a part of this specification.

1.02 RELATED WORK

A. Pertinent Sections of Division 01.

B. Section 03 10 00 - Concrete Formwork.

C. Section 03 20 00 - Concrete Reinforcement.

D. Section 05 31 00 - Steel Deck.

1.03 REFERENCES

A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified. Where any provision of other pertinent codes and standards conflict with this specification, the more stringent provision shall govern.

1. ACI 117 - Specification for Tolerances for Concrete Construction and Materials.
2. ACI 301 - Specifications for Structural Concrete.
3. ACI 302.1R - Guide to Concrete Floor and Slab Construction.
4. ACI 302.2R - Guide for Concrete Slabs that Received Moisture-Sensitive Flooring Materials.
5. ACI 303.1 - Standard Specification for Cast-in-Place Architectural Concrete.
6. ACI 304R - Guide to Measuring, Mixing, Transporting, and Placing Concrete.
7. ACI 305.1 - Specification for Hot Weather Concreting.
8. ACI 306.1 - Guide to Cold Weather Concreting.
9. ACI 309R - Guide for Consolidation of Concrete.
10. ACI 318 - Building Code Requirements for Structural Concrete.
11. ACI 347R - Guide to Formwork for Concrete.
12. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
13. ASTM C33 - Standard Specification for Concrete Aggregates.
14. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
15. ASTM C42 - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.

16. ASTM C88 - Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
17. ASTM C94 - Standard Specification for Ready-Mixed Concrete.
18. ASTM C131 - Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
19. ASTM C138 - Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
20. ASTM C143 - Standard Test Method for Slump of Hydraulic Cement Concrete.
21. ASTM C150 - Standard Specification for Portland Cement.
22. ASTM C157 - Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete
23. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.
24. ASTM C173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
25. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
26. ASTM C595 – Standard Specification for Blended Hydraulic Cements.
27. ASTM C1064 - Standard Test Method for Temperature of Freshly Mixed Hydraulic Cement Concrete.
28. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation.
29. ASTM C1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
30. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting.
31. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
32. ASTM E1155 - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers.
33. Concrete Reinforcing Steel Institute (CRSI) - Manual of Standard Practice.

1.04 SAMPLING AND TESTING REQUIREMENTS

A. Maintain records verifying materials used are of the specified and accepted types and sizes and are in conformance with the requirements of the Contract Documents.

B. Use of testing services will not relieve the Contractor of the responsibility to furnish materials and construction in full compliance with the Contract Documents.

C. Take samples of fresh concrete at the job site for each mix design placed each day. Sampling and testing shall be done after the final addition and proper mixing of any water or admixtures that are added on site.

1. Personnel and testing equipment shall meet the requirements of ASTM E329.
2. Testing Frequency: Obtain at least one composite sample for each 150 cu. yd. or 5,000 sq. ft. of surface area, whichever is less or fraction thereof of each concrete mixture placed each day.

    a. On a given project, if the total volume of concrete is such that the frequency of testing required above would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.

3. A strength test shall be the average of the strengths of two 6x12 inch or three 4x8 inch cylinders made from the same sample of concrete and tested at 28 days.

D. For each sample of fresh concrete, perform the following duties:

1. Measure and record slump in accordance with ASTM C143.
2. Measure and record temperature in accordance with ASTM C1064.

    a. Provide one test hourly when air temperature is 40F and below and when 80F and above, and one test for each composite sample.

3. Measure and record air content by volume in accordance with either ASTM C231 or ASTM C173.
4. Measure and record shrinkage percentage in accordance with ASTM C157, with the following modifications:

    a. Wet cure specimens for a period of seven (7) days (including the period of time the specimens are in the mold). Wet cure may be achieved through storage in a moist cabinet or room in accordance with ASTM C511, or through storage in lime-saturated water.
    b. Slump of concrete for testing shall match job requirements and need not be limited to the restrictions as stated in ASTM C157.
    c. Report results in accordance with ASTM C157 at 0, 7, 14 and 28 days of drying.

5. Mold three 6x12 inch or four 4x8 inch cylinders (laboratory cylinders) in accordance with ASTM C31 to be laboratory-cured. Protect from moisture loss and maintain at 60F to 80F for 24 to 48 hours before moving. Deliver cylinders to testing laboratory for curing and testing.
6. Mold one cylinder (field cylinder) in accordance with ASTM C31 to be field-cured. Field cylinder shall be placed as near as possible to the in-place concrete from which it was taken, protected, and cured in the same manner. Deliver field-cured cylinder to testing laboratory, and measure and record compressive strength in accordance with ASTM C39. Field cylinder shall be used to determine if concrete footings, walls, or piers have reached the required compressive strength for steel erection to begin.

E. Measure and record compressive strength in accordance with ASTM C39 for laboratory cylinders. Test one laboratory cylinder at 7 days and all other cylinders at 28 days. Acceptance is based on the average of the two 6x12 inch or three 4x8 inch laboratory cured 28-day tests. Notify Architect in the event strength levels do not meet the acceptance requirements of ACI 318.

1. Any additional cylinders molded for Contractor to have a compressive strength test done before seven days shall be at the Contractor's expense.

F. Prepare and submit test reports to the Architect, Engineer, Contractor and Supplier. Reports shall be completed and furnished within 48 hours of testing. Refer to description in Submittals.

G. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

H. Should the strength of any grade of concrete for any portion of work, as indicated by molded test cylinders, fall below the minimum 28-day compressive strength specified on the drawings, upon approval of the Structural Engineer, the concrete supplier shall adjust the concrete mix for remaining portion of construction so that the resulting concrete meets the minimum strength requirements.

1.05 SUBMITTALS

A. Concrete Materials: Submit information on concrete materials as listed below.

1. Cementitious Materials: Submit type, class, producer name, and certification not more than 90 days old of compliance with applicable ASTM standard.
2. Aggregates: Submit type, pit or quarry location, producer name, gradations, specific gravity, water content, and certification not more than 90 days old.
3. Admixtures: Submit product data sheet. Product data shall include: dosages and performance data, brand names, producers, chloride ion concentrations, and certifications of compliance with applicable ASTM standard. Certifications shall not be more than 90 days old.
4. Water: Submit name of source.

B. Product Data: Prepare and submit product and performance data for materials and accessories, including patching compounds, joint systems, curing compounds, finish materials, and other concrete related items.

C. Testing Agency Qualifications: When requested, the proposed testing agencies shall submit data on qualifications for acceptance.

D. Concrete Mix Design:

1. Concrete mix design submittals shall be submitted to the Structural Engineer and HCAI for review and approval at least 14 days prior to placing concrete.
2. Obtain Structural Engineer and HCAI approval for each mix design prior to use, including new mix designs required to be prepared should there be a change in materials being used.
3. Submit concrete mixture proportions and characteristics for each concrete mix. Include standard deviation analysis or trial batch data with mix design. Submit historical field test data to demonstrate the average compressive strength for approval. Concrete mix proportions, materials, and handling methods for field test data or trial batches shall be the same as used for the work. Include the following information for each mix design:

    a. Water/cementitious materials ratio.
    b. Slump per ASTM C143
    c. Air content per ASTM C231 or ASTM C173
    d. Unit weight of concrete per ASTM C138
    e. Compressive strength at 28 days per ASTM C39
    f. Shrinkage (length change) as measured in accordance with ASTM C157 with the modifications included in Section 1.3.

4. If trial batches are used, submit representative samples of each proposed ingredient to independent testing laboratory for use in preparation of mix design.
5. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments. Indicate amounts of mix water to be withheld for later addition at Project site.
6. Provide a record copy of the final mix designs and test results to the testing agency prior to commencement of the concrete work.

E. Slab-on-Grade Joint Layout: Submit drawings for proposed slab-on-grade control joint and construction joint layout for approval.

F. Slab Coordination Drawings: Submit drawings indicating coordinated locations of MEP penetrations, sleeves, openings, in-slab conduit/duct (if allowed), embeds, cast-in anchors, and other items embedded or penetrating elevated structural slabs.

G. Construction Sequence Submittal: Contractor shall submit an elevated slab construction sequence indicating construction joints and the pour sequence.

H. Test Reports: Submit laboratory test reports for concrete materials, mix design, compressive strength, slump, air content, and temperature. Each report shall indicate date of sampling, date of test, mix design, and location of concrete in structure.

I. Repair Methods: When stains, rust, efflorescence, and surface deposits must be removed, submit the proposed method of removal.

J. Certificates: Submit written certification regarding the design mix from the ready-mix supplier and the admixture manufacturer stating all concrete and admixtures do not contain chloride ions in excess of concentrations specified herein.

K. Placement Notification: Notify the Architect at least 24 hours in advance of concrete placement.

L. Adjustments: Submit any adjustments to mixture proportions or changes in materials, suppliers, or sources, along with supporting documentation, during the course of the work.

M. Cold Weather Procedure Submittal: Refer to Cold Weather Concreting article in Part 3 for more information.

N. Record Documents: Accurately record actual locations of embedded utilities and components that are concealed from view.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Cementitious Materials: Store cementitious materials in dry weather tight buildings, bins, or silos that exclude contaminants.

B. Aggregates: Store and handle aggregate in a manner that will avoid segregation and prevent contamination with other materials or other sizes of aggregates. Store aggregates so as to drain freely.

C. Admixtures: Protect stored admixtures against contamination, evaporation, or damage. Protect liquid admixtures from freezing and temperature changes, which would adversely affect their performance. Handle chemical admixtures in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.01 CONCRETE MATERIALS

A. Portland Limestone Cement: Portland limestone cement (PLC) shall conform to ASTM C595, Type IL. Use one brand of PLC throughout project, unless approved in writing by the Engineer. PLC used in concrete shall be the same as used in the concrete represented by the submitted field test data or used in the trial mixtures. Maintain consistent PLC color throughout project unless directed otherwise by architectural requirements.

1. Total replacement of Portland limestone cement by supplementary cementitious materials in design mixture shall not exceed 50% (by weight).

B. Supplementary Cementitious Materials

1. Fly Ash: Fly ash shall conform to ASTM C618, Class C or Class F. Replacement of Portland cement by fly ash shall not exceed the following (percentages are by weight):

    a. Concrete Flatwork: 20 percent.
    b. Mass Concrete (more than two feet thick): 50 percent.
    c. All other concrete: 25 percent.
    d. Concrete to be placed in cold weather as defined herein: No fly ash allowed unless the cold weather procedure submitted has compensated for the increased setting time and decreased rate of strength gain due to cold weather and fly ash.

2. Slag Cement: ASTM C989, Grade 100 or 120.

    a. Ground Granulated Blast-Furnace Slag Limit: 50% by weight of total cementitious materials.
    b. In mass concrete more than 2 feet thick, the usage rate may be 80% by weight of total cementitious materials.

3. Silica Fume: ASTM C1240, amorphous silica.

    a. Silica Fume Limit: 10% by weight of total cementitious materials.

4. Combined Fly Ash and Ground Granulated Blast-Furnace Slag:

    a. Supplementary Cementitious Materials Limit: 50% with fly ash not exceeding 25% by weight of total cementitious materials.
    b. In mass concrete more than 2 feet thick: 80% with fly ash not exceeding 50% by weight of total cementitious materials.

5. Combined Fly Ash and Silica Fume:

    a. Supplementary Cementitious Materials Limit: 35% with fly ash not exceeding 25% and silica fume not exceeding 10% by weight of total cementitious materials.

6. Combined Fly Ash, Ground Granulated Blast-Furnace Slag, and Silica Fume:

    a. Supplementary Cementitious Materials Limit: 50% with fly ash not exceeding 25% and silica fume not exceeding 10% by weight of total cementitious materials.

C. Coarse Aggregate for Normal Weight Concrete: Comply with ASTM C33. Provide coarse aggregate from a single source for exposed concrete. Gradations shall be similar to that described in the following table:

COARSE AGGREGATE GRADATIONS							
SIEVE SIZE - PERCENT PASSING							
Grade No.	1-1/2"	1"	3/4"	1/2"	3/8"	No. 4	No. 16
4	90-100 Note 1	20-55	0-15	---	0-5	---	---
57	100	95-100	---	25-60	0-10	0-10	---
67	---	100	90-100	---	20-55	0-10	---

89	---	---	---	100	90-100	20-55	0-10

1. Shall be 100 percent passing the 2" sieve.
2. A maximum of 30% of coarse aggregate may be recycled aggregate for footing and grade beam concrete.

D. Fine Aggregate for Normal Weight Concrete: Comply with ASTM C33. Provide fine aggregate from a single source for exposed concrete. Fine aggregate shall consist of washed sand. Gradations shall be similar to that described in the following table:

FINE AGGREGATE GRADATIONS							
SIEVE SIZE - PERCENT PASSING							
Grade No.	3/8	No. 4	No. 8	No. 16	No. 50	No. 80	No. 100
FA	100	95-100	80-100	50-85	5-30	---	0-10

1. A maximum of 10% of fine aggregate may be recycled aggregate for footing and grade beam concrete.

E. Do not use aggregates containing deleterious substances that could cause spalling on any exterior exposed surface. These include, but are not limited to the following:

1. Organic impurities.
2. Ferrous metals.
3. Soluble salts.
4. Coal, lignite, or other lightweight materials.
5. Soft particles.
6. Clay lumps and friable particles.
7. Cherts of less than 2.40 specific gravity.

F. Water: Mixing water for concrete shall meet the requirements of ASTM C94. Water shall be clean and free from injurious amounts of acids, alkalis, organic materials, chloride ions and oils deleterious to concrete or reinforcing steel.

G. Testing agency shall be given access to plants and stockpiles to obtain samples for testing for compliance with the Contract Documents.

2.02 ADMIXTURES

A. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures. Calcium chloride thiocyanates or admixtures containing intentionally added chlorides are not permitted.

B. Water Reducing Admixture: Material shall comply with ASTM C494, Type A.

1. Acceptable:

a. Master Builders Solutions - MasterPozzolith Series or MasterPolyheed Series.
b. Chemical Company - Eucon WR Series.
c. Sika Chemical Corp. - Plastocrete 161.

d. GRT - Polychem 400 NC.
e. Grace Construction Products - WRDA 82.

C. High Range Water Reducing Admixture (superplasticizer): Material shall comply with ASTM C494, Type F or Type G.

1. Acceptable:

a. Master Builders Solutions - MasterRheobuild 1000 or MasterGlenium Series.
b. Euclid Chemical Company - Eucon 37 or Plastol Series.
c. Sika - ViscoCrete 2100.
d. GRT - Melchem.
e. Grace Construction Products - Mira 110.

D. High Range Water Reducing, Slump Retaining Admixture: Material shall comply with ASTM C494, Type F or Type G.

1. Acceptable:

a. Master Builders Solutions - MasterGlenium 7700.
b. Euclid Chemical Company - Eucon 537, Eucon 1037, or Plastol Series.
c. Sika - Sikament 686.
d. GRT - Melchem - M.
e. Grace Construction Products - ADVA FLEX.

E. Non-Chloride Accelerator: Material shall comply with ASTM C494, Type C or Type E, and not contain a higher chloride ion concentration than municipal drinking water.

1. Acceptable:

a. Master Builders Solutions - MasterSet FP 20 or MasterSet AC 534.
b. Euclid Chemical Company - Accelguard Series.
c. Sika Chemical Corp. - Sika Rapid-1.
d. GRT - Polychem HE.
e. Grace Construction Products - Lubricon NCA.

F. Air Entraining Admixture: Air entraining admixture shall comply with ASTM C260, and be certified by the manufacturer to be compatible with other admixtures to be used.

1. Acceptable:

a. Master Builders Solutions - MasterAir Series.
b. Euclid Chemical Company - Air-Mix or AEA Series.
c. Sika Chemical Corporation - Sika-Aer.
d. GRT - Polychem VR.
e. Grace Construction Products - Darex II or Daravair 1000.

G. Shrinkage Reducing and/or Shrinkage Compensating Admixture: Admixture used for the compensation and reduction of shrinkage in Portland cement concrete.

1. Acceptable:

a. Euclid Chemical Company - Conex.
b. Grace Construction Products - Eclipse Floor 200.
c. Master Builders Solutions - MasterLife SRA Series or MasterLife CRA 007

H. Workability-Retaining Admixture: Admixture shall retain concrete workability without affecting time of setting or early-age strength development, while meeting the requirements of ASTM C494 as a Type S admixture.

1. Acceptable:

a. Master Builders Solutions œœ MasterSure Z 60

I. Permeability-Reducing Admixture: Admixture is Portland cement-based crystalline capillary waterproofing material that reacts to form insoluble crystalline hydration products in the capillary pores of concrete. When tested in accordance with CRD-C 48 at a pressure of 200 psi, a reduction is shown when compared to an identical mixture without the admixture. Testing in accordance with DIN 1048 for a duration of 96 hours shows a reduction or no water penetration when compared to an identical mixture without the admixture. NSF-61 certified.

1. Acceptable:

a. Master Builders Solutions œœ MasterLife 300 Series

J. Admixtures used in concrete shall be the same brand, type, and dosage used in concrete represented by field test data or used in trial mixes.

2.03 CURING PRODUCTS

A. Moisture Retaining Cover

1. Plastic Film: Use 6 mil polyethylene film sheet materials that meet the requirements of ASTM C171.
2. White burlap-polyethylene sheet meeting ASTM C171.
3. Reinforced curing paper complying with ASTM C171.
4. Moisture Retaining Fabric: A naturally colored, non-woven, polypropylene fabric with a 4-mil, non-perforated reflective (white) polyethylene coating containing stabilizers to resist degradation from ultraviolet light. Fabric shall exhibit low permeability and high moisture retention. Acceptable manufacturers and products include:

a. PNA Construction Technologies, Inc.: Hydracure S16.
b. PNA Construction Technologies, Inc.: Hydracure M5.
c. Reef Industries Incorporated: Transguard 4000.

B. Dissipating Resin Curing Compound: Clear, waterborne, membrane-forming curing compound complying with ASTM C309, Type 1, Class B shall be composed of hydrocarbon resins and dissipating agents that begin to break down upon exposure to ultraviolet light and traffic approximately 4 to 6 weeks after application, providing a film that is removable with standard degreasing agents and mechanized scrubbing actions so as to not impair the later addition of applied finishes.

1. Curing compounds used on interior enclosed environments shall be a water-borne product and VOC compliant as required by the U.S. EPA Architectural Coating Rule.

C. Non-dissipating Curing Compound: Clear, membrane-forming curing compound complying with ASTM C309, Type 1, Class B.

1. Curing compounds used on interior enclosed environments shall be a water-borne product and VOC compliant as required by the U.S. EPA Architectural Coating Rule.

D. Curing and Sealing Compound: Clear, membrane-forming curing and sealing compound complying with ASTM C309, Type 1, and ASTM C1315, Type 1, Class A. Compound shall dry to a clear finish, resist yellowing due to ultraviolet degradation and provide a long-lasting finish that has high resistance to chemicals, oil, grease, deicing salts, and abrasion.

1. Curing and sealing compounds used on interior enclosed environments shall be a water-borne product and VOC compliant as required by the U.S. EPA Architectural Coating Rule.

2.04 MISCELLANEOUS MATERIALS

A. Patching Mortar: Non-shrink, non-slump, non-metallic, quick setting.

1. Acceptable manufacturers and products:

a. Euclid Chemical Company - Eucospeed.
b. Master Builders Solutions - MasterEmaco N 424.
c. Adhesive Technologies. - Hard Rok Vertipatch.
d. W.R. Meadows - Speed Crete (Red Line).
e. Dayton Superior - Re-Crete 20 minute.
f. SpecChem - Precast Patch.

B. Cement Grout: Mix 1 part Portland limestone cement, 2-1/2 to 3 parts fine aggregate, and enough water for required consistency. Depending on use, consistency may range from mortar consistency to a mixture that will flow under its own weight. Do not mix more than the amount that can be used within 30 minutes. Retempering is not permitted. Use for leveling, preparing setting pads, beds, construction joints (with liquid bonding admixture) and similar uses. Do not use for grouting under bearing plates or structural members in place.

C. Dry-Pack: Mix 1 part Portland limestone cement, 2 parts fine aggregate, and enough water to hydrate cement and provide a mixture that can be molded with the hands into a stable ball (a stiff mix). Do not mix more than the amount that can be used within 30 minutes.

D. Expansion Joint Material: Preformed, resilient, non-extruding asphalt-impregnated fiber conforming to ASTM D1751. Thickness of expansion joint material shall be 1/2" unless noted otherwise on the drawings.

E. Magnesium phosphate patching cement specially designed for cold weather grouting and anchoring.

1. Acceptable:

a. Master Builders Solutions - MasterEmaco T545.
b. Euclid Chemical Company - Eucospeed MP.

F. Vapor Barrier: ASTM E 1745, Class A, not less than 15 mils thick.

1. Acceptable:

a. Stego Industries, LLC - Stego Wrap.
b. W.R. Meadows, Inc. - Perminator.
c. Raven Industries - Vapor Block.
d. Insulation Solutions - Viper VaporCheck II.

G. Bonding Agent: "Weld-Crete" manufactured by the Larsen Products Corporation or "Nitobond Acrylic" manufactured by Fosroc Inc. or approved equivalent.

H. Anti-Bonding Agent: "Thompson's Water Seal" as manufactured by A. E. Thompson, Inc., California or approved equivalent.

I. Epoxy-Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class and grade to suit requirements, and as follows:

1. Type II, non-load bearing, for bonding freshly mixed concrete to hardened concrete.
2. Types I and II, non-load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
3. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

J. Control Joint Filler: Flexible, single-component polyurethane sealant with backer rod compliant with ASTM C 920, Type S, Grade P, Class 25. Apply sealant per manufacturers written recommendations.

1. Acceptable:

a. Dayton Superior - Perma 230 SL.
b. Euclid Chemical Company - Eucolastic I.
c. Master Builders Solutions - MasterSeal SL 1.

2.05 STRENGTH AND PROPERTIES

A. Concrete Mix Designs: Refer to the drawings for specified compressive strength and other performance criteria. Proportion concrete mixes to meet design and performance requirements. The concrete supplier may produce a mix at a lower water-cement ratio to allow for adjustment of slump at the site by adding water. The addition of site water shall be in accordance with ASTM C94.

B. Slump of Superplasticized Concrete: Concrete containing high-range water reducing admixtures (superplasticizer) shall have 8" maximum slump, unless otherwise approved by Structural Engineer.

C. Compliance with Fire Assembly: All concrete supplied for slab on metal decks shall meet the requirements for a 2-hour floor construction per UL assembly number D925. Specifically, the concrete must meet the following:

1. Be normal weight with fresh bulk density of 107-116 pcf.
2. Be vibrated during placement.

D. Accelerators: Add non-chloride accelerator to all concrete slabs placed at air temperatures below 50F only when approved in the mix design. Use of admixtures will not relax cold weather placement requirements.

E. Water Reducer: Add water reducing admixture or high range water reducing admixtures (superplasticizers) as follows:

1. All pumped concrete.
2. Fiber reinforced concrete.
3. As required for placement or workability.
4. As required by high temperatures, low humidity, or other adverse placement conditions.

5. Concrete with water-cementitious materials ratio below 0.50.

F. No other admixtures shall be used unless approved by Structural Engineer.

G. Chlorides: Admixtures or other ingredients including aggregates containing calcium chloride or more than 0.05% chloride ions by weight shall not be used.

H. Workability: Concrete shall have a workability such that it will fill the forms without voids, honeycombs, or rock pockets with proper vibration without permitting materials to separate or excess water to collect on the surface.

I. Concrete Temperatures: Minimum concrete temperature of fresh concrete varies in relation to average air temperature over a 24-hour period as follows:

1. Air temperature below 0F Concrete temperature 70F min.
2. Air temperature 0F to 30F Concrete temperature 65F min.
3. Air temperature 30F to 50F Concrete temperature 50F min.
4. Air temperature above 50F No minimum temperature
5. The maximum temperature of concrete at the time of delivery shall be 95F. When concrete temperature exceeds 95F, concrete supplier shall attempt to reduce temperature by shading aggregates and cement and cooling mix water. When these methods fail to reduce the concrete temperature below 95F, supplier shall use ice in the water to reduce the concrete temperature. Use set retarding admixtures only when approved in the mix design.

PART 3 - EXECUTION

3.01 PREPARATION

A. Verify requirements for concrete cover over reinforcement.

B. Verify anchors, seats, plates, reinforcement, and other items to be cast into concrete are accurately placed, positioned securely, and will not cause hardship in placing concrete.

C. Do not place concrete until data on materials and mix designs have been approved, Architect has been notified, and all other affected trades have coordinated their work.

D. Remove snow, ice, frost, water, mud, and other foreign material from surfaces, reinforcing bars and embedded items against which concrete will be placed.

E. Prepare previously placed concrete by cleaning with sandblasting, steel brush, or water blast to expose aggregate to minimum 1/4" amplitude.

F. Sandblast all existing concrete surfaces older than 28 days against which concrete is to be placed, unless directed otherwise in writing by Architect/Engineer.

3.02 SLABS

A. Slab on Grade:

1. All interior slabs on grade shall have a polyethylene vapor retarder conforming to ASTM E1745. Lap all joints minimum 6" and seal edges with adhesive tape. Fit vapor retarder around utilities and seal with adhesive tape as required. Place, protect, and repair vapor-retarder sheets according to ASTM E 1643 and manufacturer's written instructions.

2. Refer to drawings and Section 31 23 00 for required sub-grade preparation beneath slabs on grade.
3. Where vapor retarder is not used below the slab on grade, wet sub-grade below slab prior to placing concrete. Subgrade shall be moist with no free water and no muddy or soft spots.
4. Saw cut control joints: Cut with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks. Control joints shall be located along column lines, with intermediate joints spaced at a maximum distance indicated on the drawings, unless noted otherwise. Control joints shall be continuous, not staggered or offset. Slab panels shall have a maximum length to width ratio of 1.5 to 1. Provide additional control joints at all reentrant or isolated corners formed in the slab on grade. Refer to the drawings for typical control joint detailing.
5. Depress slabs as required for mats, architectural finishes, pits, and kitchen equipment. Obtain layout and locations from Architect.
6. Verify completion of all under slab work with mechanical and electrical trades before placing slabs.
7. Slope slabs as indicated on the drawings and to provide positive drainage. Slope slab keeping bottom level and varying top. Maintain minimum thickness of concrete as indicated on the drawings. Refer to floor finishes for tolerances.

B. All supported slabs, including slabs-on-steel decking and cast-in-place concrete slabs:

1. Supported slabs have deflections that may cause areas of concrete to have thicknesses greater than indicated on the drawings. Contractor is expected to provide that volume as needed to finish the floor at the specified elevation. If specified floor finish tolerances are not achieved during the concrete floor construction, after formwork removal, the Contractor shall install, at no cost to the project, a self-leveling cementitious underlayment Master Builders Solutions - MasterTop 110 SL or approved equivalent to correct the floor flatness and levelness.

C. Embedded Items:

1. The outside diameter of embedded conduit or pipe shall not exceed one-third of the slab thickness in structural slabs, including at crossovers, and shall be placed between the top and bottom reinforcing with a minimum 3" clear cover. Conduit or pipe running parallel to each other shall be spaced at least 8" apart and no more than 2 runs stacked vertically in the slab. Conduit or pipe shall not be embedded in any supported slab less than 6" thick. No embedded conduit or pipe is allowed in any concrete slab-on-steel deck.

3.03 CONSTRUCTION JOINTS

A. Slabs: Where slab pour is to receive a subsequent topping or additional concrete, expose aggregate in top surface by brooming in two directions at right angles to each other.

B. Vertical: Locate vertical construction joints in walls not farther than a maximum of 100 feet on center. Coordinate joint locations with architectural design.

C. Horizontal: Locate horizontal joints in walls, piers, at underside of slabs, and at the top of slabs and footings unless otherwise indicated. At least 24 hours shall elapse between placing concrete in a wall, and placing concrete in an area supported by the walls,, unless approved in writing by the Structural Engineer.

D. Reinforcing: Stop all welded wire reinforcement and/or reinforcing at construction joints in slabs on grade and provide dowel bars as detailed. Provide reinforcement at other construction joints as detailed. Roughen and thoroughly clean the surface of the concrete, remove all laitance, and wet the surface before placing new concrete against the joint. Roughen entire surface at construction joints to remove surface paste and expose aggregate.

E. Wall Control Joints: Locate vertical control joints in exposed walls at a minimum uniform spacing not to exceed 25'-0". Coordinate joint locations with architectural drawings.

F. Exposed Surfaces: Locate construction joints only at predetermined locations approved by the Architect and the Structural Engineer.

3.04 CONCRETE PLACEMENT

A. Place concrete as continuously as possible until placement is complete. Do not place against concrete that has attained initial set, except at authorized joints. If, for any reason, concrete pour is delayed for more than 45 minutes, bulkhead off pour at last acceptable construction joint. Immediately remove excess concrete and clean forms.

B. Do not begin to place concrete during periods of rain, sleet, or snow unless adequate protection is provided.

C. No concrete shall be cast onto or against sub-grades containing free water, frost, ice, or snow. If earth at bottom of forms has dried out, rewet so the soil is moist, but free of standing water and mud.

D. Notify the Architect in advance if concrete is to be pumped.

E. Do not place concrete until all reinforcement is in place, forms have been thoroughly cleaned and approval has been given.

F. Do not accept concrete delivered to the job site more than 90 minutes after initial mixing.

G. Concrete from its point of release to mixers, hoppers, or conveyances, shall not be permitted to drop more than 5 feet (10 feet for concrete containing high-range water reducers). Deposit concrete directly into conveyances and directly from conveyances to final points of deposit. Sufficient transportation equipment in good working order shall be on hand before work begins. All conveying equipment must be clean and kept clean during concreting operations. Take every possible precaution to prevent segregation or loss of ingredients.

H. Regulate rate of placement so concrete surface is kept level throughout; a minimum being permitted to flow from one area to another. Use tremie heads spaced at approximately 10-foot intervals for placing concrete in walls. Control rate of placement consistent with form design.

I. Deposit concrete in one continuous operation until section being placed has been completed. For slab thicknesses greater than 12 inches, prevent excessive segregation of aggregate and high temperatures in accordance with ACI 304 and ACI 308. Place concrete in wall forms in layers not greater than 12 inches in depth, each layer being compacted by internal vibration before succeeding layer is placed.

J. Place concrete as near as possible to its final position to prevent segregation or loss of materials. Do not use vibrators to transport concrete within forms. Consolidate concrete in walls, columns, beams, and slabs or joist construction thicker than 8" with internal vibrators (8,000 to 12,000 VPM). Slabs less than 8" thick may be consolidated with internal vibrators (9,000 to 13,500 VPM) or vibrating screeds supported on forms, boards, or rails, approved by the Structural Engineer, supplement vibration by forking or spading by hand along surfaces adjacent to forms and construction joints. Be sure an adequate number of operating vibrator units are on hand to properly consolidate quantity of concrete to be placed, including spares for emergency use.

1. Vertically insert and remove handheld vibrators at constant intervals 18 to 30 inches apart. Vibrate concrete the maximum amount and time required for complete consolidation, without segregation, and release of entrapped air bubbles, but in no instance exceed 15 seconds per square foot of exposed surface.

K. Re-tempering of concrete shall not be permitted. Concrete that has stood more than 15 minutes after leaving the mixer shall be discarded.

L. Exercise care in placing concrete over waterproof membranes, rigid insulation, and/or protection boards to avoid damaging those materials. Report damage immediately, and do not proceed until damage is repaired.

M. Remove loose debris from hardened surfaces of previous pours by sandblasting surfaces and expose clean coarse aggregate firmly embedded in cement matrix.

N. Protect existing concrete work to be exposed to view and other finished materials from damage and staining resulting from concreting operations. Handle concrete carefully to avoid dripping and spillage. Remove spilled concrete from existing surfaces immediately. Covering sills, ledges, and other surfaces with protective coverings may be necessary to protect the work.

O. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete Work.

P. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on drawings. Set anchor rods for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

Q. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on the drawings. Screed, tamp, and trowel-finish concrete surfaces.

3.05 CONCRETE FINISHES AND TOLERANCES

A. Exposed Smooth Formed Surfaces: Remove forms and perform necessary repairs and patch to produce surface finish-3.0 as specified in ACI 301. Apply the following to smooth-formed finished concrete exposed to view in the finished work. Confirm finishes with the Architect prior to concrete placement by submitting shop drawings indicating locations of all types of finishes.

1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part Ordinary Portland cementPortland limestone cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white Ordinary Portland cementPortland limestone cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix one part Ordinary Portland cementPortland limestone cement and one part fine sand with a 1:1 mixture of bonding agent and water. Add white Ordinary Portland cementPortland limestone cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.

B. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.06 CONCRETE SLAB FINISHES AND TOLERANCES

A. Trowel Finish:

1. Screed concrete to an even plane, float, then power trowel the surface.
2. Hand trowel the surface smooth and free of trowel marks. Continue hand troweling until a ringing sound is produced as the floor is troweled.
3. Provide trowel finish as indicated on the drawings and at the following locations:

    a. Concrete floors exposed in finished work unless otherwise indicated.
    b. Slabs to receive curing compounds and sealers.
    c. Slabs to receive resilient flooring or carpet.
    d. .

B. Fine Broom Finish:

1. Screed concrete to an even plane, float, then power trowel the surface. Provide fine hair broom finish perpendicular to slope, free of loose particles, ridges, projections, voids, and concrete droppings.
2. Provide fine broom finish as indicated on the drawings and at the following locations:

    a. Stoop slabs.
    b. Raised curbs and walkway areas.
    c. Slabs to receive thin set ceramic tile.
    d. .

C. Broom Finish:

1. Screed concrete to an even plane and then float. Immediately after concrete has received a floated finish, give the concrete surface a coarse transverse scored texture by drawing a coarse broom across the surface.
2. Provide as indicated on the drawings and at the following locations:

    a. ADA ramp slabs.
    b. Exterior walkway slabs.
    c. .

D. Float Finish:

1. Screed concrete to an even plane then float.
2. Provide as indicated on the drawings and at the following locations:

    a. Slabs to directly receive concrete topping.
    b. Roof slabs to receive loose laid roof insulation.
    c. .

E. Floor Finish Tolerances: Floor finish tolerances shall be measured by placing a freestanding (unleveled) 10-foot straightedge anywhere on the slab and allowing it to rest upon two high spots within 72 hours after placement of slab and removal of shoring (if present). The gap at any point between the straightedge and the floor (and between the high spots) shall not exceed:

1. Slab on Grade (Office, School): 1/4"
2. Slab on Grade (General Warehouse): 3/16"
3. Suspended Slabs (Steel frame): 1/4"

F. Slab Drainage: Finish all concrete slabs to proper elevations to ensure that all surface moisture will drain freely to floor drains, and that no puddle areas exist. Contractor shall bear the cost of corrections to provide positive drainage.

G. Special Tolerances for Concrete Slabs: No abrupt change in vertical elevation of 1/4" or more is acceptable at the interface between slabs and within areas where pedestrian traffic is expected.

3.07 CONCRETE CURING

A. Freshly placed concrete shall be protected from premature drying and excessively hot temperatures.

B. Concrete other than high-early strength shall be maintained above 50F and in a moist condition for at least the first 7 days after placement, except when special curing is used. Special curing procedures shall not be used without written permission from the Structural Engineer.

C. Formed surfaces shall be cured by leaving the formwork in place during the curing period.

D. Protect concrete from excessive changes in temperature during the curing period and at the termination of the curing process. Changes in the temperature of the concrete shall be as uniform as possible and shall not exceed 5F in any one hour or 50F in any 24-hour period.

E. Protect concrete from injury from the elements until full strength is developed. Protect from mechanical injury.

F. During cold weather construction, all footings shall be protected from frost penetration until the building is enclosed and temporary heat is provided.

3.08 SLAB CURING

A. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface. Use one of the methods described below.

B. Moisture-Retaining-Cover Curing for Concrete Floors Not Exposed in Final Condition: Cover concrete surface with waterproof sheet material as soon as finishing operations are complete and the concrete is sufficiently hard to be undamaged by covering. The cover shall be placed flat on the concrete surface, avoiding wrinkles. Sprinkle concrete with water as necessary during application of covering. Place in widest practicable width, with sides and ends lapped at least 12 inches, and seal with waterproof tape or adhesive. Verify the concrete is continuously wet under the sheets; otherwise, add water through soaker hoses under the sheets. Weight down covering to prevent displacement. Immediately repair any holes or tears during the curing period using polyethylene sheet and waterproof tape. Curing process shall be maintained for a minimum of 7 days.

C. Moisture-Retaining-Fabric Curing for Concrete Floors to Remain Exposed: Cover concrete surface with moisture retaining fabric as soon as finishing operations are complete and the concrete is sufficiently hard to be undamaged by covering. The cover shall be installed in accordance with the manufacturer's written recommendations, in largest practical widths. Wet the slab to rejection, then thoroughly wet fabric side of cover and install with poly side up. Lap over adjacent covers a minimum of 18". Wet all laps and outside edges to prevent displacement and to ensure intimate contact with concrete and adjacent covers. Rewet as necessary and protect covers from damage during curing process.

1. After minimum 7-day cure, remove moisture retaining fabric in sections.
2. A maximum of 3,500 square feet of concrete curing cover may be removed at any one time. At no time shall the exposed area be permitted to dry prior to completion of the floor scrubbing process.
3. Using a high-powered floor scrubber capable of a minimum 80 pounds head pressure, and a mild citrus-based detergent that does not damage or mar the surface in any way, scrub the floor to remove any minerals or soluble salts that may have accumulated at the floor surface. Rinse area thoroughly with clean fresh water. Remove water and allow floor to dry. If whitening occurs during drying, repeat scrubbing process before floor dries until no whitening occurs during drying.
4. All areas of the floor shall remain wet during floor scrubbing process. Expose only the amount of floor surface that can be cleaned before any drying occurs without exceeding the maximum allowable exposed area.

D. Curing Compound: Apply uniformly in continuous operation by low pressure spray equipment or roller as soon as finishing operations are complete, free water on the surface has disappeared, and no water sheen can be seen. Follow the manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period. Verify compatibility of the curing compound with paint, finishes, or toppings that require positive bond to the concrete. If curing compound is not compatible with paint finishes or toppings, utilize a dissipating curing compound and remove in accordance with the manufacturer's recommendations.

3.09 PENETRATING LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.

B. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs in accordance with manufacturer's written instructions.

C. Do not apply to concrete that is less than seven days old.

D. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second coat in a similar manner if surface is rough or porous.

3.10 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

B. Do not fill joints until construction traffic has permanently ceased.

C. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

D. Install semi-rigid joint filler in saw-cut joints and in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.11 APPLICATION OF FLOOR SEALER - FINISH COAT

A. Give concrete floors, as indicated in the Room Finish Schedule and where exposed in finished Work, a second coat of curing and sealing compound immediately prior to Substantial Completion.

B. Clean floors and apply sealer strictly according to manufacturer's instructions. Dilution and coverage shall be as recommended by the manufacturer. Apply sealer evenly.

3.12 COLD WEATHER CONCRETING

A. Definition: Cold weather shall be defined as a period when for more than three successive days the average daily outdoor temperature drops below 40F. The average daily temperature is the average of the highest and lowest temperature during the period from midnight to midnight. When temperatures above 50F occur during more than half of any 24-hour duration, the period shall not be regarded as cold weather.

B. All cast-in-place concrete work occurring during cold weather shall conform to all requirements of ACI 306.1, "Standard Specification for Cold Weather Concreting", published by the American Concrete Institute, Detroit, Michigan, except as modified by the contract documents or this specification.

C. Planning: The General Contractor, concrete contractor, concrete supplier, and Architect shall have a pre-construction conference to outline the cold weather concreting operations concerning the placing, finishing, curing and protection of the concrete during cold weather. Pre-construction conference shall occur before cold weather is expected to occur.

D. Detailed procedure submittal: Concrete contractor shall prepare and submit for review detailed procedures for the production, transportation placement, protection, curing and temperature monitoring of concrete during cold weather. Include procedures to be implemented upon abrupt changes in weather conditions. Do not begin cold weather concreting until these procedures have been reviewed and approved.

E. Mixing: Concrete flatwork poured in cold weather shall be proportioned to obtain a lower slump to minimize the amount of bleed water during finishing. All bleed water should be skimmed off flatwork prior to troweling. Concrete that will be exposed to cycles of freezing and thawing while saturated should be properly air entrained as outlined in this specification.

F. Protection of Concrete: Cure and protect concrete against damage from freezing for a minimum period of 72 hours, unless approved by the Structural Engineer. The protection period may be reduced according to ACI 306.1 requirements. Concrete contractor shall submit a letter of request to reduce the protection period, by outlining the method used to achieve the reduction per ACI 306.1.

1. When practical for the construction schedule, formwork shall be insulated and remain in place for at least the required protection period.

G. Concrete Temperatures: The minimum temperature of concrete immediately after placement shall be as specified in the following table.

			Mixing Temperatures		
Section Size	Minimum temperature of concrete as placed and maintained during the protection period	Maximum gradual decrease in surface temperature during any 24 hours after the end of the protection.	Above 30F	0 to 30F	Below 0F
Less than 12 in	55F	50F	60F	65F	70F
12-36 in	50F	40F	55F	60F	65F
36-72 in	50F	30F	50F	55F	60F
Greater than 72 in	50F	20F	45F	50F	55F

H. Mixing Temperatures: As the ambient air temperature decreases, the concrete mixing temperature shall be increased to compensate for the heat lost in the period between mixing and placement. The concrete supplier shall use one or both of the following methods for increasing the concrete temperature.

1. Heating the mixing water to a temperature necessary to offset the temperature losses during transport. Supplier shall not heat water to temperatures in excess of 140F, without taking special precautions as outlined in ACI 306.
2. Heating the aggregate with a circulated steam piping system.

I. Temperature Measurements: The Contractor shall be responsible for monitoring and recording the concrete temperatures during placement and throughout the protection period.

1. Inspection personnel shall keep a record of the date, time, outside air temperature, temperature of concrete as placed, and weather conditions.
2. Temperature of the concrete and the outside air shall be recorded at regular intervals but not less than twice in a 24-hour period. The record shall include temperatures at several points within the enclosure and on the concrete surface of sufficient frequency to determine a range of temperatures.
3. Inspection agency shall submit the temperature logs to the Architect for permanent job records.

3.13 HOT WEATHER PROTECTION

A. Definition: Hot weather shall be defined as any combination of high ambient temperature, low relative humidity, high winds, and intense solar radiation that leads to higher than usual evaporation. The table below defines low relative humidity based on air temperature. For a given air temperature, if the relative humidity is equal to or less than the specified minimum, provisions for hot weather concreting shall be as follows:

Air Temperature	Minimum Relative Humidity
105F	90%
100F	80%
95F	70%
90F	60%
85F	50%
80F	40%
75F	30%

B. Scheduling: When hot weather is expected, adjust concrete placement schedules to avoid placing or finishing during the period from noon until 3:00 pm. When possible, slab pours should be delayed until the building is enclosed to protect the concrete from wind and direct sunlight. The construction schedule shall account for 7-day moist curing period.

C. Mixing: Concrete supplier shall adjust mix designs and admixtures to minimize slump loss. Concrete shall be mixed at a water-cement ratio, which is lower than the specified maximum, to allow for the adjustment of slump by addition of water in the field. Water reduction shall be accomplished without reducing initial slump by increasing dosage of a water reducing admixture.

D. Preparation: Do not order concrete earlier than is required to avoid delays. Cool forms, subgrades and reinforcing bars with water spray from fog nozzle prior to concrete placement.

E. Delivery: Site traffic shall be coordinated, and delivery times scheduled to minimize waiting times for concrete trucks.

F. Placement: Preparations shall be made to place and consolidate the concrete at the fastest possible rate. Maintain a continuous flow of concrete to the job site to avoid development of cold joints, during placement of slabs, apply fog spray to prevent moisture loss without causing surplus water to stand on concrete surface.

G. Finishing: Finish concrete as fast as practical. Continue fogging concrete during finishing. Where fogging is not possible, apply sprayable moisture-retaining film between finishing passes.

H. Curing: Formed concrete shall be covered with a waterproof material to retain moisture. Flat work shall be moisture cured as described in this specification. Moist curing shall continue for at least 7 days.

3.14 FIELD QUALITY ASSURANCE

A. Independent Testing Agency and Special Inspector shall each perform their prescribed inspection, sampling, and testing services as described in Part 1 of this specification section.

B. In cases where samples have not been taken or tests conducted as specified or strength of laboratory test cylinders for a particular portion of the structure fails to meet requirements of ACI 301, for evaluation of concrete strength, Structural Engineer shall have the right to order compressive or flexural test specimens or both be taken from the hardened concrete according to ASTM C42, load tests according to ACI 318, or such other tests as may be necessary to clearly establish the strength of the in situ concrete, and such tests shall be paid for by the Contractor. Where cores have been cut from the Work, Contractor shall fill voids with dry-pack and patch the finish to match the adjacent existing surfaces.

3.15 REPAIR OF DEFECTIVE AREAS

A. All repair of defective areas shall be made, with prior approval of Architect and Structural Engineer as to method and procedure, in accordance with Section 5 of ACI 301, except specified bonding compound must be used. Cosmetic repairs of minor defects in exposed concrete surfaces shall be in a manner acceptable to the Architect. Defective areas shall be deemed when:

1. Tests on core or prism specimens fail to show specified strengths.
2. Not formed as indicated or detailed.
3. Not plumb or level where so indicated or required to receive subsequent work.
4. Not true to intended grades and levels.
5. Cut, filled, or resurfaced, unless under direction of the Structural Engineer.
6. Debris is embedded therein.
7. Not fully in conformance with provisions of the drawings.
8. Damaged by hot or cold weather conditions.
9. Mixing time exceeds 90 minutes from ready-mix plant to the time of deposit.

B. Patch form tie holes at the following locations:

1. Unfinished exposed concrete (not scheduled for painting, plus at board formed concrete finish).
2. All other areas: Prime voids with bonding compound and fill with patching mortar. Strike flush without overlap, float to uniform texture to match adjacent surfaces.
3. Exposed areas scheduled for spray texture:

    a. Remove projections and protrusions: 1/16" or larger.
    b. Remove continuous ridges 1/32" or larger.
    c. Fill voids and pin holes.

4. Exposed areas scheduled for paint or epoxy:

    a. Remove projections, ridges, and other protrusions 1/32" or larger.
    b. Fill voids and pin holes 1/16" or larger.

5. Exposed areas not scheduled for paint or other finishes:

    a. Remove projections, ridges and other protrusions not conforming to requirements specified under Section 03 10 00.
    b. Fill voids and pin holes not conforming to requirements specified under Section 03 10 00.

C. All structural repairs shall be made, with prior approval of the Architect/Engineer, as to method and procedure, using the specified epoxy adhesive and/or epoxy mortar.

D. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension in solid concrete but not less than 1 inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
2. Repair defects on surfaces exposed to view by blending white Ordinary Portland cementPortland limestone cement and standard Ordinary Portland cementPortland limestone cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.

E. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. After concrete has cured at least 14 days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mix as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

3.16 CEMENT GROUT AND DRY-PACK

A. Cement Grout: Thoroughly mix sufficient quantities to avoid combining different batches of grout mix. Ensure that grout completely fills all spaces and voids. Level, screed, or cut flush excess grout to produce smooth, neat, even exposed surfaces.

B. Dry-Pack: Thoroughly blend dry ingredients prior to mixing with water. Forcibly pack mixture to completely fill voids and spaces.

3.17 CLEANING

A. Clean exposed concrete to remove laitance, efflorescence and stains.

END OF SECTION 03 30 00

SECTION 03 41 00
STRUCTURAL PRECAST CONCRETE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Engineering, fabrication, and erection of structural precast concrete units. Work shall include, but not be limited to, the following items:

1. Beams
2. Spandrels
3. Columns
4. Bearing Saddles
5. Double Tee Deck Sections
6. Precast Hollow Core Slab Sections
7. Load Bearing Wall Panels

B. Work shall also include headers for openings, connections, anchor bolts, templates, installation instructions, and grouting of precast units. Anchor bolts shall be installed by others.

C. Structural notes indicated on the drawings regarding structural precast concrete shall be considered a part of this specification.

1.02 RELATED WORK

A. Pertinent Sections of Division 01.

B. Section 03 20 00 - Concrete Reinforcement.

C. Section 03 30 00 - Cast-in-Place Concrete.

D. Section 04 22 00 - Reinforced Unit Masonry.

E. Section 05 12 23 - Structural Steel.

F. Section 05 21 00 - Steel Joists.

G. Section 05 31 00 - Steel Deck.

1.03 REFERENCES

A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified. Where any provisions of other pertinent codes and standards conflict with this specification, the more stringent provision shall govern.

1. ACI 301 - Specifications for Structural Concrete.
2. ACI 318 - Building Code Requirements for Structural Concrete.
3. ASTM A36 - Standard Specification for Carbon Structural Steel.

4. ASTM A416 - Standard Specification for Low-Relaxation, Seven-Wire Steel Strand for Prestressed Concrete.
5. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
6. ASTM A1064 - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
7. ASTM C33 - Standard Specification for Concrete Aggregates.
8. ASTM C150 - Standard Specification for Portland Cement.
9. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
10. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.
11. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
12. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
13. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.
14. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
15. ASTM F3125 - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi and 150 ksi Minimum Tensile Strength, Inch Dimensions.
16. AWS D1.1 - Structural Welding Code - Steel.
17. AWS D1.4 - Structural Welding Code - Reinforcing Steel.
18. Concrete Reinforcing Steel Institute (CRSI) - Manual of Standard Practice.
19. PCI MNL-116 - Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products.
20. PCI MNL-117 - Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products.
21. PCI MNL-120 - PCI Design Handbook - Precast and Prestressed Concrete.
22. PCI MNL-123 - Connections Manual - Design and Typical Details of Connections for Precast and Prestressed Concrete.
23. PCI MNL-124 - Design for Fire Resistance of Precast/Prestressed Concrete.
24. PCI MNL-126 - PCI Manual for the Design of Hollow Core Slabs and Walls.
25. PCI MNL-127 - Erector's Manual - Standards and Guidelines for the Erection of Precast Concrete Products.
26. PCI MNL-135 - Tolerance Manual for Precast and Prestressed Concrete Construction.
27. UL - Underwriter's Laboratories.

1.04 QUALITY ASSURANCE

A. Fabrication, Erection and Welding:

1. Fabricate and perform testing of precast units in accordance with PCI MNL-116 and PCI MNL-117.
2. The precast concrete manufacturer shall be certified by the Precast Concrete Institute (PCI) Certification Program prior to the start of production.
3. Precast concrete manufacturer shall not have less than five (5) years of continuous experience in the manufacture of precast concrete units.
4. The precast concrete manufacturer shall have production capacity to produce required units without causing delay in work.
5. The precast concrete erector shall not have less than five (5) years of continuous experience in the erection of structural precast concrete units.
6. Welding: All welding of structural steel shall be performed by operators who have been qualified within the past year as prescribed in "Qualification Procedures" of the American Welding Society (AWS).

B. Design:

1. Precast units and their connections shall be designed by a licensed, qualified Structural engineer licensed in the State were the project is located, to withstand the loadings and criteria indicated on the drawings and contained within this section. Engineer to have not less than three (3) years of continuous experience in design work of similar scope to that shown on the drawings.

C. Fire Ratings:

1. Precast units shall be designed to meet the project fire ratings as specified by the Architect and as indicated on the drawings.

1.05 SUBMITTALS

A. Shop Drawings:

1. Prepare and submit complete erection and detailed shop drawings for Engineer's approval, including but not limited to the following:

   a. Member piece marks and completely dimensioned size, shape, and type of each member.
   b. Plans and/or elevations locating and defining all products furnished by the manufacturer. Indicate separate face and backup mix locations plus thicknesses and indicate the limits of each finish.
   c. Indicate locations, extent, and treatment of dry joints if two-stage casting is proposed.
   d. Sections and details showing connections, cast-in items, and their relation to the structure.
   e. Methods of connecting, anchoring, fastening, bracing, and attaching work of other trades.
   f. Indicate welded connections by AWS standard symbols.
   g. Indicate size and location of openings, either saw-cut or formed, to be coordinated with other trades.
   h. Joints and openings in units and between units and the structure.
   i. Description of all loose, cast-in and field hardware.
   j. Headers required for openings.

2. Manufacturer shall submit the shop drawings showing wall panel layout to the Mechanical Contractor for review of openings and inserts required by mechanical components.

B. Product Data:

1. Products: Prepare and submit product data for Engineer's approval for shop applied primers, fasteners, grout, and other miscellaneous materials.
2. Samples: Prepare a set of three (3) sample panels approximately 12 by 12 by 2 inches for each type of finish on exposed surfaces illustrating full range of finish, color, and texture variations expected.
3. Mockups: Before installing architectural precast units, build mockups to verify selections made from the Samples Submittal and to demonstrate aesthetic effects and quality of material and workmanship. Build mockups to comply with the following requirements:

   a. Build mockups in the location and to the size indicated by the Architect.
   b. Notify the Architect a minimum of seven (7) days before mockups are to be constructed.

c. Before starting fabrication, obtain the Architect's approval of mockups.
d. Damage part of the exposed face for each color, texture, and finish while in the Architect's presence. Demonstrate materials and techniques for repairs to match adjacent surfaces.
e. Maintain mockups throughout construction in an undisturbed condition as a standard for the completed Work.
f. Demolish and remove mockups when directed.

C. Qualification Data:

1. When requested by the Architect, provide lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

D. Design Calculations:

1. Prepare and submit one complete set of signed and sealed structural calculations to the Architect/Engineer for approval of each unique and distinct precast member and precast connection prepared and certified by a Structural Engineer licensed in the State where the project is located. Architect/Engineer's approval or acceptance of the manufacturer's design calculations shall in no way relieve the manufacturer of the full responsibility for the correctness of the calculations or the structural performance of the completed members or sections.

E. Production Drawings:

1. Be prepared to submit, upon the Owner's request, production drawings indicating the following:

a. Elevation view of each member.
b. Sections and details to indicate quantities, type and position of reinforcing steel, anchors, inserts, etc.
c. Dimensions and finishes.
d. Prestress for strand and concrete strengths.
e. Methods for storage and transportation.

F. Test Reports:

1. Be prepared to submit, upon the Owner's request, test reports showing compliance with the testing provisions contained in PCI MNL-116 and PCI MNL-117.

G. Certifications:

1. Submit manufacturer's certifications that the precast units have been fabricated to meet the fire ratings specified by the Architect.
2. Submit copies of welding procedures and personnel.
3. Submit material certificates indicating that each manufacturer is in compliance with requirements for admixture, concrete materials, reinforcing materials, bearing pads, and water absorption tests.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Precast units shall be transported, stored, and erected in a manner that will avoid any damage or deformation. Precast units shall be lifted and supported during manufacturing, stock-piling, transporting and erection operations only at the lifting and/or supporting points shown on the approved shop drawings.

B. Store units at the project site in such a manner to prevent cracking, distortion, staining, or other physical damage, and so that markings are visible. Protect edges of precast units from chipping or spalling.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Concrete Materials:

1. Refer to Section 03 30 00, Cast-in-Place Concrete, for additional information and requirements for concrete, formwork, materials application, admixtures, accessories, etc.
2. Portland Cement: ASTM C150, Type I or III, gray and white.
    a. Standard gray Portland cement may be used for non-exposed backup concrete.
3. Portland Limestone Cement: ASTM C595, Type IL.
    a. Standard Portland limestone cement may be used for non-exposed backup concrete.
    b. Portland limestone cement is preferred instead of Portland cement where available.
4. Normal-Weight Aggregates: ASTM C33
    a. Face-Mix Coarse Aggregates: Selected, hard, and durable; free of material that reacts with cement or causes staining.
    b. Face-Mix Fine Aggregates: Selected, natural or manufactured sand of the same material as coarse aggregate, unless otherwise approved by the Architect.
5. Admixtures - As determined by the precast manufacturer, but conforming to:
    a. Air-entraining Admixtures: ASTM C260.
    b. Chemical Admixtures: ASTM C494.
    c. Fly Ash: ASTM C618, Class C or F.
    d. Silica Fume: ASTM C1240.
    e. CO2 mineralized concrete: ASTM C494.
6. Water - Potable and free from foreign materials in amounts harmful to concrete and embedded steel.

B. Anchors, Inserts and Connection Material:

1. Steel Plates and Shapes - ASTM A36.
2. Anchor Rods - ASTM F1554.
3. Deformed Bar Anchors - ASTM A496.
4. Steel Headed Studs - AWS D1.1, Type B.

5. High-Strength Bolts - ASTM F3125, Grade A325.
6. Welding Electrodes - Comply with AWS standards.

C. Grout:

1. Cement Grout - Portland cement, ASTM C150, Type I, and clean, natural sand, ASTM C144. Mix at a ratio of 1.0 part cement to 2.5 parts sand, by volume, with minimum water required for placement and hydration. Minimum compressive strength to be 3000 psi.
2. Non-metallic, non-shrink grout - Grout shall be a pre-mixed, non-metallic, non-corrosive, non-staining product, containing selected silica sand, Portland cement, shrinkage compensating agents, plasticizing and water reducing agents, and complying with ASTM C1107. Minimum compressive strength to be 7,000 psi at 28 days.

D. Bearing Pads: Manufacturer to choose one of the following.

1. Elastomeric Pads: AASHTO M251, plain, vulcanized, 100 percent polychloroprene (neoprene) elastomer, molded to size or cut from a molded sheet, 50 to 70 Shore A durometer, minimum tensile strength 2250 psi per ASTM D412.
2. Random-Oriented, Fiber-Reinforced Elastomeric Pads: Preformed, randomly oriented synthetic fibers set in elastomer. Surface hardness of 70 to 90 Shore A durometer.
3. Cotton-Duck-Fabric-Reinforced Elastomeric Pads: Preformed, horizontally layered cotton-duck fabric bonded to an elastomer. Surface hardness of 80 to 100 Shore A durometer.
4. Hardboard: AHA A135.4, Class 1, tempered hardboard strips, smooth on both sides.
5. High-Density Plastic: Multimonomer, non-leaching, plastic strip.

E. Insulated Panel Accessories: Manufacturer to choose one of the following insulation types to provide an R-value per Architectural Drawings.

1. Extruded-Polystyrene Board Insulation: Rigid, cellular polystyrene thermal insulation formed from polystyrene base resin by an extrusion process using HCFCs as blowing agents; square edged; complying with ASTM C578, Type IV; 1.6 lb/cu. ft. minimum density.
2. Polyisocyanurate Board Insulation: Rigid, cellular polyisocyanurate thermal insulation with core formed by using HCFCs as blowing agents; square edged; complying with ASTM A1289, Type II, with non-asphaltic facers.

F. Noncomposite Wythe Connectors:

1. Glass-fiber and vinyl-ester polymer connectors, polypropylene pin connectors, or stainless-steel pin connectors manufactured to connect wythes of precast concrete panels without shear transfer.

2.02 CONCRETE MIXES

A. Concrete shall achieve a minimum 28-day compressive strength of 5000 psi.

B. Prestressed concrete shall achieve a minimum release strength of 3500 psi.

2.03 FABRICATION AND MANUFACTURER

A. Fabricate precast member in plastic lined or metal forms which are true to line and plane. Form openings of 100 square inches in area.

1. Edge and Corner Treatment: Uniformly chamfered.

B. Contractor shall identify opening locations to precast manufacturer for coordination and shall provide precaster with cast-in items required by other trades.

C. Manufacture units in compliance with PCI MNL-116 and PCI MNL-117. Comply with the tolerances specified in PCI MNL-116 and PCI MNL-117.

D. Clean reinforcement of loose rust, mill scale, and other materials, which may reduce or destroy bond with concrete.

E. Place reinforcement to obtain at least the minimum coverage for concrete protection as specified by ACI-318. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

F. Install welded wire reinforcement in longest lengths practical. Lap adjoining pieces one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

G. Cast in structural inserts, plates and accessories as indicated on the drawings and as determined by the fabricator for erection and anchorage. Cast in architectural accessories to receive windows, dowels, waterstops, flashings and other similar work.

H. Provide cast-in-place or structural steel headers for openings larger than one slab width according to fabricator's written recommendations.

I. Provide permanent markings to identify pick-up points and orientation in structure, complying with the markings indicated on approved shop drawings. Imprint date of casting on each precast unit on a surface, which will not show in the structure.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas and conditions under which Work is to be performed and notify the General Contractor in writing of conditions detrimental to proper and timely completion of the Work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

B. Do not install precast concrete units until supporting concrete has attained 75% of its design compressive strength.

3.02 ERECTION

A. The Contractor shall be responsible for:

1. Providing suitable access to the site, proper drainage, and firm, level bearing for the hauling and erection equipment to operate under their own power.
2. At time of delivery, provide area inside and outside the building to allow adequate maneuverability for erection procedures.
3. Placement and accurate alignment of anchor bolts, plates or dowels in footings or foundation walls, ledge angles and other field placed support units.
4. Provide all shoring and bracing required by manufacturer's recommendations and as indicated on the precast shop drawings.

B. Install bearing pads on true, level, and uniform bearing surfaces. Maintain the correct position of the pads until precast units are in place.

C. Locate lifting hooks as specified on the shop drawings.

D. Erect units in compliance with PCI MNL-127.

E. After precast units are in place, remove lifting hooks and handling inserts, level bottom of slab to correct for unequal camber prior to grouting, and perform necessary welding in accordance with AWS D1.1.

F. Shore and brace precast units to maintain location, stability, and alignment until permanent connections are established.

G. Precast units shall be properly aligned and leveled as required by the shop drawings.

H. Remove hoisting or shoring devices and fill voids with sand-cement grout to be flush to adjacent surfaces.

I. Repair damaged metal surfaces by cleaning and applying a coat of galvanizing repair paint to galvanized surfaces or repainting damaged surfaces. Damage to those surfaces having special finishes as specified, shall be brought to the attention of the Architect.

J. Use flowable cement grout to grout keyways between hollow core slabs as follows:

1. Clean and prepare keyways to be filled. Joints should be free of debris and dust.
2. Seal underside of slab joints to prevent grout leakage.
3. Fill grout keys full and strike flush with top surface.
4. Remove grout that seeps through to ceiling below before grout hardens.

K. Use non-metallic, non-shrink grout at wall panels and columns where required by the precast manufacturer's shop drawings. Retain grout in place until hard enough to support itself. Pack spaces with stiff grout until all voids are filled and flush with adjacent surfaces. Keep grouted joints damp for not less than 24 hours after initial set. Promptly remove grout material from exposed surfaces before it affects finishes or hardens. Grouting shall follow closely behind the erection of precast wall panels and columns.

L. Welding: Comply with AWS D1.1 and AWS D1.4

1. Protect precast concrete units and bearing pads from damage by field welding or cutting, and provide noncombustible shields as required.

M. Installation and caulking of the precast units shall be supplied by the precast manufacturer.

N. Field Touchup:

1. Immediately after erection, field welding and/or final bolting, clean exposed surfaces of precast concrete units after erection to remove weld marks, other markings, dirt and stains.

3.03 FIELD QUALITY CONTROL

A. The contractor may choose to employ a separate testing laboratory to evaluate the precast manufacturer's quality control and testing methods. If requested, the precast manufacturer shall allow the Owner's testing company access to the manufacturing facility and provide samples of material for additional evaluation.

B. Precast units which do not conform to specified requirements, including strength, tolerances, and finishes, or which are damaged during handling and erection, shall be replaced with precast concrete units that meet the requirements of this specification.

C. The contractor shall be responsible for the cost of corrections to other work affected by or resulting from corrections to precast concrete work.

D. Precast units having dimensions greater than required will be rejected if appearance or function of the structure is adversely affected, or if larger dimensions interfere with other construction. The contractor shall be responsible for the cost of necessary repair, removal, and replacement of rejected units.

E. The precast supplier shall inspect all field cutting, which cuts reinforcing. The precast manufacturer shall issue a letter to the Owner either accepting the system as modified or directing corrective procedures to offset cut reinforcing. The contractor shall be responsible for the cost of any corrective procedures.

F. Clean all exposed surfaces after erection to remove weld marks, other markings, stains, and dirt. Wash and rinse according to manufacturer's recommendations. Protect other work from damage or staining during cleaning operations.

END OF SECTION 03 41 00

SECTION 03 54 00
CAST UNDERLAYMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Liquid-applied self-leveling floor underlayment.

1.02 RELATED REQUIREMENTS

A. Section 01 70 00 - Execution and Closeout Requirements: Alteration project procedures; selective demolition for remodeling.

1.03 REFERENCE STANDARDS

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 50 mm [2 in.] Cube Specimens); 2024.

B. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2022.

C. ASTM C348 - Standard Test Method for Flexural Strength of Hydraulic-Cement Mortars; 2021.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's data sheets documenting physical characteristics and product limitations of underlayment materials. Include information on surface preparation, environmental limitations, and installation instructions.

C. Certificate: Certify that products meet or exceed specified requirements.

D. Manufacturer's Instructions.

1.05 QUALITY ASSURANCE

A. Applicator Qualifications: Company specializing in performing the work of this section, and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Keep dry and protect from direct sun exposure, freezing, and ambient temperature greater than 105 degrees F.

1.07 FIELD CONDITIONS

A. Do not install underlayment until floor penetrations and peripheral work are complete.

B. Maintain minimum ambient temperatures of 50 degrees F 24 hours before, during and 72 hours after installation of underlayment.

C. During the curing process, ventilate spaces to remove excess moisture.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Cementitious Underlayment:
   1. ARDEX Engineered Cements; ARDEX V 1200 with ARDEX P51 Primer: www.ardexamericas.com/#sle.
   2. Custom Building Products; CL-150 Self-Leveling Underlayment: www.custombuildingproducts.com/#sle.
   3. Dayton Superior Corporation: www.daytonsuperior.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 MATERIALS

A. Cast Underlayments, General:
   1. Comply with applicable code for combustibility or flame spread requirements.
   2. Provide certificate of compliance from authority having jurisdiction indicating approval of underlayment materials in the required fire rated assembly.

B. Cementitious Underlayment: Blended cement mix, that when mixed with water in accordance with manufacturer's directions will produce self-leveling underlayment with the following properties:
   1. Compressive Strength: Minimum 4000 pounds per square inch after 28 days, tested per ASTM C109/C109M.
   2. Flexural Strength: Minimum 1000 psi after 28 days, tested per ASTM C348.
   3. Density: 125 pounds per cubic foot, nominal.
   4. Final Set Time: 1-1/2 to 2 hours, maximum.
   5. Thickness: Capable of thicknesses from feather edge to maximum 3-1/2 inch.
   6. Surface Burning Characteristics: Flame spread/Smoke developed index of 0/0 in accordance with ASTM E84.

C. Aggregate: Dry, well graded, washed silica aggregate, approximately 1/8 inch in size and acceptable to underlayment manufacturer.

D. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to underlayment mix materials.

E. Primer: Manufacturer's recommended type.

F. Joint and Crack Filler: Latex based filler, as recommended by manufacturer.

2.03 MIXING

A. Site mix materials in accordance with manufacturer's instructions.

B. Add aggregate for areas where thickness will exceed 1/2 inch. Mix underlayment and water for at least two minutes before adding aggregate, and continue mixing to assure that aggregate has been thoroughly coated.

C. Mix to self-leveling consistency without over-watering.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are clean, dry, unfrozen, do not contain petroleum byproducts, or other compounds detrimental to underlayment material bond to substrate.

3.02 PREPARATION

A. Concrete: Mechanically prepare steel troweled concrete to create a textured surface necessary to achieve the best bond; acceptable methods include bead blasting and scarifying. Do not use acid etching.

B. Remove substrate surface irregularities. Fill voids and deck joints with filler. Finish smooth.

C. Vacuum clean surfaces.

D. Prime substrate in accordance with manufacturer's instructions. Allow to dry.

E. Close floor openings.

3.03 APPLICATION

A. Install underlayment in accordance with manufacturer's instructions.

B. Pump or pour material onto substrate. Do not retemper or add water.
   1. Pump, move, and screed while the material is still highly flowable.
   2. Be careful not to create cold joints.
   3. Wear spiked shoes while working in the wet material to avoid leaving marks.

C. Place to indicated thickness, with top surface level to 1/8 inch in 10 ft.

D. For final thickness over 1-1/2 inches, place underlayment in layers. Allow initial layer to harden to the point where the material has lost its evaporative moisture. Immediately prime and begin application of the subsequent layer within 24 hours.

E. Where additional aggregate has been used in the mix, add a top layer of neat mix (without aggregate), if needed to level and smooth the surface.

F. If a fine, feathered edge is desired, steel trowel the edge after initial set, but before it is completely hard.

3.04 CURING

A. Once underlayment starts to set, prohibit foot traffic until final set has been reached.

B. Air cure in accordance with manufacturer's instructions.

3.05 PROTECTION

A. Protect against direct sunlight, heat, and wind; prevent rapid drying to avoid shrinkage and cracking.

B. Do not permit traffic over unprotected floor underlayment surfaces.

END OF SECTION 03 54 00

SECTION 04 20 00
UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Clay facing brick.

B. Mortar and grout.

C. Reinforcement and anchorage.

D. Flashings.

E. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Installation of dovetail slots for masonry anchors.

B. Section 06 10 00 - Rough Carpentry: Nailing strips built into masonry.

C. Section 07 21 00 - Thermal Insulation: Insulation for cavity spaces.

D. Section 07 25 00 - Weather Barriers: Water-resistive barriers applied to exterior face of backing sheathing or unit masonry substrate.

E. Section 07 62 00 - Sheet Metal Flashing and Trim: Through-wall masonry flashings.

F. Section 07 84 00 - Firestopping: Firestopping at penetrations of fire-rated masonry and at top of fire-rated walls.

G. Section 07 92 00 - Joint Sealants: Sealing control and expansion joints.

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

B. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2024.

C. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2009a (Reapproved 2014).

D. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2022.

E. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2024.

F. ASTM C91/C91M - Standard Specification for Masonry Cement; 2023.

G. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2023.

H. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2018.

I. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.

J. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2018.

K. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale); 2023.

L. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019a, with Editorial Revision.

M. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2024.

N. ASTM C476 - Standard Specification for Grout for Masonry; 2023.

O. ASTM C780 - Standard Test Methods for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2023.

P. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2016.

Q. ASTM C1714/C1714M - Standard Specification for Preblended Dry Mortar Mix for Unit Masonry; 2019a.

R. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing; 2017.

S. BIA Technical Notes No. 13 - Ceramic Glazed Brick Exterior Walls; 2017.

T. BIA Technical Notes No. 28B - Brick Veneer/Steel Stud Walls; 2005.

U. BIA Technical Notes No. 46 - Maintenance of Brick Masonry; 2017.

V. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all relevant installers.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.

C. Samples: Submit four samples of facing brick units to illustrate color, texture, and extremes of color range.

D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

E. Manufacturer's Certificate: Certify that water repellent admixture manufacturer has certified masonry unit manufacturer as an approved user of water repellent admixture in the manufacture of concrete block.

F. Test Reports: Concrete masonry manufacturer's test reports for units with integral water repellent admixture.

G. Manufacturer's Qualification Statement.

H. Installer's Qualification Statement.

I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.

1.06 QUALITY ASSURANCE

A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.

B. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section with minimum five years of documented experience.

C. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.

1.07 MOCK-UPS

A. Construct a masonry wall as a mock-up panel sized 8 feet long by 6 feet high; include mortar, accessories, structural backup, wall openings, flashings (with lap joint, corner, and end dam), and wall insulation in mock-up.

B. Locate where directed.

C. Mock-up may remain as part of work.

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.

PART 2 PRODUCTS

2.01 BRICK UNITS

A. Basis of Design: Endicott Face Brick; Desert Ironspot Dark Velour, Modular Brick. by Riverstone Group; Contact: Justin Roessler (309) 743-3654.

B. Other Acceptable Manufacturers that must match basis of design aesthetic and approved by architect prior to bid opening:
   1. Substitutions: See section 01 60 00 - Product Requirements.

C. Facing Brick Type 1: ASTM C216, Type FBX, Grade SW.
   1. Endicott Clay Products Co; Dark Ironspot Velour
   2. Modular size: _____.
   3. Special shapes: Molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect.

2.02 MORTAR AND GROUT MATERIALS

A. Masonry Cement: ASTM C91/C91M, Type N.
   1. Colored Mortar: Premixed cement as required to match Architect's color sample.

B. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.

C. Hydrated Lime: ASTM C207, Type S.

D. Mortar Aggregate: ASTM C144.

E. Grout Aggregate: ASTM C404.

F. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
   1. Color(s): As selected by Architect from manufacturer's full range.

G. Water: Clean and potable.

H. Packaged Dry Material for Mortar for Unit Masonry: Premixed Portland cement, hydrated lime, and sand; complying with ASTM C1714/C1714M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.
   1. Type: Type N.
   2. Color: Mineral pigments added as required to produce approved color sample.

I. 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.
   1. Type: Fine.

2.03 REINFORCEMENT AND ANCHORAGE

A. Manufacturers:
   1. Blok-Lok Limited: www.blok-lok.com/#sle.
   2. Hohmann & Barnard, Inc: www.h-b.com/#sle.
   3. WIRE-BONDwww.wirebond.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi), deformed billet bars; galvanized.

C. Joint Reinforcement: Use ladder type joint reinforcement where vertical reinforcement is involved and truss type elsewhere, unless otherwise indicated.

D. Single Wythe Joint Reinforcement: ASTM A951/A951M.
   1. Type: Truss or ladder.
   2. Material: ASTM A1064/A1064M steel wire, hot dip galvanized after fabrication to 16 CFR 1201 Class B.

3. Size: 0.1483 inch side rods with 0.1483 inch cross rods; width as required to provide not less than 5/8 inch of mortar coverage on each exposure.

E. Flexible Anchors: 2-piece anchors that permit differential movement between masonry and building frame, sized to provide not less than 5/8 inch of mortar coverage from masonry face.

F. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
1. Anchor plates: Not less than 0.075 inch thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
2. Wire ties: Manufacturer's standard shape, 0.1875 inch thick.
3. Vertical adjustment: Not less than 3-1/2 inches.

G. Screw or Wedge Type Masonry Pin Anchor
1. Hilti or approved equal.

2.04 FLASHINGS

A. Membrane Asphaltic Flashing Materials:
1. Rubberized Asphalt Flashing: Self-adhering polymer modified asphalt sheet; 40 mils (0.040 inch) minimum total thickness; 8 mil cross-laminated polyethylene bonded to adhesive rubberized asphalt, with a removable release liner.
a. Manufacturers:
1) Advanced Building Products, Inc: www.advancedbuildingproducts.com/#sle.
2) Heckmann Building Products, Inc: www.heckmannbuildingprods.com/#sle
3) WIRE-BOND: www.wirebond.com/#sle.
4) IPCO; www.illinoisproducts.com.
5) Substitutions: See Section 01 60 00 - Product Requirements.

B. Flashing Sealant/Adhesives: Silicone, polyurethane, or silyl-terminated polyether/polyurethane or other type required or recommended by flashing manufacturer; type capable of adhering to type of flashing used.

C. Termination Bars: Stainless steel; compatible with membrane and adhesives.

D. Drip Edge: Stainless steel; angled drip with hemmed edge; compatible with membrane and adhesives.

E. Lap Sealants and Tapes: As recommended by flashing manufacturer; compatible with membrane and adhesives.

2.05 ACCESSORIES

A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.

B. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self expanding; in maximum lengths available.

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) Advanced Building Products, Inc; Mortar Break DT: www.advancedbuildingproducts.com/#sle.
2) Mortar Net Solutions; MortarNet: www.mortarnet.com/#sle.
3) York Manufacturing, Inc: www.yorkmfg.com/#sle.
4) Substitutions: See Section 01 60 00 - Product Requirements.

D. Weeps:
1. Type: Extruded propylene with honeycomb design.

2. Color(s): As selected by Architect from manufacturer's full range.
3. Manufacturers:
    a. Advanced Building Products, Inc: www.advancedbuildingproducts.com/#sle.
    b. Blok-Lok Limited: www.blok-lok.com/#sle.
    c. Hohmann & Barnard, Inc: www.h-b.com/#sle.
    d. WIRE-BOND: www.wirebond.com/#sle.
    e. Substitutions: See Section 01 60 00 - Product Requirements.

E. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.06 MORTAR AND GROUT MIXING

A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
1. Exterior, non-loadbearing masonry: Type N.
2. Interior, non-loadbearing masonry: Type N.

B. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.

C. Grout: ASTM C476; consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

D. Admixtures: Add to mixture at manufacturer's recommended rate and in accordance with manufacturer's instructions; mix uniformly.

E. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that related items provided under other sections are properly sized and located.

C. 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.

3.03 COLD AND HOT WEATHER REQUIREMENTS

A. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.

B. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

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. Brick Units:
1. Bond: Running.
2. Mortar Joints: Concave.

3.05 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Lay hollow masonry units with face shell bedding on head and bed joints.

C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

D. Remove excess mortar and mortar smears as work progresses.

E. Interlock intersections and external corners.

F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

3.06 WEEPS/CAVITY VENTS

A. Install weeps in veneer walls at 24 inches on center horizontally on top of through-wall flashing at bottom 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 cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.

3.08 REINFORCEMENT AND ANCHORAGE - GENERAL AND SINGLE WYTHE MASONRY

A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches on center.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

C. Place continuous joint reinforcement in first and second joint below top of walls.

D. Lap joint reinforcement ends minimum 6 inches.

E. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 36 inches horizontally and 24 inches vertically.

3.09 MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
   1. Extend flashings full width at such interruptions and at least 6 inches, minimum, into adjacent masonry or turn up flashing ends at least 1 inch, minimum, to form watertight pan at nonmasonry construction.
   2. Remove or cover protrusions or sharp edges that could puncture flashings.
   3. Seal lapped ends and penetrations of flashing before covering with mortar.

B. Terminate flashing up 8 inches minimum on vertical surface of backing:
   1. Install vertical leg of flashing over fluid-applied or self-adhered air/vapor barriers over backing or per manufacturer’s directions.
   2. Anchor vertical leg of flashing into backing with a termination bar and sealant.
   3. Apply cap bead of sealant on top edge of self-adhered flashing.

C. Install flashing in accordance with manufacturer's instructions and BIA Technical Notes No. 7.

D. Extend metal flashings through exterior face of masonry and terminate in an angled drip with hemmed edge. Install joint sealer below drip edge to prevent moisture migration under flashing.

E. Extend EPDM and _____ flashings to within 1/2 inch of exterior face of masonry and adhere to top of stainless steel angled drip with hemmed edge.

F. Lap end joints of flashings at least 6 inches, minimum, and seal watertight with flashing sealant/adhesive.

3.10 LINTELS

A. Install loose steel lintels over openings.

B. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled.

3.11 GROUTED COMPONENTS

A. Lap splices minimum 24 bar diameters.

B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

C. Place and consolidate grout fill without displacing reinforcing.

D. At bearing locations, fill masonry cores with grout for a minimum 12 inches either side of opening.

3.12 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control or expansion joints.

B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

C. Size control joints as indicated on drawings; if not indicated, 3/4 inch wide and deep.

3.13 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. Do not build into masonry construction organic materials that are subject to deterioration.

3.14 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 Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch.

G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.15 CUTTING AND FITTING

A. Cut and fit for chases, pipes, conduit, and sleeves. 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.

3.16 PARGING

A. Dampen masonry walls prior to parging.

3.17 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00 - Quality Requirements.

B. Mortar Tests: Test each type of mortar in accordance with ASTM C780, testing with same frequency as masonry samples.

3.18 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.

3.19 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION 04 20 00

SECTION 04 22 00
REINFORCED UNIT MASONRY

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Supply and installation of all reinforced concrete unit masonry work (concrete unit masonry, mortar, grout, reinforcement, anchors, and ties) and accessories as shown on the drawings and herein specified.

B. Products installed but not furnished under this section:

1. Masonry veneer.

C. Structural notes indicated on the drawings regarding reinforced unit masonry shall be considered part of this specification.

1.02 RELATED WORK

A. Section 03 30 00 - Cast-in-Place Concrete.

B. Section 05 12 23 - Structural Steel.

C. Section 05 21 00 - Steel Joists.

D. Section 31 23 00 - Foundation Excavating and Backfilling.

1.03 REFERENCES

A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards except where more stringent requirements are shown or specified. Where any provision of other pertinent codes and standards conflict with this specification, the more stringent provision shall govern.

1. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
2. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units.
3. ASTM C270 - Standard Specification for Mortar for Unit Masonry.
4. ASTM C387 - Specification for Packaged, Dry, Combined Materials for Concrete and High Strength Mortar.
5. ASTM C476 - Standard Specification for Grout for Masonry.
6. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
7. ASTM C1019 - Standard Test Method for Sampling and Testing Grout.
8. International Masonry Industry All-Weather Council (IMIAC) - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.
9. TMS 402/602 - Building Code Requirements and Specifications for Masonry Structures.
10. UL - Underwriters Laboratories.

1.04 QUALITY ASSURANCE

A. Installation Company: Company shall have not less than five (5) years of documented experience in the construction of masonry projects of similar scope and complexity.

B. For the actual cutting and placing of concrete masonry units, use only skilled masons who are thoroughly experienced with the material and methods specified and thoroughly familiar with the design requirements. Workers shall have not less than three (3) years of documented experience in the construction of masonry walls.

C. Fire Resistance: Whenever a fire-resistant classification is indicated for unit masonry construction, provide concrete block units as tested and listed for the particular fire-resistant construction.

D. The governing building department reserves the right to take samples and make material tests prior to or during construction, without expense to the Contractor. Materials found to be defective shall be removed and replaced.

1.05 SUBMITTALS

A. Prepare and submit product data for the Engineer's approval. Data should include all horizontal reinforcement, anchoring devices, and all other embedded items herein specified.

B. Prepare and submit shop drawings detailing the fabrication, bending, and placement of reinforcing bars. Provide wall elevations showing reinforcement layout.

C. Samples: When requested by the Architect and before any materials are delivered to the Worksite, submit for approval one sample of the proposed masonry materials, showing the full range of colors and textures available.

D. Certificates:

1. Submit a letter of certification from the manufacturer of the concrete masonry units certifying all concrete masonry units delivered to the worksite are in strict conformance with the provisions of this specification.
2. Submit concrete unit masonry compressive strength test results demonstrating the units meet the specified strength. Test must be conducted by a qualified independent testing agency.

E. Submit mortar mix design and test results as follows:

1. Mix designs shall indicate type and proportions of ingredients in compliance with the proportion requirements of ASTM C270.
2. For mix designs not in accordance with the proportion requirements of ASTM C270, the mortar test history must be performed in accordance with ASTM C780 to verify performance with property requirements of ASTM C270. Tests must meet the type of mortar specified on the drawings. Tests must be done by a qualified independent testing agency.

F. Submit grout mix designs and test results as follows:

1. Mix designs shall indicate type and proportions of the ingredients in compliance with the proportion requirements of ASTM C476.

2. For mix designs not in accordance with the proportion requirements of ASTM C476, the grout test history must be performed in accordance with ASTM C1019 to verify performance with property requirements of ASTM C476. Tests must meet the type of grout specified on the drawings. Test must be done by a qualified independent testing agency.

    a. Perform one test prior to construction and perform at least one test during construction for each 5000 square feet of wall.

1.06 MOCKUP

A. Prior to installation of masonry work, erect sample wall panel to further verify color and texture characteristics of selected masonry units and mortar and to demonstrate the level of workmanship required for the unit masonry.

B. Construct mockup at the site, where directed. Mockup shall be full thickness four-foot high by four-foot long, including face and back-up wythes, as well as all accessories. Mockup shall indicate the proposed range of color, texture, and quality of workmanship to be expected in the completed work.

C. Obtain the Architect's acceptance of visual qualities of the mockup before start of masonry work.

D. Retain mockup during construction as a standard for judging completed masonry work.

E. Construct mockup panels for the following walls:

1. Interior masonry wall construction.
2. Exterior masonry wall construction.
3. .

F. Demolish and remove mockups from site when directed by the Architect/Engineer.

G. Mockups may remain as part of work when directed by the Architect/Engineer.

1.07 DELIVERY, STORAGE, AND HANDLING

A. All masonry units shall be delivered to the worksite and stacked on pallets to allow the circulation of air through all units. Cover with a waterproof covering anchored to prevent displacement during high winds.

B. Masonry accessories, including reinforcing steel, shall be stored clear of the ground to prevent deterioration or damage due to moisture, temperature changes, contaminants, and corrosion.

C. Deliver all materials in sufficient quantity and time to maintain approved construction schedule.

D. Deliver all packaged materials in manufacturer's original containers, with labels and markings intact and legible.

E. Immediately remove all damaged materials or containers from site and replace with new items.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Concrete Masonry Units: ASTM C90, Grade N-1 as follows:

1. Weight: As indicated on the drawings.
2. Compressive Strength: As indicated on the drawings.
3. Nominal Size: As indicated on the drawings.
4. Actual Size: 3/8" less than nominal size.
5. Aggregates:

    a. Normal Weight: ASTM C33.
    b. Lightweight: ASTM C331.

6. Provide special units for 90-degree corners, lintels jambs, sash, control joints, headers, bond beams, and other special conditions conforming to ASTM C90.
7. All exposed unit masonry shall be free of chips, cracks, and other imperfections.

B. Mortar and Grout:

1. Compressive Strength: As indicated on the drawings.
2. Mortar type for masonry construction shall be as designated in the General Notes of the drawings.
3. Portland Cement: ASTM C150, Type I, non-staining, no air entraining, natural color cement.
4. Blended Cement: ASTM C595.
5. Masonry Cement: ASTM C91.
6. Mortar Aggregate: ASTM C144, standard masonry type sand .
7. Hydrated Lime: ASTM C207.
8. Quicklime: ASTM C5, non-hydraulic type.
9. Premix Mortar: ASTM C387, using gray cement, normal strength.
10. Grout Aggregate: ASTM C404 Pea gravel with not more than 5% passing the No. 8 sieve and 100% passing the 3/8-inch sieve .
11. Grout Fine Aggregate: Sand.
12. Water: Clean and potable.
13. Do not use calcium chloride in mortar or grout.

C. Joint Reinforcement:

1. Provide joint reinforcement formed from galvanized carbon-steel wire in accordance with ASTM A641, Class 1 for interior walls; and ASTM A153, Class B-2, for exterior walls.
2. Provide welded wire units prefabricated with 9 gauge deformed continuous side rods and 9 gauge plain cross rods into straight lengths of not less than 10 feet with matching corner and tee units. Unit widths to be 1-1/2 to 2 inches less than the wall thickness.
3. For multi-wythe concrete masonry walls, provide truss type reinforcement with a third side rod extending out into the other wythe.

D. Ties and Anchors:

1. Rigid wall anchors shall be fabricated of 1/4 inch thick mild steel, 1 inch wide by 24 inches long, with ends turned up.
2. Wall ties shall be corrugated 7/8 inch wide by 7 inches long, minimum 16 gauge galvanized steel.

3. Structural steel column anchor ties shall be adjustable weld-on 1/4 inch diameter steel rods and minimum 3/16 inch galvanized triangular shaped tie.
4. For anchorage to concrete, use dovetail sheet metal anchor sections and triangular shaped 16 gauge wire tie sections sized to extend within 1 inch of masonry face.

E. Reinforcement: As indicated on the drawings.

F. Control and Expansion Joints:

1. Control joint material for unit masonry shall consist of cross-shaped extruded polyvinyl gaskets sized to match wall thickness.
2. Expansion or joint filler material, unless otherwise indicated, shall be 1/2 inch thick asphalt impregnated cellular board.
3. Compressible filler shall be pre-molded filler strips complying with ASTM D1056, Type 2, Class A, Grade 1; compressible up to 35 percent of width and thickness indicated.
4. Bond breaker strips shall be asphalt-saturated, organic roofing felt complying with ASTM D226, Type I (No. 15 asphalt felt).

G. Breath Wicks: 3/16 inch diameter cotton sash cord or glass fiber rope. Provide 2 inches of exposure to the outside and space wicks at 18 inches on center along the wall.

H. Insulation Board: Refer to Board Insulation in Division 7.

I. Masonry cleaners shall be non-acidic and not harmful to masonry workers or adjacent materials.

J. Bonding Agent: Larson Products Corporation "Plasterweld" as distributed by Pioneer Builder's Supplies, Inc. Los Angeles, California or approved equivalent.

K. Waterproofing Agent: "Red Label Suconem" by Sika Corporation or approved equivalent.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify field conditions are acceptable and are ready to receive work.

1. Verify foundations are constructed with tolerances conforming to the requirements of ACI 117.
2. Verify reinforcing dowels are positioned in accordance with the drawings.

B. Verify items provided by other Sections of work are properly sized and located.

C. Verify built-in items are in proper location and ready for roughing into masonry work.

D. Beginning of installation means Installer accepts existing conditions.

3.02 PREPARATION

A. Layout walls in advance for accurate spacing of bond patterns, with uniform joint widths and to properly locate openings, expansion joints, and offsets.

B. Direct and coordinate placement of metal anchors supplied to other Sections.

C. The Contractor is responsible to design, provide, and install bracing that will ensure stability of masonry during construction. Maintain in place until building structure provides permanent bracing.

D. Remove laitance, loose aggregate, and anything else that would prevent mortar from bonding to the foundation.

E. Clean all reinforcement by removing mud, oil, or other materials that will adversely affect or reduce bond at the time mortar or grout is placed.

3.03 COLD WEATHER CONSTRUCTION

A. When ambient temperature is below 40F, implement cold weather procedures.

B. Special cold weather requirements for various temperature ranges are as follows:

1. Air temperature 40F to 32F: Sand or mixing water shall be heated to produce mortar temperatures between 40F to 120F.
2. Air temperature 32F to 25F:

    a. Sand and mixing water shall be heated to produce mortar temperatures between 40F to 120F. Maintain temperature of mortar on boards above freezing.
    b. Grout aggregates and mixing water shall be heated to produce grout temperature between 70F to 120F.

3. Air temperature 25F to 20F: Comply with requirements for air temperature between 32F to 25F and the following:

    a. Provide heat sources on both sides of the wall under construction to heat masonry surfaces to 40F. Windbreaks shall be used when wind is in excess of 15 miles per hour.
    b. Heat masonry to a minimum temperature of 40F prior to grouting.

4. Air temperature 20F and below: Comply with requirements for air temperature between 32F to 20F and the following:

    a. Enclosure and auxiliary heat shall be provided to maintain air temperature above freezing. Do not lay masonry units having a temperature below 20F.

C. Cold-Weather Protection:

1. When the mean daily air temperature is 40F to 25F, masonry shall be completely covered for 24 hours with weather-resistive membrane.
2. When the mean daily air temperature is 25F to 20F, masonry shall be completely covered for 24 hours with insulating blankets with a weather-resistive covering. Extend time period to 48 hours for grouted masonry.
3. When the mean daily air temperature is 20F or below, masonry temperature shall be maintained above freezing for 24 hours by enclosure and auxiliary heating. Extend time period to 48 hours for grouted masonry.

D. Do not lay masonry units having either a temperature below 20F or containing frozen moisture, visible ice, or snow on their surfaces.

E. Remove visible ice and snow from the top surface of existing foundations and masonry to receive new construction. Heat these surfaces above freezing.

F. Top of all walls not enclosed or sheltered shall be covered with strong weather-resistive material at the end of each day or shutdown.

G. Partially completed walls shall be covered at all times when work is not in progress.

H. Any section of masonry deemed frozen and damaged shall be removed before continuing construction of that section.

I. Masonry units shall be dry at the time of placement. Wet or frozen units shall not be laid.

3.04 HOT WEATHER CONSTRUCTION

A. Hot weather construction is defined when:

1. The ambient air temperature exceeds 100F or exceeds 90F with a wind velocity greater than 8 mph.

B. Hot Weather Procedures:

1. Maintain sand piles in a damp, loose condition.
2. Provide necessary conditions and equipment to produce mortar having a temperature below 120F.
3. Flush mixer, mortar transport container, and mortar boards with cool water before they come in contact with mortar ingredients or mortar.
4. Use mortar within two hours of initial mixing.
5. Fog spray all newly constructed masonry until damp, at least three times a day until the masonry is three days old.
6. Do not spread mortar beds more than 4 feet ahead of masonry. Set masonry within one minute of spreading mortar.

3.05 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement. Grouted cells shall be in vertical alignment.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Lay concrete masonry units in bond to match existing at all patch and infill locations.

D. Unless noted otherwise, provide masonry control joints at 30'-0" on center maximum.

E. Unless noted otherwise, build non-bearing interior partitions walls full height to underside of structure.

3.06 PLACING AND BONDING

A. Unless noted otherwise, construct masonry in running bond pattern.

B. Lay hollow masonry units with face shell bedding on head and bed joints.

C. Bed and Head Joints:

1. Unless otherwise required, construct 3/8 inch thick bed and head joints.

2. At foundation, construct bed joint of the starting course a thickness not less than 1/4 inch, and not more than 3/4 inch.
3. Unless otherwise noted, tool joint with a round jointer when the mortar is thumbprint hard.
4. Remove masonry protrusions extending 1/2 inch or more into cells or cavities to be grouted.
5. Where masonry rests on concrete, the concrete shall be sandblasted or bushed.

D. Collar Joints:

1. Unless otherwise required, solidly fill collar joints less than 3/4 inch wide with mortar as the job progresses.

E. Place hollow units as follows:

1. With face shells of bed joints fully mortared.
2. With webs fully mortared in:

    a. All courses of piers, columns, and pilasters.
    b. In the starting course on foundations.
    c. When necessary to confine grout or loose fill.
    d. When otherwise required.

3. With head joints mortared, a minimum distance from each face equal to the face shell thickness of the unit.
4. Vertical cells to be grouted are aligned and openings are unobstructed.

F. Place solid units as follows:

1. Unless otherwise required, solidly fill bed and head joints with mortar.
2. Do not fill head joints by grouting with mortar.
3. Construct head by shoving mortar tight against the adjoining unit.
4. Do not deeply furrow bed joints.

G. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

H. Remove excess mortar as work progresses.

I. Interlock intersections and external corners.

J. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

K. Perform job site cutting of masonry units with proper tools to provide straight, clean, undamaged edges. Prevent broken masonry unit corners or edges.

L. Isolate masonry partitions from vertical structural framing members with a control joint.

M. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler and pin top of wall with prefabricated partition anchors that allow vertical movement.

3.07 HORIZONTAL REINFORCEMENT AND ANCHORS

A. Install horizontal joint reinforcement as follows:

1. Interior non-load bearing walls - 24 inches on center vertically.
2. Exterior walls and interior load bearing walls - 16 inches on center vertically.
3. Parapet walls - 8 inches on center vertically unless noted otherwise.
4. Foundation walls - 8 inches on center vertically unless noted otherwise.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

C. Place joint reinforcement continuous in first and second joint below top of walls.

D. Lap joint reinforcement ends minimum 6 inches. Extend minimum 16 inches each side of openings.

E. Place joint reinforcement so longitudinal wires are embedded in mortar with a minimum cover of 1/2 inch when not exposed to weather or earth, and 5/8 inch when exposed to weather or earth.

F. Anchor masonry to structural members where masonry abuts or faces such members.

G. Wall Ties:

1. Embed the ends of wall ties in mortar joints. Embed wall tie ends at least 1/2" into the outer face shell of hollow units. Embed wire wall ties at least 1-1/2" into the mortar bed of solid masonry units or solid grouted hollow units.
2. Do not bend wall ties after embedded in grout or mortar.
3. Unless otherwise required, install adjustable ties in accordance with the following requirements.

    a. One tie for each 1.77 square feet of wall area.
    b. Do not exceed 16 inches horizontal or vertical spacing.
    c. The maximum misalignment of bed joints from one wythe to the other is 1-1/4".
    d. The maximum clearance between connecting parts of the ties is 1/16".
    e. When pintle legs are used, provide ties with at least two legs made of wire size W2.8.
    f. Install wire ties perpendicular to a vertical line on the face of the wythe from which they protrude. Where one-piece ties or joint reinforcement is used, the bed joints of adjacent wythes shall align.
    g. Unless otherwise required, provide additional unit ties around all openings larger than 16 inches in either dimension. Space ties around the perimeter of an opening at a maximum of 3 feet on center. Place ties within 12 inches of an opening.

H. Veneer Anchors:

1. Embed veneer anchors in mortar joint and extend into the veneer a minimum of 1-1/2 inch at least 5/8-inch cover to the outside face.
2. Install adjustable veneer anchors as follows:

    a. The maximum misalignment of bed joints from one wythe to the other is 1-1/4 inch.
    b. The maximum clearance between connecting parts of the ties is 1/16 inch.
    c. When pintle legs are used, provide anchors with at least two legs made of wire size W2.8.

d. Provide at least one adjustable two-piece anchor of wire size W1.7 or 22 gauge corrugated sheet metal anchor for each 2.67 square feet of wall area.

3. Space anchors at a maximum of 32 inches horizontally and 16 inches vertically.
4. Provide additional anchors around all openings larger than 16 inches in either dimension. Space anchors around the perimeter of an opening at a maximum of 3 feet on center. Place anchors within 12 inches of an opening.

3.08 VERTICAL REINFORCEMENT

A. Support and secure reinforcing bars from displacement beyond the tolerances allowed by construction loads or by placement of grout or mortar. Maintain position within 1/2 inch of masonry unit or formed surface, but not less than 1/4 inch (only when fine grout is used).

B. Dowels in footings shall be set to align with cores containing reinforcing steel.

C. Place and consolidate grout fill without displacing reinforcing. Completely embed reinforcing bars in grout.

D. All cells containing reinforcing in concrete blocks shall be filled solid with grout.

E. Do not bend reinforcement after it is embedded in grout or mortar.

F. Reinforce masonry unit cores and cavities with vertical reinforcement bars and grout as indicated on the drawings. Place reinforcement and ties in grout spaces prior to grouting.

G. Retain vertical reinforcement in position at top and bottom of cells and at intervals not exceeding 192 bar diameters.

H. Place steel in walls and flexural elements within 1/2 inch of required location.

I. Place vertical bars within 2 inches of the required location along the length of the wall.

3.09 CONCRETE UNIT MASONRY

A. Lay masonry units with core cells vertically aligned and clear of mortar dropping, debris, loose aggregates, and any material deleterious to masonry grout.

B. Do not place grout until height of masonry to be grouted has attained sufficient strength to resist grout pressure.

C. Do not wet concrete masonry units before laying.

D. Grout spaces less than two inches in width with fine grout using low lift grouting techniques. Grout spaces two inches or greater in width with course grout using high lift or low lift grouting techniques.

E. When grouting is stopped for more than one hour, terminate grout 1-1/2 inch below top of upper masonry unit to form a positive key for subsequent grout placement.

F. Grouting:

1. Consolidate grout at time of placement.

    a. Consolidate grout pours 12 inches or less in height by mechanical vibration or by puddling.
    b. Consolidate grout pours exceeding 12 inches in height by mechanical vibration and reconsolidate by mechanical vibration after initial water loss and settlement has occurred.

2. When the grout pour height exceeds 5 feet 4 inches, provide cleanout opening no less than 3 inches high at the bottom of each cell to be grouted by cutting one face shell of masonry unit. Opening should be of sufficient size to permit removal of debris.
3. Pump grout into spaces. Maintain water content in grout to intended slump without aggregate segregation.
4. Wait 30 to 60 minutes before placing next lift.

3.10 GROUTING REINFORCED CONCRETE BLOCK WALLS

A. Provide reinforcing bars at indicated spacing and grout bars and voids solid with grout having a 28-day compressive strength as listed in the General Notes of the drawings.

3.11 GROUTING BLOCK CELLS BELOW LINTELS AND BEAMS

A. For lintel spans greater than 5'-0": Grout block cells.

3.12 LINTELS AND BOND BEAMS

A. Steel Lintels: Install steel lintels supplied from Division 5 of this specification. Provide a minimum of 8 inches of end bearing on each side of opening unless noted otherwise. All exterior exposed steel lintels shall be hot-dip galvanized in accordance with ASTM A123.

B. Bond Beams:

1. Use specially shaped lintel units at hollow masonry unit walls, with reinforcing bars as shown and filled with concrete grout.
2. Provide end bearing at each side of opening as indicated on the drawings.
3. Provide reinforced concrete block lintels over openings less than 3'-0" wide which are not scheduled.
4. Place and consolidate concrete without disturbing the reinforcing.
5. Allow lintels to reach 75 percent of their design strength before removing temporary supports.
6. Do not place vertical control joints above bond beams or within 16 inches each side of bond beam.

3.13 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control and expansion joints except above wall openings.

B. Provide vertical expansion, control, and isolation joints as indicated on the drawings. If joints are not indicated, then provide control joints at a maximum spacing of 30'-0".

C. Install all built-in masonry accessory items as work progresses.

D. Exposed joints to be tooled slightly concave and concealed joints to be struck flush. Use a 3/4-inch diameter round tool for making 1/2-inch joints.

1. Bed Joints: Not less than 3/8-inch and not more than 2-inch thick.
2. Head Joints: To match bed joints.

E. Rake out mortar where sealants are shown or required.

3.14 BUILT-IN WORK AND EMBEDDED ITEMS

A. As work progresses, build in metal door and glazed frames, fabricated metal lintels, anchor bolts, plates, and other items furnished by other Sections.

B. Place pipes and conduits passing horizontally through masonry beams or masonry walls in steel sleeves or cored holes.

C. Install pipes and conduits passing horizontally through non-bearing masonry partitions.

D. Install and secure connectors, flashing, weep holes, weep vents, nailing blocks, and other accessories.

E. Do not embed aluminum conduits, pipes, and accessories in masonry, grout, or mortar, unless effectively coated or covered to prevent aluminum-cement chemical reaction or electrolytic action between aluminum and steel.

F. Build in items plumb and level.

G. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.

H. Do not build in organic materials subject to deterioration.

3.15 PREFABRICATED CONCRETE AND MASONRY ITEMS

A. Erect prefabricated concrete and masonry items in accordance with the requirements.

3.16 TOLERANCES

A. Comply with tolerances in the MSJC Specification and the following:

1. Maximum variation from alignment of columns and pilasters: 1/4 inch.
2. Maximum variation from unit to adjacent unit: 1/32 inch.
3. Maximum variation from plane of wall: 1/4 inch in 10 feet and 3/8 inch in 20 feet or more.
4. Maximum variation from plumb: 1/4 inch per story non-cumulative.
5. Maximum variation from level coursing: 1/8 inch in 3 feet and 1/4 inch in 10 feet; 1/2 inch in 30 feet.
6. Maximum variation of bed joint thickness: 1/8 inch.

3.17 CUTTING AND FITTING

A. Cut and fit for chases, pipes, conduit, sleeves, and structural members. Coordinate with other Sections of work to provide correct size, shape, and location.

B. Obtain the Engineer's approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.18 CLEANING

A. Remove excess mortar and mortar smears.

B. Replace defective mortar.

C. Clean soiled surfaces with cleaning solution.

D. Use non-metallic tools in cleaning operations.

E. Clean exposed masonry surfaces of all stains, efflorescence, mortar or grout droppings, and debris.

F. Where new masonry wall surfaces remain stained or defaced by mortar or any other foreign matter to a degree not acceptable to the Owner, clean surfaces by a light sandblasting at no added cost. Avoid damaging masonry surfaces and joints during sandblasting operations.

3.19 PROTECTION OF FINISHED WORK

A. Without damaging completed work, provide protective boards at exposed external corners that may be damaged by construction activities.

B. Water Repellent Coating:

1. Apply sufficient coats of the approved material to achieve a consistent and uniform appearance, free from runs and sags, and with a uniformly resistive surface that will prevent penetration of water through the walls for the required period of warranty.
2. Twenty days after completion of the portion of the Work, and as a condition of its acceptance, demonstrate by running a water test showing it will successfully repel water.

    a. Notify the Engineer at least 72 hours in advance and conduct the test in the Engineer's presence.
    b. By means of an outrigger or similar acceptable equipment, place the nozzle of a 3/4" garden hose at a point approximately 10 feet away from the top of the wall, aiming the nozzle at a slight downward angle to direct the full stream of water onto the wall.
    c. Run the water onto the wall at full available force for not less than 4 hours.
    d. Upon completion of the 4-hour period, inspect the interior surfaces of the wall for evidence of moisture penetration.

3. If evidence of moisture penetration is discovered, apply an additional coat of the water repellent material to the exterior surface in areas directed by the Engineer, repeating the application and the testing, at no additional cost to the Owner, until no evidence of moisture penetration is found.

END OF SECTION 04 22 00

SECTION 05 12 23
STRUCTURAL STEEL

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Fabrication and erection of structural steel work, as shown on the drawings and specified herein. Work shall include, but not be limited to the following items:

1. Structural steel.
2. Base and bearing plates.
3. Deck support angles and framing for roof openings.
4. Steel lintel members for masonry openings.
5. Edge angles and bent plates.
6. Connection plates.
7. Shear stud connectors.
8. All other steel items as listed in AISC - "Code of Standard Practice for Steel Buildings and Bridges" as shown on structural and architectural drawings.

B. Work shall also include grouting of all structural steel members where indicated.

C. Structural notes indicated on the drawings regarding structural steel framing should be considered a part of this specification.

1.02 RELATED WORK

A. Pertinent Sections of Division 01.

B. Section 03 30 00 - Cast-in-Place Concrete.

C. Section 05 21 00 - Steel Joists.

D. Section 05 31 00 - Steel Deck.

E. Section 05 40 00 - Cold-Formed Steel Framing Systems.

1.03 REFERENCES

A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards except where more stringent requirements are shown or specified. Where any provisions of other pertinent codes and standards conflict with this specification, the more stringent provision shall govern.

1. AISC - Specification for Structural Joints Using ASTM A325 or A490 Bolts.
2. AISC - Specification for Structural Joints Using High-Strength Bolts.
3. AISC 303 - Code of Standard Practice for Buildings and Bridges.
4. AISC 341-16 - Seismic Provisions for Structural Steel Buildings, including any Supplements.
5. AISC 358-16 - Prequalified Connections for Special and Intermediate Steel Moment Frames for Seismic Applications.
6. AISC 360-16 - Specification for Structural Steel Buildings.

7. ASTM A6 - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling.
8. ASTM A36 - Standard Specification for Carbon Structural Steel.
9. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
10. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.
11. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
12. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
13. ASTM A193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.
14. ASTM A449 - Standard Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use.
15. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
16. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts.
17. ASTM A572 - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
18. ASTM A913 - Standard Specification for High-Strength Low-Alloy Steel Shapes of Structural Quality, Produced by Quenching and Self-Tempering Process (QST).
19. ASTM A992 - Standard Specification for Steel for Structural Steel Shapes.
20. ASTM A1085 - Standard Specification for Cold-Formed Welded Carbon Steel Hollow Structural Sections (HSS).
21. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
22. ASTM E94 - Standard Guide to Radiographic Examination Using Industrial Radiographic Film.
23. ASTM E165 - Standard Practice for Liquid Penetrant Examination for General Industry.
24. ASTM E709 - Standard Guide for Magnetic Particle Testing.
25. ASTM F436 - Standard Specification for Hardened Steel Washers.
26. ASTM F959 - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners.
27. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
28. ASTM F3125 - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi and 150 ksi Minimum Tensile Strength, Inch Dimensions.
29. AWS D1.1 - Structural Welding Code - Steel.
30. SSPC - Steel Structures Painting Council.

1.04 QUALITY ASSURANCE

A. Fabrication, Erection, and Welding Qualifications:

1. Fabricate structural steel members in accordance with AISC Specification for the design, fabrication, and erection of structural steel for buildings.
2. Steel fabricator shall not have less than five (5) years of continuous experience in fabrication of structural steel framing.
3. Steel detailer shall have five (5) years of continuous experience in the production of steel fabrication drawings.
4. Steel erector shall not have less than five (5) years of continuous experience in the erection of structural steel framing.
5. All welding of structural steel shall be performed by operators who have been recently qualified as prescribed in "Qualification Procedures" of the American Welding Society (AWS).

6. Information provided on paper-based contract documents will govern over information provided via electronic model transfer.
7. Tolerances: Tolerances shall be as indicated by the AISC Code of Standard Practice for Buildings and Bridges, except that tolerances for fabricating, rolling, cambering and erection shall not be cumulative.

1.05 SUBMITTALS

A. Shop Drawings:

1. Prepare and submit complete erection and detailed shop drawings for Engineer's approval, including framing plans indicating size, weight, and location of all structural members. Shop drawings shall indicate methods of connecting, anchoring, fastening, bracing, and attaching work of other trades.

    a. Where contract documents indicate verify in field (VIF) dimensions, shop drawings shall indicate these dimensions and Contractor shall note the dimensions have been verified.
    b. This specification modifies AISC Code of Standard Practice by deleting the following sentence from 4.4.1(c): "Release by the Owner's Designated Representatives for Design and Construction for the Fabricator to begin fabrication using the approved submittals." Review of the shop drawings by the Engineer shall not relieve the fabricator of this responsibility.

2. Furnish both the Engineer and Architect with one copy of the following:

    a. Final shop drawings containing all review notations.
    b. Field Use/For Construction drawings.

3. The steel fabricator shall submit a setting plan for all embedded items for Engineer's approval.
4. Welder's Certification: Submit certification for all welders employed on the project demonstrating they have been AWS qualified to perform the welding procedures required for this project.
5. General Contractor/Construction Manager to provide copies of field concrete cylinder breaks indicating the concrete meets 75% of the design compressive strength to the steel erector.

B. The General Contractor/Construction Manager shall conduct a field survey of as-built anchors and bearing plate locations and elevations prior to steel erection. Survey shall be furnished to the steel fabricator. Contractor shall identify deviations from approved shop drawings and submit proposed repairs and modifications to the Engineer and steel fabricator for approval.

C. Product Data:

1. Certified copies of material test reports, commonly called mill test reports, for all structural steel used on the project. Material test reports shall comply with the requirements of ASTM A6, shall cover chemical and physical properties, and shall be accompanied by a Certificate of Compliance from the fabricator.
2. Manufacturer specifications, certifications, and installation recommendations for the following products, including laboratory test reports and other data required to prove compliance with these specifications:

    a. High strength bolts, including nuts and washers.
    b. Unfinished bolts and nuts

3. The Contractor shall submit written procedures for the pre-installation testing, installation, snugging, pretensioning, and post-installation inspection of fasteners. The procedure(s) shall meet all requirements of the RCSC specification and the drawings. Procedures need to be submitted only for the method(s) of installation to be used by the Contractor, which may include the turn-of-nut, calibrated wrench, twist-off type tension control bolt, and direct tension indicator methods.
4. Shear Stud Connectors: Contractor shall submit the following:

    a. Certifications that the studs, as supplied, meet the requirements of AWS D1.1, Sections 7.2 and 7.3.
    b. Certified copies of the stud manufacturer's test reports covering the last completed set of in-plant quality control mechanical tests for the diameter supplied.
    c. Certified material test reports from the steel supplier indicating diameter, chemical properties, and grade on each heat number supplied.
    d. Certificate of Compliance from the Contractor.

5. Prepare and submit product data for Engineer's approval for shop applied primers, finished paint system, expansion and/or adhesive anchors, non-shrink grout other miscellaneous materials.

1.06 DELIVERY, STORAGE AND HANDLING

A. Steel members shall be transported, stored, and erected in a manner that will avoid any damage or deformation. Materials should be stored to allow easy access for inspection and identification. Bent or deformed members will be rejected and shall be replaced or repaired at the expense of the responsible party. Store clear of the ground and in such a manner as to eliminate excessive handling.

B. Store fasteners in a protected location. Clean and re-lubricate bolts and nuts before use.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Structural Steel:

1. All structural steel shall be free from defects impairing strength, durability, or appearance. All structural steel shall meet the latest minimum requirements as follows:

    a. Structural steel wide flange shapes shall:

        1) Conform to the ASTM designations listed in the General Notes of the drawings, unless noted otherwise.

    b. Structural steel angles, channels, bars, plates and miscellaneous steel shall conform to the ASTM designations listed in the General Notes of the drawings.
    c. Square and rectangular structural tubing shall be cold formed conforming to the ASTM designations listed in the General Notes of the drawings.
    d. Round structural tubing shall be cold formed conforming to the ASTM designations listed in the General Notes of the drawings.
    e. Steel pipe shall conform to the ASTM designations listed in the General Notes of the drawings.

B. High Strength Structural Bolts:

1. High strength structural bolts shall conform to the ASTM designations listed in the General Notes of the drawings.
2. High strength bolts shall be detailed and installed in accordance with AISC - "Specification for Structural Joints Using High-Strength Bolts."
3. Manufacturer's symbol and grade markings shall appear on all bolts and nuts.

C. Anchoring Devices:

1. Anchor Rods: Anchor rods used with structural steel members shall be plain threaded rods conforming to the ASTM designations listed in the General Notes of the drawings.
2. Expansion Anchors: Expansion anchors shall consist of one-piece wedge type carbon steel anchors with heavy-duty nuts and washers. All components shall be zinc plated in accordance with ASTM B633. Refer to the drawing details and General Notes for the expansion anchors used as the basis of design and the acceptable alternates.
3. Adhesive Anchoring System: Adhesive anchoring system shall consist of a threaded anchor rod complete with nut and washer and the adhesive cartridge. Refer to the drawing details and General Notes for the adhesive anchoring systems used as the basis of design and the acceptable alternates.

    a. Nuts shall meet ASTM A563, Grade DH, and washers shall meet ASTM F436.
    b. All components shall be zinc plated in accordance with ASTM B633 SC1.
    c. Adhesive shall consist of a two-part acrylic based adhesive applied in a dual cartridge dispensing system that properly mixes the components at the point of application.

D. Welding Materials:

1. Type required for material being welded in conformance with AWS D1.1.

E. Steel Stud Connectors:

1. For threaded studs that are being used to connect steel beams to embed plates, use ASTM A108, Type A, Grades 1010 through 1020 forged steel, headed uncoated with a minimum tensile strength of 61,000 psi. Fabricated within the tolerances set forth in AWS D1.1.
2. For shear connectors that are being used on steel beams in concrete slabs for composite shear transfer and embedded steel members, use ASTM A108, Type B, Grades 1010 through 1020 forged steel, headed uncoated with a minimum tensile strength of 65,000 psi. Fabricated within the tolerances set forth in AWS D1.1
3. Studs applied by means of the electric arc welding process and shall use an arc shield ferrules of heat resistant ceramic.

F. Galvanizing: Where indicated on the drawings, steel shall be galvanized by the hot-dip process after fabrication conforming to ASTM A123. All exterior steel that will remain exposed shall be galvanized, unless otherwise indicated.

G. Paints and Primers:

1. Fabricator's standard lead- and chromate-free, non-asphaltic, rust-inhibiting primer.

H. Non-Shrink Grout for Base and Bearing Plates: Non-shrink grout, conforming to ASTM C1107, shall be pre-mixed, non-metallic, non-corrosive, non-staining product containing selected silica sand, Portland cement, shrinkage compensating agents, plasticizing and water reducing agents. All constituents shall meet the requirements of these specifications. Minimum compressive strength at 28-days shall be 7,000 psi as determined by ASTM C109. Follow manufacturer's instructions for handling, mixing, placing, and curing. Acceptable products are:

1. Euclid Chemical Company - Euco N.S. Grout
2. L&M Construction Chemical - Crystex.
3. Master Builders - Masterflow 713.
4. Sonneborn - Sonnogrout.
5. Five Star Products Inc. - Five Star Grout.
6. Dayton Superior - Sure-Grip High Performance Grout.
7. Dayton Superior - 1107 Advantage Grout.

2.02 FABRICATION AND MANUFACTURE

A. Fabrication Procedures (non-AESS):

1. Fabricate all structural steel items in accordance with AISC Specifications and as indicated on the approved shop drawings.
2. Provide camber in structural members where indicated.
3. Properly mark materials for field assembly and location for which intended. Fabricate for delivery sequence that will expedite erection and minimize handling of materials.
4. Complete structural steel assemblies before shop priming or galvanizing.

B. Architecturally Exposed Structural Steel (AESS):

1. Prepare AESS surfaces according to Table 10.1 in the AISC Steel Design Manual, unless noted otherwise.

    a. Fabrication and erection tolerances, which are more stringent than required by the AISC Code of Standard Practice for Buildings and Bridges.

        1) Curved Members: Distortion of webs, stems, outstanding flanges, and legs of angles shall not be visible from a distance of 20 feet under any lighting conditions.
        2) Tolerance for walls of curved hollow steel sections after rolling shall be approximately 1/2-inch.

    b. Welded Connections: Comply with AWS D1.1, AWD D1.8 and Section 05 05 23.

        1) Remove backing bars or run-off tabs; back-gouge and grind steel smooth.
        2) Remove erection bolts, fill holes, and grind smooth.
        3) Fill weld access holes and grind smooth.

    c. Requirements, if any, of a mockup of components for inspection and acceptance of standards prior to the start of fabrication.
    d. Special handling and touch-up requirements.

C. Shop Connections:

1. All shop connections shall be welded, unless noted otherwise on drawings. Connections shall develop the full strength of the adjoining members unless detailed otherwise.

2. All holes shall be either drilled or punched, as no burning of holes will be permitted, including the enlargement of holes. Provide all holes required for connections and for attaching the work of other trades where such holes are shown if furnished prior to fabrication.
3. Connections shall be detailed as standard framed beam connections (bearing type) in accordance with the AISC Manual of Steel Construction. Connections which require oversized holes or slotted holes in which the force is other than normal to the axis of the slot shall be detailed as "Slip-Critical Connections" and noted as such on the erection drawings. Provide bearing plates and end anchorage for beams resting on masonry.

D. Steel Stud Connectors:

1. Steel stud shear connectors shall be securely welded in the field to structural steel beams as detailed on the drawings. Welds shall be such that the stud connector will deform before weld failure occurs. Welding shall be done in accordance with AWS D1.1.
2. Steel stud connectors for embedded plates and angles shall be welded in the fabrication shop in accordance with AWS D1.1.

E. Deck support framing and seats: Furnish all miscellaneous framing necessary to fully support the roof and floor steel decking.

F. Shop Priming:

1. Unless noted otherwise below, structural steel shall not be shop primed.
2. If the steel pieces are to be shop primed, the following surfaces are exceptions to shop priming:

    a. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
    b. Surfaces to be field welded.
    c. Surfaces to be high-strength bolted with slip-critical connections.
    d. Top flanges of beams supporting composite steel decking.
    e. Surfaces to receive sprayed fire-resistive materials.
    f. Galvanized surfaces.

3. Surface Preparation: Clean Surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
4. Priming: Apply primer in accordance with paint manufacturer's recommendations, and at a rate recommended by SSPC to provide a dry film thickness of not less than 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

G. Galvanizing:

1. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A123.

    a. Fill vent holes and grind smooth after galvanizing.
    b. Unless otherwise noted on drawings or in Division 9, all exterior steel components exposed to the elements shall be galvanized, including, but not limited to, lintels.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

A. Examine the areas 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 have been corrected.

3.02 ERECTION

A. Erection Procedures:

1. The erector and not the Structural Engineer shall be responsible for the means, methods, and safety of erection of the structural steel framing.
2. Erection of all structural steel items shall meet the requirements of AISC "Specification and Code of Standard Practice."
3. All work shall be erected square, plumb, straight and true, accurately fitted and with tight joints and intersections, by mechanics experienced in the erection of structural steel. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
4. Clean the bearing surface and other surfaces that will be in permanent contact before assembly.
5. All base plates shall be supported on steel wedges, steel shims or heavy-duty leveling nuts until the supported members have been leveled and plumbed.

    a. Snug tighten anchor rods after supported members have been positioned and plumb. Do not remove wedges or shims but, if protruding, cut off flush with edge of base plate before packing with grout.
    b. Promptly place non-shrink grout between bearing surfaces and base plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturers written installation instructions for shrinkage-resistant grouts.

6. Field connections of structural work shall be made with either high strength bolts (bearing type) or by welding. Proper precaution shall be taken to ensure anchored items will not be distorted or overstressed due to improperly fabricated items.
7. Splice members only where indicated unless, with the Structural Engineer's approval, splices not indicated would result in lower costs due to reduced shipping expense. For splices not indicated, submit structural calculations prepared under direct supervision of and signed by a Structural Engineer licensed in the state where the project is located.
8. Do not use thermal cutting during erection unless approved by the Engineer/Architect in writing.
9. Steel erection shall not proceed without concrete in footings, piers, and walls attaining 75% of the intended minimum compressive design strength. Documentation must be provided indicating compliance with this requirement.

B. Surveys:

1. Establish permanent benchmarks necessary for accurate erection of structural steel.
2. Check elevations of concrete surfaces, and locations of anchor bolts and similar items, before erection proceeds.

C. Bracing and Protection:

1. Steel shall be well plumbed, leveled and braced to prevent any movement.

a. Contractor shall provide and maintain all necessary temporary guying of steel frame to safely resist all wind and construction loads during erection and to assure proper alignment of all parts of the steel frame.

2. Provide all temporary flooring, bracing, shoring and guards necessary to prevent damage or injury. All partially erected steel shall be secured in an approved manner during interruptions of work.

D. Anchor and Foundation Rods:

1. All anchor or foundation rods and similar steel items to be built into concrete or masonry are to be set by the concrete or masonry contractors and shall be furnished promptly so they may be built in as the work progresses because cutting of structural steel members to accommodate errors pertaining to embedded items will not be permitted.

3.03 FIELD WELDING

A. Welding Procedures:

1. All field welding shall be in accordance with AISC Specifications and conform to AWS D1.1 "Structural Welding Code - Steel".

a. Comply with AISC's "Code of Standard Practice for Steel Buildings and Bridges" for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
b. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances of AISC's "Code of Standard Practice" for Steel Buildings and Bridges" for mill material.

2. Contractor shall remove ceramic ferrules from shear stud connectors in sufficient time to allow for inspection of welds prior to placement of the concrete.

3.04 REPAIRS, PROTECTION, AND TOUCH UP

A. Repair damaged galvanized coatings and on galvanized items with galvanized repair paint according to ASTM A780 and manufacturer's written instructions.

B. Touch up Painting: After installation, promptly clean, prepare, and prime or reprime field welds, final connections, rust spots, and abraded surfaces of prime-painted joists, bearing plates and abutting structural steel.

1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
2. Apply a compatible primer of the same type as shop primer used on adjacent surfaces.
3. Secure approval by the Architect prior to field painting.

3.05 GROUTING

A. Grouting under structural framing members shall be completed after all members have been plumbed and braced and before imposed loads are placed thereon.

B. Remove all defective concrete, dirt, oil, grease, and other foreign matter from surfaces to which grout will be placed.

3.06 MISCELLANEOUS STEEL AND STEEL LINTELS

A. Furnish and install all miscellaneous steel as detailed in architectural and structural drawings.

B. The steel fabricator shall furnish all steel lintels required for masonry wall construction indicated in the architectural and structural drawings and schedules.

C. Provide additional steel framing for continuous support of steel deck edges at openings and column interruptions.

D. All exterior exposed steel shall be hot-dip galvanized in accordance with ASTM A123.

END OF SECTION 05 12 23

SECTION 05 21 00
STEEL JOISTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Fabrication and erection of open web steel joists. Work shall include but not be limited to, the following items:

1. K-series joists.
2. LH-series joists.
3. Bridging.
4. Joist anchors and connections.

B. Structural notes indicated on the drawings regarding steel joists shall be considered a part of this specification.

1.02 RELATED WORK

A. Pertinent Sections of Division 01.

B. Section 03 30 00 - Cast-in-Place Concrete.

C. Section 03 41 00 - Structural Precast Concrete.

D. Section 04 22 00 - Reinforced Unit Masonry.

E. Section 05 12 23 - Structural Steel.

F. Section 05 31 00 - Steel Deck.

1.03 REFERENCES

A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified. Where any provisions of other pertinent codes and standards conflict with this specification, the more stringent provision shall govern.

1. AISC 303 - Code of Standard Practice for Buildings and Bridges.
2. AISC 360-16- Specification for Structural Steel Buildings.
3. ASTM A36 - Standard Specification for Carbon Structural Steel.
4. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.
5. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
6. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength.
7. ASTM A572 - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
8. ASTM F3125 - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi and 150 ksi Minimum Tensile Strength, Inch Dimensions.
9. AWS D1.1 - Structural Welding Code.

10. SJI 100 - Standard Specification for K-Series, LH-Series, and DLH-Series Open Web Steel Joists and for Joist Girders.
11. SSPC - Steel Structures Painting Council.

1.04 QUALITY ASSURANCE

A. Manufacturer: Company specializing in performing the work of this section with minimum ten (10) years documented experience. Fabrication company shall be certified by the Steel Joist Institute (SJI) to manufacture joists complying with the SJI Standard Specifications and Load Tables.

B. Manufacturer shall assume responsibility for engineering special joists indicated on the drawings to comply with the SJI standard specification performance requirements. This responsibility includes the preparation of shop drawings and comprehensive engineering analysis by a qualified Structural Engineer licensed in the State where the project is located.

C. Erector: Company specializing in performing the work of this section with minimum five (5) years documented experience.

1.05 SUBMITTALS

A. Prepare and submit shop and erection drawings for Engineer's approval.

B. Shop drawings:

1. Indicate standard designations, configuration, sizes, spacing, location of joists, and joist chord extensions.
2. Joining and anchorage details of attachment to other construction.
3. Size, location, and configuration of all code required bridging, bracing and connections.
4. Joist cambers.
5. Type of paint and shop primer.
6. Dimensions verifying that field measurements are as shown on the drawings.

C. Welder's Certificates: Submit certification for all welders employed on the project demonstrating they have been AWS qualified to perform the welding procedures required for this project.

1.06 DELIVERY, STORAGE AND HANDLING

A. All joists and accessories shall be transported, stored, and erected in a manner, which will prevent any damage or deformation. Damaged joists shall not be erected or repaired without Structural Engineer's approval. Joists shall be stored clear of the ground in such a manner so as to eliminate excessive handling and protect from weather with a weatherproof covering.

B. Deliver and store all joists and accessories to the site according to all SJI requirements.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Bar Joists: Steel used in the manufacture of bar joists shall be as allowed by the Steel Joist Institute (SJI) standard specification for chord and web members.

B. High Strength Bolts and Nuts: ASTM F3125, Grade A325, Type 1 heavy hex steel structural bolts, heavy hex carbon steel nuts, and hardened carbon steel washers. Finish shall be plain, uncoated.

C. Miscellaneous items, such as bridging, headers, bolts, nuts, washers, anchors, and all other appurtenances for a complete steel joist installation shall be furnished as a part of the work of this section.

D. Primer: Provide the manufacturer's standard shop primer with good resistance to normal atmospheric corrosion and complying with the performance requirements specified in the SJI "Standard Specification" previously cited.

1. Do not prime paint joists and accessories scheduled to receive spray applied fireproofing.
2. Contractor shall certify compatibility of shop primer coat with field applied paint finishes.

E. Welding Materials: AWS D1.1; type required for materials being welded.

2.02 FABRICATION AND MANUFACTURE

A. Manufacture K-Series steel joists according to "Standard Specification for Open Web Steel Joists, K-Series," in SJI "Specifications," with steel angle top and bottom chord members, underslung ends, and parallel top chords; of joist type indicated.

B. Manufacture long span steel joists according to "Standard Specifications for Longspan Steel Joists, LH-Series and Deep Longspan Steel Joists, DLH-Series," in SJI's "Specifications," with steel angle top and bottom chord members; of joist type and end and top chord arrangements as indicated on the drawings.

C. All steel joists shall consist of an electrically welded open-web type, designed, and fabricated to conform to the "Standard Specifications" included in the SJI or AISC publications cited above and shall be manufactured by a current member of the Steel Joist Institute.

D. Provide holes in chord members for connecting and securing other construction to joists. General Contractor shall coordinate this information and provide the manufacturer with drawings outlining the location of any required holes.

E. Bridging members for open web joists, unless otherwise indicated on the drawings, shall be continuous wall to wall, complete with suitable anchorage at each end, all in accordance with SJI "Standard Specifications".

F. Design and fabricate joists and bridging to support a minimum net uplift as indicated on the drawings. A 1/3 stress increase shall not be used in uplift design.

G. Camber joists in accordance with SJI Standard Specification.

H. All steel joists including all accessories, before leaving the shop shall be thoroughly cleaned of all mill scale, rust and foreign matter and shall be given one (1) coat of primer complying with the performance requirements specified in the SJI "Standard Specification" previously cited.

PART 3 - EXECUTION

3.01 ERECTION

A. Erection of all steel joist items shall meet the applicable requirements of the SJI "Standard Specifications" previously cited.

B. All anchor bolts, wall anchors, bridging anchors, bearing plates and similar items to be built into concrete or masonry are to be set by the concrete or masonry contractors and shall be furnished promptly so they may be built-in as the work progresses as no cutting for the same afterward will be permitted. Beginning of installation means erector accepts existing conditions.

C. All steel joists shall be accurately set to the lines, elevations and dimensions indicated on the approved shop drawings.

D. Bridging shall be installed concurrently with joist erection and before loads are applied. Bridging shall be securely welded to joist chords in a manner that will not damage joist members and so as to ensure positive resistance to both tensile and compressive stresses. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

E. All joists bearing on concrete or masonry shall bear on a steel bearing plate and joists bearing on steel shall be welded to the supporting steel.

F. All field welding shall be in accordance with AWS previously cited.

G. All construction loads shall be kept off joists until they are permanently anchored and bridged. During construction, care shall be taken to avoid excessive concentrated or moving loads. Provide for adequate distribution of any such loads so the carrying capacity of the joists is not exceeded.

H. Joist shall not be positioned any greater than 1/4 inch from true alignment and shall not vary more than 1/4 inch from plumb.

3.02 FIELD TOUCH UP

A. Immediately after erection, Contractor shall touch up all erection bolts, all field welds and all scratched or abraded areas and paint out erection markings with matching rust-inhibitive primer in color and formulation to match shop primer.

END OF SECTION 05 21 00

SECTION 05 31 00
STEEL DECK

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Fabrication and erection of steel deck. The Work shall include, but not be limited to the following:

1. Roof deck, roof deck accessories, and roof deck fasteners.
2. Acoustical roof deck, acoustical insulation component and accessories.
3. Composite floor deck.
4. Shear studs.

B. Structural notes indicated on the drawings regarding steel decking shall be considered a part of this specification.

1.02 RELATED WORK

A. Pertinent Sections of Division 01.

B. Section 03 30 00 - Cast-in-Place Concrete.

C. Section 05 12 23 - Structural Steel.

1.03 REFERENCES

A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified. Where any provisions of other pertinent codes and standards conflict with this specification, the more stringent provision shall govern.

1. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members.
2. ASCE 9 - Standard for the Structural Design of Composite Slabs and Standard Practice for Construction and Inspection of Composite Slabs.
3. ASTM A36 - Standard Specification for Carbon Structural Steel.
4. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.
5. ASTM A653 - Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
6. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
7. ASTM A1008 - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
8. AWS D1.1 - Structural Welding Code - Steel.
9. AWS D1.3 - Structural Welding Code - Sheet Steel.
10. SDI Roof Deck Design Manual.
11. SDI Floor Deck Design Manual.
12. SDI Diaphragm Design Manual.

1.04 QUALITY ASSURANCE

A. Fabricator: Company specializing in performing the work of this section with minimum five (5) years documented experience at manufacturing steel deck. Fabrication Company shall be a current member of the Steel Deck Institute (SDI).

B. Erector: Company specializing in performing the work of this section with minimum five (5) years documented experience at erecting steel deck.

C. Welding: Qualify Welding Procedure Specifications (WPS) and welding operator in accordance with AWS D1.3. Provide certifications that welders to be employed in the construction have satisfactorily passed AWS qualifications tests. If recertification of welders is required, retesting will be the contractor's responsibility.

D. Contractor to verify the manufacturer's steel deck type selected is listed on the UL fire rated roof assembly specified by the Architect for this project.

E. Furnish and install steel deck in accordance with the manufacturer's current ICC Research Committee Report to obtain diaphragm values indicated.

1.05 SUBMITTALS

A. Prepare and submit shop drawings for Engineer's approval. Shop drawings shall indicate deck layout, depth, uncoated metal thickness, framing and supports with unit dimensions and sections, shear stud layout and complete end jointing. Contractor to verify measurements, lines, elevations, and details of field conditions to conform with actual conditions.

1. Provide details of all accessories.
2. Shop drawings shall also indicate typical welding or mechanical anchoring pattern for steel deck and accessories.

B. Prepare and submit allowable construction span tables and allowable total load tables for Engineer's approval. Tables shall be accompanied with a letter of certification from the manufacturer stating the tabulated design values were determined in accordance with the Steel Deck Institute's Design Manuals for Roof Deck, Floor Deck and Diaphragm Design.

1. The gauges and section moduli indicated on the drawings or specified herein are minimum and the gauge and section modulus of the deck furnished shall meet or exceed these minimum requirements. All gauges are United States standard, measured prior to coating.

C. WPS and Procedure Qualification Records (PQR) shall be current and approved by the Structural Engineer and HCAI.

D. Provide manufacturer's latest recommendations and installation instructions.

E. Prepare and submit product data of proposed materials.

1.06 DELIVERY, STORAGE AND HANDLING

A. All decking materials shall be transported, stored, and erected in a manner that will prevent damage or deformation of sheets. Damaged material shall not be erected or repaired without Structural Engineer's approval.

B. Deck panels shall be stored clear of the ground, elevated on one end, and protected from weather with waterproof covering.

1.07 COORDINATION

A. Coordinate the installation of the sound-absorbing insulation strips in the topside ribs of the acoustical deck with roof installation specified in Division 7 to ensure protection of insulation strips against damage from the effects of weather and other elements.

PART 2 - PRODUCTS

2.01 STEEL ROOF DECK

A. Fabricate panels to comply with the "SDI Roof Deck Design Manual," and the following:

1. Steel decking sheet material, minimum yield strength, depth, gauge, profile, and finish are indicated on the drawings, as classified by the Steel Deck Institute (SDI). Panels shall be formed with integral ribs and overlapping side flanges.

2.02 ACOUSTICAL STEEL ROOF DECK

A. Acoustical Steel Roof Deck: Fabricate panels to complete with the "SDI Roof Desk Design Manual," and the following:

1. Steel decking sheet material, minimum yield strength, depth, gauge, profile, and finish are indicated on the drawings, as classified by the Steel Deck Institute (SDI). Panels shall be formed with integral ribs and overlapping side flanges.
2. Acoustical Perforations: Deck units with manufacturer's standard perforated vertical webs.
3. Sound Absorbing Insulation: Provide the deck manufacturer's standard premolded roll or strip glass fiber or mineral fiber insulation. Provide continuous wire mesh deck/insulation spacers for field painted decking.
4. Acoustical Performance: NRC = 0.65.

2.03 COMPOSITE STEEL FLOOR DECK

A. Composite Steel Floor Deck: Fabricate panels with integrally embossed or raised pattern ribs to comply with the "SDI Floor Deck Design Manual," and the following:

1. Steel decking sheet material, minimum yield strength, depth, gauge, profile, and finish are indicated on the drawings, as classified by the Steel Deck Institute (SDI). Panels shall be formed with integral ribs and overlapping side flanges.

2.04 FASTENERS

A. Support Fasteners:

1. Welded: Refer to the drawings for weld size and spacing requirements.

    a. Welding rods shall comply with all applicable requirements of the AWS Codes.

b. Shear studs may replace support fasteners. Refer to the drawings for requirements.

1) Provide headed stud type of cold finished carbon steel per Section 05 12 23.
2) Use ferrules suitable for use with galvanized steel deck.

c. Weld washers are required for material less than 0.028" thick. Weld washers shall be a minimum thickness of 0.0598" and be applicable to AWS D1.3 type welding and of type as recommended by the deck manufacturer.
d. Weld metal shall penetrate all layers of deck material and shall have good fusion to the supporting steel. Fasten ribbed deck to steel support members at ends and intermediate supports.

1) All welding shall be in conformance with previously cited AWS recommendations in appearance and quality of welds, and the methods used in correcting welding work.

B. Side Lap Fasteners:

1. Mechanical: Zinc coated self-drilling, self-tapping type (minimum No. 10) steel screws. Refer to the drawings for fastener spacing requirements.

2.05 ACCESSORIES

A. Steel materials to conform to ASTM A1008 meeting the requirements of ASTM A653, G60 coating.

B. Provide all closers, fillers, starters, sump pans, metal cant strips, ridge and valley plates, pour stops, column closures, girder fillers, and similar accessories required for a complete installation. Provide cover plates at all locations where direction of deck span changes. Unless otherwise noted, accessories shall be of the same steel sheet material, finish, and thickness as the deck sections.

PART 3 - EXECUTION

3.01 ERECTION

A. Verify field conditions are acceptable and are ready to receive work. Correct inaccuracies in alignment or level before deck units are finally placed.

B. Deck units and deck accessories herein specified shall be thoroughly and securely erected by experienced workmen fastening to supporting steel members specified. All work shall be in conformance with the manufacturer's latest printed recommendations and approved shop drawings.

C. Beginning of installation means installer accepts existing conditions.

D. The finished work shall be true, flat planes and to slopes indicated with end joints flush and without sharp protruding edges. Exposed underside of deck shall be true without defect.

E. Where large predetermined openings for elevators, stairs, ducts, and similar elements passing through the deck units occur, furnish prefabricated units to fit job conditions. Where other holes or openings are required in decking after erection, reinforce such holes as indicated on the drawings. Cantilever deck to the edge of slabs only as indicated on the drawings.

F. Burning of holes in decking will not be permitted.

G. Steel decking shall be installed to span supporting steel members at right angles. Panels shall be securely anchored to each structural support it rests on or passes.

3.02 ROOF DECK

A. Fasten roof deck panels to steel supporting members as specified on the drawings.

B. Deck shall be fastened through the bottom of the deck rib to all structural supports for the specific deck sections.

C. Install sound absorbing insulation into the topside ribs of the acoustical deck as specified in the deck manufacturer's installation instructions. Coordinate with the roofing installation to protect the insulation from damage.

D. Place deck panels on structural supports and adjust to final position with ends aligned. Attach to supports immediately after placement.

E. Roof sump pans shall be installed over openings provided in roof deck with flanges welded to the top of the deck. Space welds at 12 inches apart with at least 1 weld in each corner.

F. Install all roof deck accessories in accordance with the roof deck manufacturer's written instructions.

3.03 FLOOR DECK

A. Fasten floor deck panels to supporting steel as specified on the drawings.

B. Unless noted otherwise, secure side laps and perimeter edges of units with fasteners at mid-span between supports or 36 inches on center, whichever distance is smaller.

C. Place deck panels on structural supports and adjust to final position with ends aligned. Attach to supports immediately after placement.

D. Install pour stops and girder fillers to supporting structure according to manufacturer's recommendations.

E. Fasten column closures and cell closures to deck to provide a tight fit. Provide cell closures at changes in direction of deck units, unless otherwise noted.

F. Install all floor deck accessories in accordance with the floor deck manufacturer's written instructions.

G. If steel stud shear connectors are being applied through the deck onto the structural steel for composite floor construction, the stud welds can be used to replace the specified puddle welds.

H. Composite deck sheets with steel shear stud connectors shall be butted over supporting members. Standard tolerance for ordered lengths is plus or minus 1/2 inch.

I. Steel studs connectors shall be installed only by certified operators who are thoroughly familiar with the installation equipment.

J. Steel stud connectors shall have complete fusion to the steel beams underlying the decking. Where repairs are made by fillet welding, such welding shall be between stud and beam, with removal of portions of the decking as required.

K. Where the decking is thick due to heavy gauge sheets or double sheets at cellular panels, holes in one or more sheets shall be made before stud welding when required to ensure fusion of steel stud connectors to beams. When such holes are not made, fusion shall be verified.

L. Ferrules shall be removed after completion.

3.04 FIELD TOUCH UP

A. After erection, all weld burn marks and abraded spots shall be cleaned and field painted with a rust-inhibiting metal primer matching formulations and color of shop coat or a zinc-rich rust inhibiting paint for galvanized deck surfaces.

END OF SECTION 05 31 00

SECTION 05 40 00
COLD-FORMED STEEL FRAMING (CFSF) SYSTEM

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Load bearing structural steel stud, framing system of 18 to 12-gauge (43 mil to 97 mil) members along with fasteners and related accessories. Furnish and install cold-form steel framing, as shown on the drawings and specified herein. Work shall include, but not be limited to the following items:

1. Bearing and non-load bearing formed steel stud exterior wall and interior bearing wall framing.
2. Provide tracks, blocking, lintels, clips angles, bridging, shoes, reinforcements, fasteners, and accessories to construct a complete steel framing system.

B. Structural notes indicated on the drawings regarding cold-formed steel framing system shall be considered a part of this Specification.

1.02 RELATED WORK

A. Pertinent Sections of Division 01.

B. Section 05 12 23 - Structural Steel.

C. Section 05 21 00 - Steel Joists.

D. Section 05 31 00 - Steel Deck.

1.03 REFERENCES

A. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified. Where any provisions of other pertinent codes and standards conflict with this specification, the more stringent provision shall govern.

1. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members.
2. AISI S200 - North American Standard for Cold-Formed Steel Framing - General Provisions.
3. AISI S202 - North American Standard for Cold-Formed Steel Structural Framing.
4. AISI S210 - North American Standard for Cold-Formed Steel Framing - Floor and Roof System Design.
5. AISI S211 - North American Standard for Cold-Formed Steel Framing - Wall Stud Design.
6. AISI S212 - North American Standard for Cold-Formed Steel Framing - Header Design.
7. AISI S213 - North American Standard for Cold-Formed Steel Framing - Lateral Design.
8. AISI S214 - North American Standard for Cold-Formed Steel Framing - Truss Design.
9. ASTM A653 - Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

10. ASTM A1008 - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
11. ASTM C955 - Standard Specification for Cold-Formed Steel Structural Framing Members.
12. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.
13. AWCI - Association of Wall and Ceiling Industries.
14. AWS D1.3 - Structural Welding Code - Sheet Steel.
15. SSMA - Steel Stud Manufacturers Association.

1.04 QUALITY ASSURANCE

A. Workmen Qualifications:

1. For the actual erection of cold-formed steel framing system, use only skilled journeymen steel framing erectors who are thoroughly experienced with the materials and methods specified.
2. Use qualified welders and comply with AWS standards.

B. Design Qualifications:

1. Engage a fabricator who uses a qualified Structural Engineer, licensed in the State where the trusses are to be installed, to prepare calculations, shop drawings and other structural data for the cold-formed steel framing system.

C. Manufacturer: Company specializing in performing the work of this section with a minimum of five (5) years documented experience at manufacturing cold-formed steel and framing systems and related accessories. Manufacturer shall be a current and "full" member of the Steel Stud Manufacturers Association (SSMA) or Steel Framing Industry Association (SFIA).

D. All cold-formed steel furnished under this section shall be supplied by a manufacturer who is a current member of the Steel Stud Manufacturers Association (SSMA) or Steel Framing Industry Association (SFIA).

E. Steel studs, headers, and other elements used for this project are sized based on SSMA. Elements of equal or greater capacity may be exchanged.

1.05 SYSTEM PERFORMANCE REQUIREMENTS

A. Structural Performance:

1. Provide cold-formed steel framing (CFSF) capable of withstanding design loads indicated on the plans.
2. Design CFSF to withstand design loads meeting the following deflection limits:

    a. Exterior walls backing up brick or stone veneer: Horizontal deflection of 1/600 of wall height.
    b. Exterior walls clad with metal siding, exterior insulated finish systems or other flexible non-brittle finishes: Horizontal deflection of 1/360 of wall height.
    c. Interior Load-Bearing Walls: Horizontal deflection of 1/360 of wall height under 5 psf load.

3. Design CFSF to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120F.
4. Design system to accommodate construction tolerances, deflection of building structural members (1-inch maximum), and clearances of intended openings.
5. CFSF shall be designed in accordance with all AISI Standards.

1.06 SUBMITTALS

A. Shop Drawings:

1. Prepare and submit complete erection and detailed shop drawings for Engineer's approval, including framing plans indicating size, gauge, weight, and location of all framing members. Shop drawings shall indicate the following:

   a. Component details, framed openings, bearing, anchorage, loading, welds, type and location of fasteners, bracing, bridging, strapping, connections, and accessories or items required of other related work. Provide stud, layout.
   b. Describe method for securing studs to tracks and for bolted/welded framing connections.
   c. Provide calculations for loadings and stresses of the steel framing system, including specially fabricated components and roof trusses, prepared by a registered Structural Engineer, with registration from the State in which the project is located.
   d. Detail size and location of all bridging, strapping, bracing, splices, and accessories required for installation.

B. Product Data:

1. Provide product data on standard framing members. Describe materials and finish, product criteria and limitations. Submit manufacturer's installation instructions.

1.07 DELIVERY, STORAGE AND HANDLING

A. Steel members shall be transported, stored, and erected in a manner that will avoid any damage or deformation. Bent or deformed members will be rejected and shall be replaced or repaired at the expense of the responsible party. Store clear of ground and in such a manner so as to eliminate excessive handling.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Framing Materials:

1. Studs shall conform to the ASTM designations listed in the General Notes of the drawings, unless noted otherwise, and be formed to channel shape, punched web, with nominal size as indicated on the drawings.
2. Track shall be minimum 18 gauge (43 mil) thick sheet steel, channel shaped, solid web, same width as studs. Track shall provide a tight fit for studs.

B. Accessories:

1. Bracing, furring, and bridging shall consist of formed sheet steel with thickness determined for conditions encountered. Provide manufacturer's standard shapes, complete with finish same as framing members.
2. Plates, gussets, and clips shall consist of formed sheet steel with thickness determined for conditions encountered. Provide manufacturer's standard shapes, complete with finish same as framing members.

C. Fasteners:

1. Self-drilling, self-tapping screws, bolts, nuts, and washers shall conform to ASTM A90, complete with hot-dip galvanized coating, minimum size: 1/4-14.
2. Expansion anchors shall be "Kwik" bolts, as manufactured by Hilti, Inc.
3. All other fasteners shall be as indicated on drawings or as recommended by the cold-form manufacturer.
4. Welding connections are to be performed in accordance with American Welding Society (AWS) D1.3 "Structural Welding Code - Sheet Steel." Consult AWS D19.0 latest edition "Welding Zinc Coated Sheet" and ANSI Standard Z49.1 for information regarding welding procedures.

D. Finishes:

1. Furnish all studs, with a factory galvanized (G60), finish.

2.02 FABRICATION

A. Fabricate assemblies of framed sections, of sizes and profiles required with framing members fitted, reinforced, and braced to suit design requirements.

B. Fit and assemble in largest practical sections for delivery to Worksite, ready for installation.

C. Bearing studs must be fabricated with full stud end seated against track web. Do not use studs that have been cut at punchouts.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify substrate surfaces and building framing components are ready to receive work.

B. Beginning of installation means acceptance of existing conditions and substrate.

3.02 INSTALLATION

A. General:

1. Cold-formed steel framing system shall consist of structural steel studs with locations as shown on the drawings. All work shall be in accordance with approved shop drawings and manufacturer's latest printed specifications. Framing members shall be securely attached by fusion welding with fillet, plug, butt, or seam type welds mechanical fasteners as indicated on the drawings and as recommended by the manufacturer.

a. All field welding shall be in accordance with AWS previously cited.
b. Wire tying of stud components will not be allowed.
c. Complete framing system ready to receive subsequent facing material.

2. Provision shall be made in the studs for rigid fastening of all blocking and special braces or framing and for attachment and support of electrical outlets or other equipment indicated to be supported by stud construction.

a. All anchorage, bracing and blocking shall be in accordance with approved shop drawings and as recommended by the manufacturer.

3. Surfaces abraded by handling, weld locations and other miscellaneous defects shall be touched-up with zinc-rich galvanizing compound (ZRC) coating.

B. Erection of Studding:

1. Top and bottom track members shall be the same size and gauge as the stud and be continuous for the total length of the framing system or as long as practical and shall be securely attached a maximum of 24 inches on center with approved fastening devices. Studs shall extend in one piece full height vertically between tracks, spaced no greater than 24 inches on center, with all web cut-outs in perfect alignment. Studs shall provide solid backing at corners and jambs. Install studs with all components properly aligned and braced with all work plumb and true, ready and acceptable to receive surface materials.

a. Coordinate installation of sealant with floor and ceiling tracks.
b. Field cutting of studs shall be done by sawing.
c. Splices in axially loaded studs will not be permitted.
d. Erect load bearing studs, brace and reinforce to develop full strength to meet design requirements.
e. Extend stud framing through ceiling to underside of floor or roof structure above.
f. Install intermediate studs above and below openings with studs equally spaced to correspond to adjacent stud spacing.
g. Provide deflection allowance in stud track, directly below horizontal building framing for non-load bearing framing.
h. Framing fabricator shall ensure punchout alignment when assembling framing and field cutting to length.
i. All framing components shall be cut squarely for attachment to perpendicular members.
j. In the event a track butt joint occurs within a panel, abutting pieces of track shall be butt welded or spliced together. No such splices shall occur at any head or sill condition.

2. Steel studs shall be located not more than 2 inches from all door, abutting partitions, partition corners and other construction. Unless detailed otherwise, track or stud member shall be used as a runner over door frames. Structural studs shall be securely and rigidly anchored in place to give total and complete support to subsequent materials attached thereto. All studs shall be securely attached to jamb and head anchor clips of each door frame by manufacturer's recommended method.

a. Construct corners using minimum three studs. Jamb studs at doors, windows, and other wall openings shall be designed to resist the tributary load of the opening and meet specified performance requirements.

b. Cold-rolled steel channel stiffeners or bridging shall be provided and installed horizontally every 60 inches in all framing systems through stud web cut-outs with clips welded in place at each stud.

END OF SECTION 05 40 00

SECTION 05 50 00
METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop fabricated steel items.
   1. Miscellaneous steel plates, angles and other shapes.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.

B. Section 03 41 00 - Precast Structural Concrete: Placement of metal fabrication in precast structural concrete.

C. Section 04 20 00 - Unit Masonry: Placement of metal fabrications in masonry.

D. Section 05 12 00 - Structural Steel Framing: Structural steel column anchor bolts.

E. Section 05 21 00 - Steel Joist Framing: Structural joist bearing plates, including anchorage.

F. Section 05 31 00 - Steel Decking: Bearing plates for metal deck bearing, including anchorage.

G. Section 05 40 00 - Cold-Formed Steel Framing (CFSF) System

H. Section 05 51 00 - Metal Stairs.

I. Section 05 52 13 - Pipe and Tube Railings.

J. Section 09 91 13 - Exterior Painting: Paint finish.

K. Section 09 91 23 - Interior Painting: Paint finish.

L. Section 09 96 00 - High-Performance Coatings: Surface Preparation.

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; 2024.

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.

D. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2024.

E. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.

F. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.

G. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.

H. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.

I. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021, with Errata (2023).

J. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025.

K. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).

L. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

M. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).

1.04 SUBMITTALS

A. See Section 01 30 00 - 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' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

A. Steel Sections: ASTM A36/A36M.

B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.

C. Plates: ASTM A283/A283M.

D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black and hot-dip galvanized finish, as indicated.

E. Mechanical Fasteners: Same material as or compatible with materials being fastened; type consistent with design and specified quality level.

F. Bolts, Nuts, and Washers: ASTM A307, Grade A, plain.

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 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. Furnish 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, crowned cap, as detailed; prime paint finish.

B. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking; prime paint finish.

C. Lintels: As detailed; galvanized finish.

D. Elevator Hoistway Divider Beams: Beam sections; prime paint finish.

2.04 FINISHES - STEEL

A. Prime paint steel items.
   1. Exceptions: Galvanize items to be embedded in concrete and items to be embedded in masonry.

B. Prepare surfaces to be primed in accordance with SSPC-SP2.

C. Prepare surfaces to receive high performance coatings in accordance with SSPC-SP6.

D. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

E. Prime Painting: One coat.

F. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.

G. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

2.05 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.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Furnish 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. 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 on drawings.

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 , 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 05 50 00

SECTION 05 51 00
METAL STAIRS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Stairs with concrete treads.

B. Structural steel stair framing and supports.

C. Handrails and guards.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Concrete fill in stair pans; mesh reinforcement for landings.

B. Section 03 30 00 - Cast-in-Place Concrete: Placement of metal anchors in concrete.

C. Section 05 50 00 - Metal Fabrications.

D. Section 05 52 13 - Pipe and Tube Railings: Metal handrails for the stairs specified in this section.

E. Section 09 91 13 - Exterior Painting: Paint finish.

F. Section 09 91 23 - Interior Painting: Paint finish.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. AISC 201 - AISC Certification Program for Structural Steel Fabricators, Standard for Steel Building Structures; 2006.

C. ASTM A6/A6M - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling; 2024b.

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; 2024.

F. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.

G. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

H. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2024.

I. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.

J. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.

K. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

L. 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; 2024.

M. 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.

N. 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; 2023.

O. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.

P. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021, with Errata (2023).

Q. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025.

R. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019, with Editorial Revision (2025).

S. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

T. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).

U. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

V. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).

1.04 SUBMITTALS

A. See Section 01 30 00 - 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.

C. Design Data: As required by authorities having jurisdiction.

D. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

E. Designer's Qualification Statement.

F. 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 the State in which the Project is located, or personnel under direct supervision of such an engineer.

B. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and dated no more than 12 months before start of scheduled welding work.

C. Fabricator Qualifications:
   1. A qualified steel fabricator that is certified by the American Institute for Steel Construction (AISC) under AISC 201.
   2. A company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.

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. Regulatory Requirements: Provide stairs and railings that comply with most stringent requirements of local, state, and federal regulations; where requirements of Contract Documents exceed those of regulations, comply with Contract Documents.
   2. Handrails: Comply with applicable accessibility requirements of ADA Standards.

3. Structural Design: Provide complete stair and railing assemblies that comply with the applicable local code.
4. Dimensions: As indicated on drawings.
5. Shop assemble components; disassemble into largest practical sections suitable for transport and access to site.
6. No sharp or rough areas on exposed travel surfaces and surfaces accessible to touch.
7. Separate dissimilar metals using paint or permanent tape.

B. Metal Jointing and Finish Quality Levels:
1. Architectural: All joints as inconspicuous as possible, whether welded or mechanical.
a. Welded Joints: Continuously welded and ground smooth and flush.
b. Mechanical Joints: Butted tight, flush, and hairline; concealed fastenings only.
c. Exposed Edges and Corners: Eased to small uniform radius.
d. Metal Surfaces to be Painted: Sanded or ground smooth, suitable for highest quality gloss finish.
2. 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.
3. Industrial: All joints made neatly.
a. Welded Joints: Welded on back side wherever possible.
b. Welds Exposed to Touch: Ground smooth.
c. Bolts Exposed to Touch in Travel Area: No nuts or screw threads exposed to touch.

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: Architectural, as defined above.

B. Finish:
1. Stringer, Treads and Pans: Field finished with interior painting system.
2. Railing System: Steel

C. Risers: Closed.

D. Treads: Metal pan with field-installed concrete fill.
1. Concrete Depth: 1-1/2 inches, minimum.
2. Tread Pan Material: Steel sheet.
3. Tread Pan Thickness: As required by design; 14 gauge, 0.075 inch minimum.
4. Pan Anchorage to Stringers: Continuously welded, from top or bottom.
5. Concrete Reinforcement: Welded wire mesh.
6. Concrete Finish: For resilient floor covering.

E. Risers: Same material and thickness as tread pans.
1. Riser/Nosing Profile: Sloped riser with rounded nosing of minimum radius.
2. Nosing Depth: Not more than 1-1/2 inch overhang.
3. Nosing Return: Flush with top of concrete fill, not more than 1/2 inch wide.

F. Stringers: Rolled steel tubes.

1. Stringer Depth: 10 inches.
2. End Closure: Sheet steel of same thickness as risers welded across ends.

G. Landings: Same construction as treads, supported and reinforced as required to achieve design load capacity.

H. Railings: Steel pipe railings.

I. Finish: Shop- or factory-prime painted.

J. 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: See Section 03 30 00.

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, and comply with VOC limitations of authorities having jurisdiction.

D. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, and comply 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, and hangers 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 05 51 00

SECTION 05 52 13
PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall mounted handrails.

B. Stair railings and guardrails.

C. Free-standing railings at steps.

D. Balcony railings and guardrails.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Placement of anchors in concrete.

B. Section 04 20 00 - Unit Masonry: Placement of anchors in masonry.

C. Section 05 51 00 - Metal Stairs: Attachment plates for handrails specified in this section.

D. Section 09 21 16 - Gypsum Board Assemblies: Placement of backing plates in stud wall construction.

E. Section 09 91 13 - Exterior Painting: Paint finish.

F. Section 09 91 23 - Interior Painting: Paint finish.

1.03 REFERENCE STANDARDS

A. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.

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. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

D. AISC 201 - AISC Certification Program for Structural Steel Fabricators, Standard for Steel Building Structures; 2006.

E. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2024.

F. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.

G. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.

H. ASTM E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings; 2024.

I. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.

J. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025.

K. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, 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.

C. Samples: Submit one, 12 inch long samples of handrail. Submit one sample of elbow, wall bracket, and end stop.

D. Sample: Submit two, 6 x 6 inch samples of handrail infill panels.

1.05 QUALITY ASSURANCE

A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located, 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 company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

PART 2 PRODUCTS

2.01 RAILINGS - GENERAL REQUIREMENTS

A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of applicable local code.

B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 75 pounds per linear foot applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935

C. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935

D. Allow for expansion and contraction of members and building movement without damage to connections or members.

E. Dimensions: Refer to drawings.

F. 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 welding anchors.
   2. For anchorage to masonry, provide brackets to be embedded in masonry, for welding anchors.
   3. For anchorage to stud walls, provide backing plates, for bolting anchors.

G. Provide welding fittings 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.

2.02 STEEL RAILING SYSTEM

A. Steel Tube: ASTM A500/A500M Grade B cold-formed structural tubing.

B. Steel Pipe: ASTM A53/A53M Grade B Schedule 80, finish as indicated on drawings.

C. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.

D. Exposed Fasteners: No exposed bolts or screws.

E. Straight Splice Connectors: Steel concealed spigots.

F. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.03 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.

E. 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. Clean welds, bolted connections, and abraded areas.
   4. Touch up shop primer and factory-applied finishes.
   5. Repair galvanizing with galvanizing repair paint per ASTM A780/A780M.

F. Exposed ends of pipe rails to end caps fully welded and ground smooth.

2.04 STEEL FINISHES

A. High Performance Powder Coating System: AAMA 2604 multiple coat, thermally cured fluoropolymer system.

B. Color: To be selected by Architect from manufacturer's full line

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 or embedded in masonry 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. Install railings in compliance with ADA Standards for accessible design at applicable locations.

D. Anchor railings securely to structure.

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: 1/4 inch per floor level, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION 05 52 13

SECTION 05 73 00
DECORATIVE METAL RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Railing systems.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Placement of anchors in concrete.

B. Section 09 21 16 - Gypsum Board Assemblies: Placement of backing plates and wood blocking in stud wall construction.

1.03 REFERENCE STANDARDS

A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

B. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

C. AISC 201 - AISC Certification Program for Structural Steel Fabricators, Standard for Steel Building Structures; 2006.

D. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2024.

E. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 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. ASTM E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings; 2024.

I. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.

J. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025.

K. NAAMM AMP 500-06 - Metal Finishes Manual; 2006.

L. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Submit manufacturer's product data, including description of materials, components, finishes, fabrication details, glass, anchors, and accessories.

C. 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.
   1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
   2. Include design engineer's seal and signature on each sheet of shop drawings.

D. Delegated Design Documents: Drawings and calculations sealed by Designer.

E. Test Reports: Submit test reports from independent testing agency showing compliance with specified design and performance requirements.

F. Manufacturer's Instructions: Indicate installation.

G. Specimen warranty.

H. Executed warranty.

1.05 QUALITY ASSURANCE

1.06 MOCK-UPS

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. Provide mock-up of railing system, 4 feet long by 4 feet wide, indicating each type of material, cladding, and finish.

C. Locate where directed.

D. Mock-up may remain as part of work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in factory-provided protective coverings and packaging.

B. Protect materials against damage during transit, delivery, storage, and installation at site.

C. Inspect materials upon delivery for damage. Replace damaged items.

D. Prior to installation, store materials and components under cover in dry location.

1.08 FIELD CONDITIONS

A. Ambient Conditions:
   1. Do not install railings until project is enclosed and ambient temperature of space is minimum 65 degrees F and maximum 95 degrees F.
   2. 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. Manufacturer's Warranty: Manufacturer's standard 1-year warranty against defects in materials, fabrication, finishes, and installation commencing after the substantial completion date; complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 RAILING SYSTEMS

A. General: Factory- or shop-fabricated to suit project conditions, for proper connection to building structure, and in largest sizes practical for delivery to site.

B. Performance Requirements:
   1. Comply with ASTM E985.
   2. Comply with ADA Standards.
   3. Structural Requirements: Design and fabricate railings and anchorages to resist loads without failure, damage, or permanent set.
      a. Handrail and Top Rails: Applying loads simultaneously not required:
         1) Distributed Load: 50 lbf/ft minimum, applied horizontally and vertically at top of handrail.
         2) Concentrated Load: 200 lbf, minimum, when applied to handrail horizontally and vertically.
      b. Infill:
         1) Concentrated Load: 50 lbf, minimum, when applied to infill horizontally and vertically.

C. Performance Requirements: Applying loads simultaneously not required; design and fabricate railings and anchorages to resist loads without failure, damage, or permanent set, including:
   1. Lateral Force: 75 lb minimum, when tested in accordance with ASTM E935.
   2. Distributed Load: 50 lbf/ft minimum, applied vertically and horizontally at top of handrail, when tested in accordance with ASTM E935.
   3. Concentrated Loads: 200 lb minimum, applied to handrail horizontally and vertically, in accordance with ASTM E935.

D. Assembly: Use slip-on, nonweld mechanical fittings, flanges, escutcheons, and wall brackets to join lengths, seal open ends, and conceal exposed mounting bolts and nuts.

E. Joints: Machined smooth with hairline seams; tightly fitted and secured.

F. Field Connections: Provide sleeves to accommodate site assembly and installation.

G. Metal Railing: Engineered, post-supported railing system with metal pickets as indicated.
   1. Configuration: Guardrail with separate handrail.
   2. Decorative Flanges for Embedded Posts: Circular, collared cover plate without screw holes.
   3. Wall-Mounted Components: Support railing with 1-1/2-inch clearance from wall using the following:
   4. Handrail Brackets: Same metal as railing.
   5. Fasteners: Concealed.
   6. Infill at Pipe Railings: Pipe or tube rails sloped parallel to stair.
      a. Outside Diameter: 1-1/2 inches.
      b. Material: Steel pipe or tube, round.
      c. Jointing: Welded and ground smooth and flush.
   7. Custom Fabricated Infill at Metal Tube Railings:
      a. Material: Solid steel bar.
      b. Shape: Round.
      c. Tube Size: 3/4-inch IPS / 1.05-inch OD.
      d. Top Mounting: Welded to underside of top rail.
      e. Bottom Mounting: Welded to top surface of stringer.
   8. End and Intermediate Posts: As shown on drawings.
      a. Mounting: Welded.

2.02 FABRICATION

A. Welded and Brazed Joints: Make visible joints butt tight, flush, and hairline; use methods that avoid discoloration and damage of finish; grind smooth, polish, and restore to required finish.
   1. Ease exposed edges to small uniform radius.
   2. Welded Joints:

2.03 FINISHES

A. General: Comply with NAAMM AMP 500-06.
   1. Complete mechanical finishes before fabrication. After fabrication, finish joints, bends, abrasions, and surface blemishes to match sheet.
   2. Protect mechanical finishes on exposed surfaces from damage.
   3. Apply organic and anodic finishes to formed metal after fabrication.
   4. Appearance: Limit variations in appearance of adjacent pieces to one-half of range represented in approved samples. Noticeable variations in same piece are not acceptable. Install components within range of approved samples to minimize contrast.

B. Steel Finishes:
   1. Primer: Compatible with organic coating; shop-applied.
   2. Color: As indicated on drawings.

2.04 ACCESSORIES

A. Welding Fittings: Factory- or shop-welded from matching pipe or tube; joints and seams ground smooth.

B. Anchors and Fasteners: Provide anchors, fasteners, and other attachment devices required to attach to structure.
   1. Exposed Fasteners: Not allowed.

C. Shop and Touch-Up Primer: SSPC-Paint 15; comply with VOC limitations of authorities having jurisdiction.

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 are corrected.

3.02 PREPARATION

A. Review installation drawings before beginning installation. Coordinate diagrams, templates, instructions, and directions for installation of anchorages and fasteners.

B. Clean surfaces to receive railings. Remove materials and substances detrimental to installation.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install components plumb and level, accurately fitted, free from distortion or defects, and with tight joints, except where necessary for expansion.

C. Anchor securely to structure.

D. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

E. 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. Clean welds, bolted connections, and abraded areas.
   4. Touch up shop primer and factory-applied finishes.
   5. Repair galvanizing with galvanizing repair paint in accordance with ASTM A780/A780M.

F. Isolate dissimilar materials with bituminous coating, bushings, grommets, or washers to prevent electrolytic corrosion.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per floor level, noncumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

3.05 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. Test railings for structural performance in accordance with ASTM E935.

C. Manufacturer Services: Provide services of manufacturer's field representative to observe railing installation.

3.06 CLEANING

A. Remove protective film from exposed metal surfaces.

B. Metal: Clean exposed metal finishes with potable water and mild detergent in accordance with manufacturer recommendations; do not use abrasive materials or chemicals, detergents, or other substances that may damage material or finish.

3.07 PROTECTION

A. Protect installed components and finishes from damage after installation.

B. Repair damage to exposed, making finishes indistinguishable from undamaged areas.

C. Replace finishes and components that have irreparable damage. Ensure damaged areas are indistinguishable from undamaged finishes and surfaces.

END OF SECTION 05 73 00

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Rough opening framing for doors, windows, and roof openings.
B. Roof-mounted curbs.
C. Roofing nailers.
D. Roofing cant strips.
E. Fire retardant treated wood materials.
F. Miscellaneous framing and sheathing.
G. Communications and electrical room mounting boards.
H. Concealed wood blocking, nailers, and supports.
I. Miscellaneous wood nailers, furring, and grounds.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Setting anchors in concrete.
B. Section 03 54 00 - Cast Underlayment.
C. Section 05 40 00 - Cold-Formed Metal Framing: Blocking for wall mounted items.
D. Section 05 50 00 - Metal Fabrications: Miscellaneous steel connectors and support angles for wood framing.
E. Section 07 25 00 - Weather Barriers: Water-resistive barrier over sheathing.
F. Section 07 62 00 - Sheet Metal Flashing and Trim: Sill flashings.
G. Section 07 72 00 - Roof Accessories: Prefabricated roof curbs.
H. Section 09 21 16 - Gypsum Board Assemblies: Gypsum-based sheathing.

1.03 REFERENCE STANDARDS

A. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003 (Reapproved 2017).
B. 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.
C. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.
D. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2025.
E. ASTM D3498 - Standard Specification for Adhesives for Field-Gluing Wood Structural Panels (Plywood or Oriented Strand Board) to Wood Based Floor System Framing; 2019a.
F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
G. AWPA U1 - Use Category System: User Specification for Treated Wood; 2024.
H. PS 1 - Structural Plywood; 2023.
I. PS 20 - American Softwood Lumber Standard; 2021.
J. SPIB (GR) - Standard Grading Rules; 2021.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide technical data on insulated sheathing, wood preservative materials, and application instructions.

C. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

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.

B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, and installation.

1.06 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Correct defective work within a two-year period commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
   2. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee at www.alsc.org, and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

B. Lumber fabricated from old growth timbner is not permitted.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: S-dry or MC19.

D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

2.03 CONSTRUCTION PANELS

A. Subfloor/Underlayment Combination: PS 1 or PS 2 type, rated Single Floor.
   1. Panel Type: Plywood.
   2. Bond Classification: Exposure 1.
   3. Edges: Square.

B. Wall Sheathing: Plywood, PS 1, Grade C-D, Exposure I.

C. Wall Sheathing: Wood construction panel laminated to insulation board.
   1. Construction Panel: 5/8 inch (16 mm) CDX plywood.
   2. Insulation Board: Polyisocyanurate foam plastic with cellulosic felt facer or glass fiber mat facer on major surface opposite construction panel.
   3. Finished Panel: Comply with ASTM C1289, Type V.
   4. Products:
      a. Carlisle Coatings & Waterproofing, Inc; R2+ Base: www.carlisleccw.com/#sle.
      b. Hunter Panels; Xci Ply: www.hunterpanels.com/#sle.
      c. Atlas Roofing; ACFoam Nailbase; https://roof.atlasrwi.com/.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

D. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

2.04 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Stainless steel for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
   2. Gypsum Board Screws: ASTM C1002; Type W, bugle head, self-piercing, tapping screws; length to penetrate wood members 5/8 inch minimum.
   3. Anchors: Toggle bolt type for anchorage to hollow masonry.

B. Construction Adhesives: Adhesives complying with ASTM C557 or ASTM D3498.

C. Subfloor Adhesives: Gap-filling construction adhesive for bonding wood structural panels to wood-based floor system framing; complying with ASTM D3498.

D. Water-Resistive Barrier: See Section 07 25 00.

2.05 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA 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.

B. Fire Retardant Treatment:
   1. Products:
      a. Lonza Group: www.wolmanizedwood.com/#sle.
      b. Hoover Treated Wood Products, Inc: www.frtw.com/#sle.
      c. Koppers, Inc: www.koppersperformancechemicals.com/#sle.
      d. Viance, LLC; D-Blaze: www.treatedwood.com/#sle.
      e. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Interior Type A: AWPA 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.

PART 3 EXECUTION

3.01 PREPARATION

A. 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 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 authorities having jurisdiction 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. Provide the following specific nonstructural 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. Marker boards and tack boards.
   8. Wall paneling and trim.
   9. Joints of rigid wall coverings that occur between studs.
   10. All other miscellaneous wall mounted items.

3.04 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 each roof opening except where prefabricated curbs are specified and where specifically indicated otherwise; form corners by alternating lapping side members.

3.05 INSTALLATION OF CONSTRUCTION PANELS

A. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.
   1. Place water-resistive barrier horizontally over wall sheathing, weather lapping edges and ends.

B. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
   1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
   2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
   3. Install adjacent boards without gaps.

3.06 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.

B. Variation from Plane, Other than Floors: 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.07 CLEANING

A. Waste Disposal: See Section 01 74 19 - Construction Waste Management and Disposal.
   1. Comply with applicable regulations.
   2. Do not burn scrap on project site.
   3. Do not burn scraps that have been pressure treated.

4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION 06 10 00

SECTION 06 20 00
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Finish carpentry items.

B. Hardware and attachment accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Support framing, grounds, and concealed blocking.

B. Section 06 41 00 - Architectural Wood Casework: Shop fabricated custom cabinet work.

C. Section 08 14 16 - Flush Wood Doors.

D. Section 08 80 00 - Glazing: Glass and glazing of wood partitions and screens.

E. Section 09 91 23 - Interior Painting: Painting of finish carpentry items.

F. Section 09 93 00 - Staining and Transparent Finishing: Staining and transparent finishing of finish carpentry items.

1.03 REFERENCE STANDARDS

A. ANSI A135.4 - Basic Hardboard; 2012 (Reaffirmed 2020).

B. AWI (QCP) - Quality Certification Program; Current Edition.

C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

D. AWMAC (GIS) - Guarantee and Inspection Services Program; current edition at www.awmac.com/gis.php.

E. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.1; 2016, with Errata (2017).

F. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2016.

G. PS 20 - American Softwood Lumber Standard; 2021.

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 30 00 - Administrative Requirements for submittal procedures.

B. Product Data:
   1. Provide data on fire retardant treatment materials and application instructions.
   2. Provide instructions for attachment hardware and 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 information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
   3. Include certification program label.

D. Samples: One sample of each finish material and color.

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. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.

B. Quality Certification:
1. Provide labels or certificates indicating that work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
2. Provide designated labels on shop drawings as required by certification program.
3. Provide designated labels on installed products as required by certification program.
4. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

1.07 MOCK-UPS

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. Provide plastic laminate collaboration room cubby mock-up, illustrating finish and construction. Mock-up shall be minimum 3 units wide, and illustrate at least one panel joint.

C. Locate where directed.

D. Mock-up may remain as part of the work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Store finish carpentry items under cover, elevated above grade, and in a dry, well-ventilated area not exposed to heat or sunlight.

B. Protect from moisture damage.

C. Handle materials and products to prevent damage to edges, ends, or surfaces.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Surface Burning Characteristics: Provide materials having fire and smoke properties as required by applicable code.

C. Interior Woodwork Items:
1. Moldings, Bases, Casings, and Miscellaneous Trim: White oak; prepare for paint or stain finish.
2. Stairs and Benches: White oak; prepare for stained finish.
3. Loose Shelving: White oak; prepare for paint or stain finish.

2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

2.03 LUMBER MATERIALS

A. Softwood Lumber Interior: white pine species, quarter sawn, maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish.

B. Hardwood Lumber: White Oak species, quarter sawn, maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish.
1. Grading: In accordance with NHLA G-101 Grading Rules; www.nhla.org.

2.04 SHEET MATERIALS

A. Hardwood Plywood: Face species as indicated, plain sawn, book matched, 12 ply plywood core; HPVA HP-1 Front Face Grade AA, Back Face Grade 1, glue type as recommended for application.

2.05 PLASTIC LAMINATE MATERIALS

A. Manufacturers
   1. Basis of Design: High Wear Laminate by Wilsonart LLC[<>]: www.wilsonart.com/#sle
   2. Substitutions: See Section 01 60 00 - Product Requirements.

B. Laminate Adhesive: Type recommended by laminate manufacturer to suit application; not containing formaldehyde or other volatile organic compounds.

C. Exposed Edge Treatment: Molded PVC edge with T-spline, sized to completely cover edge of panel. Color to match laminate.

D. Schedule:
   1. High wear plastic laminate to be used for wall applications at stage surround in the cafeteria.

2.06 FASTENINGS

A. Fasteners: Of size and type to suit application.

B. Concealed Joint Fasteners: Threaded steel.

2.07 ACCESSORIES

A. Adhesive: Type recommended by fabricator to suit application.

B. Lumber for Shimming and Blocking: Softwood lumber of indicated species.

C. Wood Filler: Solvent base, tinted to match surface finish color.

D. Attachment Accessories: _____.
   1. "Z" clips
   2. Dismountable Connections: www.richelieu.com

2.08 HARDWARE

2.09 SITE FINISHING MATERIALS

A. Stain and Finishing Materials: In compliance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

2.10 FABRICATION

A. Shop assemble work for delivery to site, permitting passage through building openings.

B. Fit exposed sheet material edges with 3/8 inch matching hardwood edging. Use one piece for full length only.

C. Shop prepare and identify components for book match grain matching during site erection.

D. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

E. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.

2.11 SHOP 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 as follows:
   1. Transparent:
      a. System - 4, Latex Acrylic, Water-based.
      b. Stain: As selected by Architect.
      c. Sheen: Flat.

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 custom fabrications in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) 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 16 inch on center.

3.03 PREPARATION FOR SITE FINISHING

A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.

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 06 20 00

SECTION 06 41 00
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Specially fabricated cabinet units.

B. Cabinet hardware.

C. Preparation for installing utilities.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Support framing, grounds, and concealed blocking.

B. Section 12 36 00 - Countertops.

1.03 REFERENCE STANDARDS

A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

C. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.1; 2016, with Errata (2017).

D. BHMA A156.9 - Cabinet Hardware; 2020.

E. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. 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 information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).

C. Product Data: Provide data for hardware accessories.

D. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches square, illustrating proposed cabinet, countertop, and shelf unit substrate and finish.

E. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.

F. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

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 in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.

1.07 MOCK-UPS

A. Provide mock-up of typical base cabinet, wall cabinet, and countertop, including hardware, finishes, and plumbing accessories.

B. See Section 01 40 00 - Quality Requirements for additional requirements.

C. Locate where directed.

D. Mock-up may remain as part of the work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Protect units from moisture damage.

1.09 FIELD CONDITIONS

A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Case Systems; www.casesystems.com.

B. Stevens Industries Inc; www.stevensind.com.

C. TMI Systems Corporation; www.tmisystems.com.

D. Any certified AWI custom cabinet manufacturer.

E. Substitutions: See Section 01 60 00 - Product Requirements.

F. Single Source Responsibility: Provide and install this work from single fabricator.

G. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

H. Plastic Laminate Faced Cabinets: Custom grade.

2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

2.03 LAMINATE MATERIALS

A. Manufacturers:
   1. Arborite; ColorEdge: www.arborite.com/#sle.
   2. Formica Corporation: www.formica.com/#sle.
   3. Wilsonart LLC: www.wilsonart.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.

C. Provide specific types as indicated.
   1. Horizontal Surfaces: HGS, 0.048 inch nominal thickness, through color, color as selected.
   2. Vertical Surfaces: VGS, 0.028 inch nominal thickness, through color, color as selected.
   3. Post-Formed Horizontal Surfaces: HGP, 0.039 inch nominal thickness.
   4. Cabinet Liner: CLS, 0.020 inch nominal thickness, color as selected.
   5. Laminate Backer: BKL, 0.020 inch nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.
   6. Interior of units shall be melamine laminate available in manufacturer's standard dove grey, frosty white, or light beige color.

2.04 COUNTERTOPS

A. Countertops: See Section 12 36 00.

2.05 ACCESSORIES

A. Adhesive: Type recommended by fabricator to suit application.

B. Plastic Edge Banding: 3mm Extruded PVC, flat shaped; smooth finish; self locking serrated tongue; of width to match component thickness.
   1. Color: As selected by Architect from manufacturer's full range.
   2. Use at all exposed door and drawer edges.

C. Fasteners: Size and type to suit application.

D. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; chrome-plated finish in concealed locations and chrome-plated finish in exposed locations.

E. Concealed Joint Fasteners: Threaded steel.

F. Grommets: Standard rubber grommets for cut-outs, in color to blend with adjacent surface.

2.06 HARDWARE

A. Hardware: BHMA A156.9, types as recommended by fabricator for quality grade specified.

B. Adjustable Shelf Supports: Standard side-mounted system using recessed metal shelf standards or multiple holes for pin supports and coordinated self rests, satin chrome finish, for nominal 1 inch spacing adjustments.

C. Countertop Brackets: Fixed, concealed vertical leg, side-of-stud mounting.
   1. Materials: Steel L- and T-shapes.
      a. Finish: Manufacturer's standard, factory-applied, powder coat.
      b. Color: Black.
      c. Vertical Leg: 18 inches.
      d. Support Member Depth: 1/2 inch.
      e. Support Member Width: 2 inches
   2. Products:
      a. A&M Hardware, Inc; Concealed Flat Brackets: www.aandmhardware.com/#sle.
      b. Centerline Brackets; Floating Wall Mount: www.countertopbracket.com/#sle.
      c. Rakks/Rangine Corporation; Inside Wall Flush Mount Brackets: www.rakks.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

D. Countertop Supports:
   1. Material: Aluminum
   2. Finish/Color: As selected by architect from manufacturer's available options.

E. Drawer and Door Pulls: "U" shaped wire pull, aluminum with satin finish, 4 inch centers.

F. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with satin finish.
   1. Provide locks on all teachers wardrobe units.
   2. Each room to be keyed individually and tied into master keyed system.

G. Cabinet Catches and Latches:
   1. Minimum 7 lb. pull, provide 2 per door for units over 48 inches high.
   2. Elbow catches shall be used on inactive doors less than 73" tall.

H. Drawer Slides:
   1. Type: Full extension.
   2. Static Load Capacity: Heavy Duty grade.
   3. Mounting: Side mounted.
   4. Stops: Integral type.
   5. Features: Provide self closing/stay closed type.
   6. Manufacturers:
      a. Accuride International, Inc: www.accuride.com/#sle.
      b. Grass America Inc: www.grassusa.com/#sle.
      c. Hettich America, LP: www.hettich.com/#sle.
      d. Knape & Vogt Manufacturing Company: www.knapeandvogt.com/#sle.
      e. Substitutions: See Section 01 60 00 - Product Requirements.

I. Hinges: European style concealed type, steel with satin finish.
   1. Manufacturers:
      a. Grass America Inc: www.grassusa.com/#sle.
      b. Hardware Resources: www.hardwareresources.com/#sle.

c. Hettich America, LP: www.hettich.com/#sle.
d. Blum, Inc: www.blum.com/#sle.
e. Substitutions: See Section 01 60 00 - Product Requirements.

J. Chain Bolts:
1. Chain bolts shall be 3" long, shall have an 18" pull and an angle strike to prevent all cabinet doors next to wall from hitting wall.

K. Coat Rods:
1. Shall be 1 1/4" diameter, 14 gauge chrome plated steel in captive mounting hardware.

L. Pendaflex File Suspension Rails:
1. All file drawers shall include a pair of 14 gauge steel pendaflex file suspension rails. File followers, or other split bottom hardware, shall not be acceptable.

M. Hooks: Surface-mounted; stainless steel, satin finish.
1. Manufacturers:
a. Rockwood; an Assa Abloy Group company; _____: www.assaabloydss.com/#sle.
b. Sugatsune America, Inc; _____: www.sugatsune.com/#sle.
c. Substitutions: See Section 01 60 00 - Product Requirements.

2.07 FABRICATION

A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.

D. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises.
1. Cap exposed plastic laminate finish edges with material of same finish and pattern.

E. Mechanically fasten back splash to countertops as recommended by laminate manufacturer at 16 inches on center.

F. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION

A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.

B. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.

C. Use fixture attachments in concealed locations for wall mounted components.

D. Use concealed joint fasteners to align and secure adjoining cabinet units.

E. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.

F. Secure cabinets to floor using appropriate angles and anchorages.

G. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

3.03 ADJUSTING

A. Test installed work for rigidity and ability to support loads.

B. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING

A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION 06 41 00

SECTION 06 83 16
FIBERGLASS REINFORCED PANELING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fiberglass reinforced plastic panels.

B. Trim.

1.02 RELATED REQUIREMENTS

A. Section 09 51 00 - Acoustical Ceilings: Ceiling suspension system.

1.03 REFERENCE STANDARDS

A. 9 CFR 416.2 - Regulatory Requirements Under the Federal Meat Inspection Act and the Poultry Products Inspection Act, Part 416-Sanitation; current edition.

B. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2024.

C. ASTM D2583 - Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor; 2013a.

D. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.

E. ASTM D5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels; 2022.

F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.

G. FDA Food Code - Chapter 6 - Physical Facilities; Current Edition.

H. FM 4880 - Examination Standard for Class 1 Fire Rating of Building Panels or Interior Finish Materials; 2022.

I. ISO 846 - Plastics - Evaluation of the Action of Microorganisms; 2019.

J. ISO 2812-1 - Paints and Varnishes -- Determination of Resistance to Liquids -- Part 1: Immersion in Liquids Other than Water; 2017.

1.04 SUBMITTALS

A. See Section 01 30 00 - 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 6 x 6 inch in size illustrating material and surface design of panels.

D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.

1.05 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. Basis of Design Marlite: www.marlite.com, Standard FRP
   2. Crane Composites, Inc[<>]: www.cranecomposites.com.
   3. Nudo: www.nudo.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PANEL SYSTEMS

A. Wall Panels:
   1. Panel Size: 4 by 10 feet.
   2. Panel Thickness: 0.10 inch.
   3. Surface Design: Embossed.
   4. Color: As selected by Architect.
   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. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   4. Scratch Resistance: Barcol hardness score greater than 35, when tested in accordance with ASTM D2583.
   5. Impact Strength: Greater than 6 ft lb force per inch, when tested in accordance with ASTM D256.
   6. Sanitation and Cleanability: Comply with 9 CFR 416.2.
   7. Chemical Cleanability: Excellent chemical resistance to common cleaners and detergents when tested in accordance with ISO 2812-1.

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 06 83 16

SECTION 07 01 50
PREPARATION FOR RE-ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Partial replacement of existing roofing system in preparation for replacement roofing system in designated areas as indicated on drawings.

B. Removal of existing flashing and counterflashings.

C. Temporary roofing protection.

1.02 RELATED REQUIREMENTS

A. Section 07 41 13 - Metal Roofing Panel

B. Section 07 53 10 - Single Ply Roofing - Fully Adhered EPDM.

1.03 REFERENCE STANDARDS

A. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition.

B. NEMA MG 2 - Motors and Generators; National Electrical Manufacturers Association; 1993 (and Revision 1, 2, 3)

C. NFPA 70 - National Electrical Code; National Fire Protection Association; current edition.

D. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board; 2022.

E. ASTM C1153 - Standard Practice for Location of Wet Insulation in Roofing Systems Using Infrared Imaging; 2010 (Reapproved 2015).

F. ADMINISTRATIVE REQUIREMENTS
   1. Coordinate with affected mechanical and electrical work associated with roof penetrations.
   2. Preinstallation Meeting: Convene two weeks before starting work of this section.
      a. Attendees:
         1) Architect.
         2) Contractor.
         3) Owner.
         4) Installer.
      b. Meeting Agenda: Provide agenda to participants prior to meeting in preparation for discussions on the following:
         1) Removal and installation schedule.
         2) Necessary preparatory work.
         3) Protection before, during, and after roofing system installation.
         4) Removal of existing roofing system.
         5) Installation of new roofing system.
         6) Temporary roofing and daily terminations.
         7) Transitions and connection to and with other work.
   3. Schedule work to coincide with commencement of installation of new roofing system.

G. SUBMITTALS
   1. See Section 01 30 00 - Administrative Requirements for submittal procedures.
   2. Product Data: Submit for each type of material.
   3. Shop Drawings: Indicate size, configuration, and installation details.
   4. Installer's Qualification Statement.

H. QUALITY ASSURANCE
   1. Materials Removal Company Qualifications: Company specializing in performing work of type specified with at least three years of documented experience.
   2. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.

3. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.
4. Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose specified and indicated.

I. DELIVERY, STORAGE, AND HANDLING
1. Ensure storage and staging of materials does not exceed static and dynamic load-bearing capacities of roof decking.

J. FIELD CONDITIONS
1. Do not remove existing roofing membrane when weather conditions threaten the integrity of building contents or intended continued occupancy.
2. Maintain continuous temporary protection prior to and during installation of new roofing system.

K. WARRANTY
1. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
2. Existing Warranties: Perform this work using methods and materials that will maintain existing roof system warranties.
   a. Notify existing roof system warrantor prior to starting this work and obtain written instructions for procedures necessary to maintain this existing warranty.
   b. Upon completion of this work, notify warrantor of reroofing completion and obtain documentation to verify that existing roofing system has been inspected and warranty is still in effect.
      1) Submit documentation upon project closeout.

PART 2 PRODUCTS - NOT USED

2.01 ACCESSORIES

A. Fasteners: Type and size as required and compatible with existing and new roofing system to resist local wind uplift.

B. Roof Vent Pipe Extension: Solid-wall PVC fitting consisting of pipe and splice sleeve inserts, configured for insertion and sealing to existing plumbing vent piping, sized to fit inside diameter of plumbing vent piping, enabling extension of piping to field-determined height to meet local building code requirements for plumbing vent pipe height above existing roof level.

PART 3 EXECUTION

3.01 PROJECT

A. Schedule work to coincide with commencement of installation of new roofing system.

B. Coordinate the work with other affected trades including mechanical and electrical work associated with roof penetrations.

C. Do not store materials or park vehicles/ dumpsters in front of doorways.

D. No materials or equipment shall be stored on any existing roof system not scheduled to be removed.

E. Protections:
1. Protect paving, grass, building and site elements prior to starting work.
2. Restore to original condition or replace all work or materials damaged by roofing operations.
3. Remove protection upon completion of the roofing work.

F. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

G. Properly and lawfully dispose of roof debris to an off-site location.

3.02 EXAMINATION

A. Verify that existing roof surface has been cleared of materials being removed from existing roofing system and ready for next phase of work as required.

3.03 PREPARATION

A. Sweep roof surface clean of loose matter.

B. Remove loose refuse and dispose of properly off-site.

3.04 MATERIAL REMOVAL

A. Remove only existing roofing materials that can be replaced with new materials the same day.

B. Maintain continuous temporary protection prior to and during installation of new roofing system.

C. Remove all existing roof systems material, ncluding but not limited to, roofing membrane, insulation, vapor retarder, perimeter base flashings, flashings around roof protrusions, and as indicated on drawings.

D. Scrape roofing gravel from membrane surface without causing serious damage to membrane felts.

E. Remove damaged portions of roofing membrane, perimeter base flashings, flashings around roof protrusions, pitch pans and pockets.

F. Cut and lay flat any membrane blisters.

G. Remove damaged insulation and fasteners, cant strips, and blocking.

H. Remove vapor retarder.

I. Remove, raise, and reinstall roof mounted mechanical equipment, as required to install new roof system.

3.05 FIELD QUALITY CONTROL

A. The drawings identify the approximate limits to material removal.

B. Test Reports: Indicate existing insulation moisture content.

3.06 PROTECTION

A. Provide protection of existing roofing system that is not having work performed on it.

B. Provide temporary protective sheeting over uncovered deck surfaces.

C. Turn sheeting up and over parapets and curbing. Retain sheeting in position with weights.

D. Provide for surface drainage from sheeting to existing drainage facilities.

E. Do not permit traffic over unprotected or repaired deck surface.

F. Install recover board over existing membrane.

END OF SECTION 07 01 50

SECTION 07 21 00
THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Board insulation at cavity wall construction, perimeter foundation wall, underside of floor slabs, and exterior wall behind MCM wall finish.

B. Batt insulation in wall construction.

C. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

1.02 RELATED REQUIREMENTS

A. Section 04 20 00 - Unit Masonry: Board Insulation

B. Section 05 40 00 - Cold-Formed Metal Framing: Board insulation.

C. Section 06 10 00 - Rough Carpentry: Supporting construction for batt insulation.

D. Section 07 26 00 - Vapor Retarders: Separate vapor retarder materials.

E. Section 07 21 19 - Foamed-In-Place Insulation: Plastic foam insulation other than boards.

F. Section 07 25 00 - Weather Barriers: Separate air barrier and vapor retarder materials.

G. Section 07 53 00 - Elastomeric Membrane Roofing: Insulation specified as part of roofing system.

H. Section 07 84 00 - Firestopping: Insulation as part of fire-rated through-penetration assemblies.

I. Section 09 21 16 - Gypsum Board Assemblies: Acoustic insulation inside walls and partitions.

1.03 DEFINITIONS

A. Mineral Fiber Material Composition: Insulation referred to as mineral fiber block, board, and blanket insulation is composed of fibers from mineral based substances such as rock, slag, or glass and processed from the molten state into fibrous form.

1. Based on type of insulation substance, the material will be referred to as a mineral fiber when having a rock or slag base, and glass fiber with a glass or silica sand base, also considered a mineral.
2. Insulation blankets are flexible units consisting of felted, bonded, or unbonded fibers formed into rolls or flat cut pieces referred to as batts; rolls are simply longer versions of batts.
3. For additional information about mineral fiber and the various classification types, refer to the following reference standards; ASTM C553, ASTM C612, ASTM C665, and ASTM C726.

1.04 REFERENCE STANDARDS

A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.

B. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2024.

C. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.

D. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2014 (Reapproved 2019).

E. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2024.

F. ASTM C726 - Standard Specification for Mineral Wool Roof Insulation Board; 2024.

G. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2025.

H. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).

I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.

J. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.

K. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 Degrees C; 2024c.

L. ASTM E2357 - Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies; 2024.

M. FM DS 1-28 - Wind Design; 2016.

N. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2025.

1.05 SUBMITTALS

A. See Section 01 30 00 - 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.

D. Manufacturer's Installation Instructions: Include information on installation techniques.

1.06 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

B. Sequence work to ensure air barrier materials are in place before beginning work of this section.

C. Coordinate the work of Section 07 25 00 for installation of weather barrier materials.

1.07 APPLICATIONS

A. Insulation at Perimeter of Foundation: Extruded polystyrene (XPS) board.

B. Insulation Inside Masonry Cavity Walls: Expanded polystyrene (EPS) board.

C. Insulation Inside Prefabricated Wall Panels: Extruded polystyrene (XPS) board.

D. Insulation Over Metal Stud Framed Walls, Continuous: Extruded polystyrene (XPS).

E. Insulation in Metal Framed Walls: Batt insulation with no vapor retarder.

1.08 FOAM BOARD INSULATION MATERIALS

A. Expanded Polystyrene (EPS) Board Insulation: Comply with ASTM C578.
   1. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   2. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   3. Board Size: 48 inch by 96 inch.
   4. Board Thickness: As indicated on drawings.
   5. Board Edges: Square.
   6. Type and Compressive Resistance: Type IX, 25 psi (173 kPa), minimum.
   7. Type and Thermal Resistance, R-value: Type IX, 4.2 (0.74), minimum, per 1 inch thickness at 75 degrees F mean temperature.
   8. Products:
      a. Atlas Molded Products, a Division of Atlas Roofing Corporation; ThermalStar EPS Wall Insulation Board: www.atlasmoldedproducts.com/#sle.

b. InsulFoam LLC; InsulFoam _____: www.insulfoam.com/#sle.
c. Substitutions: See Section 01 60 00 - Product Requirements.

B. Extruded Polystyrene (XPS) Board Insulation: Complies with ASTM C578 with natural skin surfaces.
1. Type and Compressive Resistance: Type IV, 25 psi (173 kPa), minimum.
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. Type and Thermal Resistance, R-value: Type IV, 5.0 (0.88), minimum, per 1 inch thickness at 75 degrees F mean temperature.
5. Board Size: 48 x 96 inch.
6. Board Thickness: As indicated on Drawings.
7. Board Edges: Square.
8. Board Density: 1.8 lb/cu ft.
9. Type and Water Absorption: Type XII, 0.3 percent by volume, maximum, by total immersion.
10. Products:
a. Dow Chemical Company: www.dowbuildingsolutions.com/#sle.
b. Kingspan Insulation LLC: www.kingspan.com/#sle.
c. Owens Corning Corporation: www.ocbuildingspec.com/#sle.
d. Substitutions: See Section 01 60 00 - Product Requirements.

C. Rigid Cellular Polyisocyanurate (ISO) Thermal Insulation Board Faced with Plywood: Complying with ASTM C1289.
1. Classifications:
a. Type V: Faced with plywood on one major surface of core foam and glass fiber reinforced cellulosic felt or uncoated or coated polymer-bonded glass fiber mat facer on other major surface of 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. Compressive Strength: 25 psi
5. Board Size: 48 inch by 96 inch.
6. Plywood Thickness: 1/2 inch.
7. Insulation Board Thickness: As indicated on Drawings.
8. Board Edges: Square.
9. Products:
a. Atlas Roofing Corporation; ACFoam Nail Base Roof Insulation Panels: www.atlasroofing.com/#sle.
b. Hunter Panels; Xci Ply: www.hunterpanels.com/#sle.
c. Substitutions: See Section 01 60 00 - Product Requirements.

1.09 MINERAL FIBER BLANKET INSULATION MATERIALS

A. Flexible Glass Fiber Blanket Thermal Insulation: Preformed insulation, complying with ASTM C665; friction fit.
1. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
2. Thermal Resistance: R-value of 19.
3. Thickness: As indicated on drawings
4. Facing: Unfaced.
5. Products:
a. CertainTeed Corporation; _____: www.certainteed.com/#sle.
b. Johns Manville; _____: www.jm.com/#sle.
c. Owens Corning Corporation; EcoTouch PINK FIBERGLAS Insulation: www.ocbuildingspec.com/#sle.
d. Substitutions: See Section 01 60 00 - Product Requirements.

1.10 ACCESSORIES

A. Self-Adhered Transition Flashing: Multipurpose, self-adhered flashing with modified butyl adhesive, polyester fiber top sheet, and polypropylene interlayer.
   1. Application: Primerless adhesion for use as through-wall flashings and wall transitions to roof and below-grade systems.
   2. Thickness: 45 mil, 0.045 inch, nominal.
   3. Size: 24 inches wide, in rolls 75 feet long.
   4. Tensile Strength: Greater than 1,300 psi complying with ASTM D412 test method.

B. Tape: Reinforced polyethylene film with acrylic pressure sensitive adhesive.

C. Flashing Tape: Special reinforced film with high performance adhesive.
   1. Application: Window and door opening flashing tape.
   2. Width: As required for application.
   3. Primer: Tape manufacturer's recommended product.

D. Sill Plate Sealer: Closed-cell foam tape with rubberized adhesive membrane; bridges gap between foundation structure and sill plate or skirt board.
   1. Width: 5-1/2 inches.
   2. Ultraviolet (UV) and Weathering Resistance: Approved in writing by manufacturer for up to 30 days of weather exposure.

E. Tape joints of rigid insulation in accordance with roofing and insulation manufacturers' instructions.

F. Insulation Fasteners: Appropriate for purpose intended.
   1. Length as required for thickness of insulation material and penetration of deck substrate.

G. Continuous Insulation (CI) Support Systems: Composite framing support (CFS) system consisting of insulated fiberglass reinforced plastic (FRP) girts that support CI and provide cladding attachment support integrated with metal wall panels or fiber cement exterior wall cladding.
   1. Substrate: Attach CFS system components to exterior sheathing over metal stud framing.
   2. Depth of Girts: As indicated on drawings.
   3. Length: 6 inches for clips, and 96 inches for girts.
   4. Spacing of Girts: 16 inches on center, vertically.
   5. Products:
      a. Advanced Architectural Products, LLC; SMARTci GREENGirt Clips - Thermal Spacer series: www.smartcisystems.com/#sle.
      b. Armatherm; Z Girt Structural Thermal Break: www.armatherm.com/#sle.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

H. Adhesive: Type recommended by insulation manufacturer for application.

PART 3 EXECUTION

2.01 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 irregularities or materials or substances that may impede adhesive bond.

2.02 BOARD INSTALLATION AT FOUNDATION PERIMETER

A. Adhere a 6 inches wide strip of polyethylene sheet over construction, control, and expansion joints with double beads of adhesive each side of joint.
   1. Tape seal joints.
   2. Extend sheet full height of joint.

B. Apply adhesive to back of boards:
   1. Three continuous beads per board length.

2. Full bed 1/8 inch thick.

C. Install boards horizontally on foundation perimeter.
   1. Place boards to maximize adhesive contact.
   2. Install in running bond pattern.
   3. Butt edges and ends tightly to adjacent boards and to protrusions.

D. Extend boards over expansion joints, unbonded to foundation on one side of joint.

E. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

2.03 BOARD INSTALLATION AT EXTERIOR WALLS

A. Adhere 6 inches wide strip of polyethylene sheet over expansion joints with double beads of adhesive each side of joint.

B. Install rigid insulation directly to steel studs or exterior grade sheathing at 16 inches on center with manufacturer recommended mechanical fasteners, and tape joints with manufacturer's minimum 4 inches wide sealant tape; comply with ASTM E2357.

C. Install boards horizontally on walls.
   1. Install in running bond pattern.
   2. Butt edges and ends tightly to adjacent boards and protrusions.

D. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

2.04 BOARD INSTALLATION AT CAVITY WALLS

A. Install boards to fit snugly between wall ties.

B. Install boards horizontally on walls.
   1. Install in running bond pattern.
   2. Butt edges and ends tightly to adjacent boards and protrusions.

C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

2.05 BOARD INSTALLATION USING COMPOSITE FRAMING SUPPORT (CFS) SYSTEM

A. Install CFS system in accordance with manufacturer's installation instructions.

B. Install CFS system in compliance with system orientation, sizes, and locations as indicated on drawings.

C. Install CFS system to fill-in exterior wall spaces without gaps or voids, and do not compress insulation boards.

D. Trim insulation neatly to fit spaces, and insulate miscellaneous gaps and voids with approved expandable foam sealant.

2.06 BOARD INSTALLATION UNDER CONCRETE SLABS

A. Place insulation under slabs on grade after base for slab has been compacted.

B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

C. Prevent insulation from being displaced or damaged while placing vapor retarder and placing slab.

2.07 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. Retain insulation batts in place with wire mesh secured to framing members.

F. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.

G. Coordinate work of this section with requirements for vapor retarder, see Section 07 26 00.

2.08 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for additional requirements.

2.09 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

SECTION 07 21 19
FOAMED-IN-PLACE INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Foamed-in-place insulation.
   1. In exterior wall crevices.
   2. At junctions of dissimilar wall and roof materials.

1.02 REFERENCE STANDARDS

A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.

B. ASTM D1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics; 2016 (Reapproved 2023).

C. ASTM D1622/D1622M - Standard Test Method for Apparent Density of Rigid Cellular Plastics; 2020.

D. ASTM D1623 - Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics; 2017 (Reapproved 2023).

E. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics; 2025.

F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.

G. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.

H. 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).

I. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week prior to commencing work of this section.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide product description, insulation properties, overcoat properties, and preparation requirements.

C. Manufacturer's Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.

D. Installer Qualification: Submit documentation of current contractor accreditation and current installer certification. Keep copies of all contractor accreditation and installer certification on site during and after installation. Present on-site documentation upon request.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than ten years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified, with minimum three years documented experience, and approved by manufacturer.

1.06 FIELD CONDITIONS

A. Do not apply foam when temperature is below that specified by the manufacturer for ambient air and substrate.

B. Do not apply foam when temperature is within 5 degrees F of dew point.

PART 2 PRODUCTS

2.01 MATERIALS

A. Foamed-In-Place Insulation: Low-density, flexible, closed cell, water vapor permeable polyurethane foam; foamed on-site, using blowing agent of water or non-ozone-depleting gas.
   1. Applications: Filling crevices in exterior envelope.
   2. Thermal Resistance: R-value of 3.0, minimum, per 1 inch thickness at 75 degrees F mean temperature when tested in accordance with ASTM C518.
   3. Air Permeance: 0.04 cfm per square foot, maximum, when tested at intended thickness in accordance with ASTM E2178 at 1.57 psf.
   4. Surface Burning Characteristics: Flame spread/smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.
   5. Basis of Design:
      a. Carlisle Spray Foam Insulation; SealTite Pro Closed Cell: www.carlislesfi.com/#sle.
   6. Manufacturers:
      a. BASF Corporation; WALLTITE®: www.spf.basf.com/#sle.
      b. Huntsman Building Solutions; Icynene® HFO 200: ww.huntsmanbuildingsolutions.com
      c. Johns Manville; JM IV HFO: www.jm.com/#sle.
   7. Substitutions: See Section 01 60 00 - Product Requirements.

B. Low Pressure Foamed-in-Place Insulation: Single component, expanding, low pressure-build, flexible polyurethane, gun-grade, insulating foam sealant.
   1. Applications: Around exterior window and door openings, between precast wall panel joints and other locations as indicated on drawings.
   2. Compliant with ASTM C1620.
   3. Compressive Strength, ASTM D1621: 3.0 psi.
   4. Dimensional Stability, ASTM D1622, Percent Volume Change at Two Weeks:
      a. 70-degrees C/100 %RH: -3.346.
      b. 70-degrees C/Ambient %RH: 3.131.
      c. -40-degrees C/Ambient %RH:2.951.
   5. Open Cell Content: Less than 75%.
   6. Tensile Strength, ASTM D1623: 9.5 psi (Type B).
   7. Tensile Strength, ASTM D1623: 5.5 psi (Type C).
   8. Elongation Percentage, ASTM D1623: 18.9% (Type B).
   9. Elongation Percentage, ASTM D1623: 16.7% (Type C).
   10. Shear Strength, ASTM C273: 7.3 psi.
   11. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.
   12. Basis of Design:
      a. Dow Chemical Company; Great Stuff Pro - Window and Door: www.greatstuff.dupont.com.
   13. Other Manufacturers:
      a. Hilti Corporation; CF 812 Window and Door: www.hilti.com.
      b. OSI; Quad Window & Door System: www.ositough.com.
   14. Substitutions: See Section 01 60 00 - Product Requirements.

C. Foamed-In-Place Insulation: Medium-density, rigid or semi-rigid, open cell or closed cell polyurethane foam; foamed on-site, using blowing agent of water or non-ozone-depleting gas.
   1. Applications: At junctions of dissimilar wall and roof materials.
   2. Thermal Resistance: R-value of 7.1, minimum, per 1-inch thickness at 75 degrees F mean temperature when tested in accordance with ASTM C518.
   3. Water Vapor Permeance: Vapor retarder; 2 perms, maximum, when tested at intended thickness in accordance with ASTM E96/E96M, desiccant method.

4. Water Absorption: Less than 2 percent by volume, maximum, when tested in accordance with ASTM D2842.
5. Air Permeance: 0.04 cfm per square foot, maximum, when tested at intended thickness in accordance with ASTM E2178 at 1.57 psf.
6. Closed Cell Content: At least 90 percent.
7. Surface Burning Characteristics: Flame spread/smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.
8. Basis of Design:
   a. Tytan Professional Thermal & Acoustic Gun PU Foam
9. Other Acceptable Products:
   a. BASF Corporation; WALLTITE US: www.spf.basf.com/#sle.
   b. Demilec LLC; HEATLOK HFO High Lift: www.demilec.com/#sle.
   c. Johns Manville; JM Corbond III Closed Cell Spray Polyurethane Foam: www.jm.com/#sle.
10. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ACCESSORIES

A. Primer: As required by insulation manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify work within construction spaces or crevices is complete before insulation application.

B. Verify that surfaces are clean, dry, and free of matter that may inhibit insulation adhesion.

C. Notify Architect of conditions that would be adversely affect the application.

D. Beginning apppication work implies applicator has accepted the conditions.

3.02 PREPARATION

A. Mask and protect adjacent surfaces from over spray or dusting.

B. Apply primer in accordance with manufacturer's instructions.

3.03 APPLICATION

A. Apply insulation in accordance with manufacturer's instructions.

B. Apply insulation by spray method, to a uniform monolithic density without voids.

C. Patch damaged areas.

D. Where applied to voids and gaps assure space for expansion to avoid pressure on adjacent materials that may bind operable parts.

E. Trim excess away for applied trim or remove as required for continuous sealant bead.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. Field inspections will be performed by Architect.

C. Inspection will include verification of insulation thickness.

3.05 PROTECTION

A. Do not permit subsequent construction work to disturb applied insulation.

3.06 SCHEDULES

A. Low Pressure Foamed-in-Place Insulation: Provide around perimeter of openings in exterior envelope including, but not limited to, windows, doors, louvers, storefront, and curtainwall systems.

B. Foamed-In-Place Insulation; Closed Cell: At junctions of dissimilar wall and roof materials and As indicated on the Drawings.

END OF SECTION 07 21 19

SECTION 07 25 00
WEATHER BARRIERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Water-Resistive Barrier: Under exterior wall cladding, over sheathing or other substrate; not air tight or vapor retardant. Location: Over exterior plywood under building cladding. Referenced on the drawings as "Building Wrap".

B. Vapor Retarders: Materials to make exterior walls, joints between exterior walls and roof, and joints around frames of openings in exterior walls water vapor resistant and air tight.

C. Air Barriers: Materials that form a system to stop passage of air through exterior walls, joints between exterior walls and roof, and joints around frames of openings in exterior walls. Location: Over exterior gypsum board within exterior wall system. Referenced on the drawings as "Weather Barrier".

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Vapor retarder under concrete slabs on grade.

B. Section 05 40 00 - Cold-Formed Metal Framing: Water-resistive barrier overexterior cladding.

C. Section 07 53 00 - Elastomeric Membrane Roofing: Vapor retarder installed as part of roofing system.

D. Section 07 62 00 - Sheet Metal Flashing and Trim: Metal flashings installed in conjunction with weather barriers.

E. Section 07 92 00 - Joint Sealants: Sealing building expansion joints.

1.03 DEFINITIONS

A. Weather Barriers: 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.

C. Vapor Retarder: Air tight barrier made of material that is relatively water vapor impermeable, to the degree specified, with sealed seams and with sealed joints to adjacent surfaces.

1.04 REFERENCE STANDARDS

A. AATCC Test Method 127 - Test Method for Water Resistance: Hydrostatic Pressure; 2018, with Editorial Revision (2019).

B. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).

C. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2021.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.

E. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.

F. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017 (Reapproved 2023).

G. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.

H. ICC-ES AC38 - Acceptance Criteria for Water-Resistive Barriers; 2016, with Editorial Revision (2021).

I. ICC-ES AC148 - Acceptance Criteria for Flexible Flashing Materials; 2017, with Editorial Revision (2021).

J. ICC-ES AC212 - Acceptance Criteria for Water-Resistive Coatings Used as Water-Resistive Barriers over Exterior Sheathing; 2015, with Editorial Revision (2020).

1.05 SUBMITTALS

A. See Section 01 30 00 - 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.

1.06 MOCK-UPS

A. Install air barrier and water-resistive barrier materials in mock-up specified in other sections .

1.07 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by materials manufacturers before, during, and after installation.

PART 2 PRODUCTS

2.01 WEATHER BARRIER ASSEMBLIES

A. Water-Resistive Barrier: Provide on exterior walls under exterior cladding.

B. Air Barrier:
   1. On outside surface of sheathing of exterior walls use air barrier coating or sheet, self-adhesive type.

2.02 AIR BARRIER MATERIALS (WATER VAPOR PERMEABLE AND WATER-RESISTIVE)

A. Air Barrier Sheet, Self-Adhered:
   1. Air Permeance: 0.004 cfm/sq ft, maximum, when tested in accordance with ASTM E2178.
   2. Water Vapor Permeance: 41 perms, minimum, when tested in accordance with ASTM E96/E96M Procedure A (desiccant procedure).
   3. Ultraviolet (UV) and Weathering Resistance: Approved in writing by manufacturer for up to 90 days of weather exposure.
   4. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less (Class A), when tested in accordance with ASTM E84.
   5. Water Resistance: Comply with applicable water-resistive requirements of ICC-ES AC38.
   6. Seam and Perimeter Tape: As recommended by sheet manufacturer.
   7. Manufacturers:
      a. Carlisle Coatings and Waterproofing, Inc; Fire Resist 705 VP: www.carlisleccw.com/#sle.
      b. Henry Company; Blueskin VP160: www.henry.com/#sle.
      c. VaproShield, LLC; WrapShield SA - Self-Adhered: www.vaproshield.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

B. Air Barrier, Fluid Applied: Vapor permeable, elastomeric waterproofing.
   1. Air Barrier Coating:
      a. Acceptable Substrates: Stated by manufacturer as suitable for installation on visibly damp surfaces and concrete that has hardened but is not fully cured ("green" concrete) without requiring a primer.
      b. Adhesion to Paper and Glass Mat Faced Sheathing: Sufficient to ensure failure due to delamination of sheathing.
      c. Dry Film Thickness (DFT): 10 mils (0.010 inch), minimum.
      d. Air Permeance: 0.004 cubic feet per minute per square foot, maximum, when tested in accordance with ASTM E2178.

e. Water Vapor Permeance: 10 perms, minimum, when tested in accordance with ASTM E96/E96M, Procedure B.
f. Ultraviolet (UV) and Weathering Resistance: Approved in writing by manufacturer for up to six months of weather exposure after application.
g. Elongation: 300 percent, minimum, when tested in accordance with ASTM D412.
h. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
i. Nail Sealability: Pass, when tested in accordance with ASTM D1970/D1970M.
j. Code Acceptance: Comply with applicable requirements of ICC-ES AC212.
k. Sealants, Tapes and Accessories: As recommended by coating manufacturer.
l. Manufacturers:
1) Carlisle Coatings and Waterproofing, Inc; Fire Resist Barritech-VP: www.carlisleccw.com/sle.
2) Henry Company; Air-Bloc 33MR: www.henry.com.
3) W.R. Meadows, Inc; Air-Shield TMP: www.wrmeadows.com/#sle.
4) _____.

2. Air Barrier , Fluid Applied: Vapor permeable, elastomeric waterproofing:
a. Material: Water-based.
b. Acceptable Substrates: Stated by manufacturer as suitable for installation on visibly damp surfaces and concrete that has hardened but is not fully cured ("green" concrete) without requiring a primer.
c. Adhesion to Paper and Glass Mat Faced Sheathing: Sufficient to ensure failure due to delamination of sheathing.
d. Dry Film Thickness (DFT): 30 mil, 0.030 inch, minimum.
e. Ultraviolet (UV) and Weathering Resistance: Approved in writing by manufacturer for up to three months of weather exposure.
f. Elongation: 300 percent, minimum, when tested in accordance with ASTM D412.
g. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
h. Nail Sealability: Pass, when tested in accordance with ASTM D1970/D1970M.
i. Code Acceptance: Comply with applicable requirements of ICC-ES AC212.
j. Sealants, Tapes and Accessories: As recommended by coating manufacturer.
k. Manufacturers:
1) Carlisle Coatings and Waterproofing, Inc; Fire Resist Barritech-VP: www.carlisleccw.com/#sle.
2) Henry Company; Air-Bloc 33MR: www.henry.com/#sle.
3) W.R. Meadows, Inc; Air-Shield LMP: www.wrmeadows.com/#sle.

2.03 ACCESSORIES

A. Sealants, Tapes, and Accessories Used for Sealing Water-Resistive Barrier and Adjacent Substrates: As indicated or complying with water-resistive barrier manufacturer's installation instructions.

B. Flexible Flashing: Self-adhering or mechanically attached flashing used for wall penetrations in accordance with ICC-ES AC148 requirements.

C. Preformed Transition Membrane: Semi-rigid silicone or polyester composition, tapered edges, and tear resistant.

D. Liquid Flashing: One part, fast curing, nonsag, elastomeric, gun grade, trowelable liquid flashing.

E. Thinners and Cleaners: As recommended by water-resistive barrier manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and conditions comply with requirements of this section.

3.02 PREPARATION

A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.

B. Clean and prime substrate surfaces to receive adhesives and sealants in accordance with manufacturer's installation instructions.

3.03 INSTALLATION

A. Install materials in accordance with manufacturer's installation instructions.

B. Air Barriers: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.

C. Apply sealants and adhesives within recommended temperature range in accordance with manufacturer's installation instructions.

D. Self-Adhered Sheets:
   1. Prepare substrate in accordance with sheet manufacturer's installation instructions; fill and tape joints in substrate and between dissimilar materials.
   2. Lap sheets shingle-fashion to shed water and seal laps airtight.
   3. Upon placement of sheets, firmly press onto substrate with resilient hand roller; ensure that laps are firmly adhered with no gaps or fishmouths.
   4. Use same material, or other material approved by sheet manufacturer, to seal sheets to adjacent substrates, and as flashing.
   5. At expansion joints, provide transition to joint assemblies approved by sheet manufacturer.

E. Coatings:
   1. Prepare substrate in accordance with coating manufacturer's installation instructions; treat joints in substrate and between dissimilar materials as indicated.
   2. Where exterior masonry veneer is being applied, install masonry anchors prior to placement of water-resistive barrier over masonry substrate; seal airtight around anchors.
   3. Apply bead or trowel coat of mastic sealant with minimum thickness of 1/4 inch along coating seams, rough cuts, and as recommended by manufacturer.
   4. Apply flashing to seal with adjacent construction and to bridge joints in coating substrate.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. Owner’s Inspection and Testing: Cooperate with Owner’s testing agency.
   1. Allow access to work areas and staging.
   2. Notify Owner’s testing agency in writing of schedule for work of this section to allow sufficient time for testing and inspection.
   3. Do not cover work of this section until testing and inspection is accepted.

C. Coordination of ABAA Tests and Inspections:

D. Do not cover installed water-resistive barriers until required inspections have been completed.

E. Obtain approval of installation procedures from water-resistive barrier manufacturer based on a mock-up installed in place, prior to proceeding with remainder of installation.

F. Take digital photographs of each portion of installation prior to covering up weather barriers.

3.05 PROTECTION

A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION 07 25 00

SECTION 07 42 13.23
METAL COMPOSITE MATERIAL WALL PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Exterior cladding consisting of formed metal composite material (MCM) sheet, secondary supports, and anchors to structure, attached to solid backup.

B. Matching flashing and trim.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Installation of anchors.

B. Section 04 20 00 - Unit Masonry: Installation of anchors.

C. Section 05 40 00 - Cold-Formed Metal Framing: Panel support framing.

D. Section 07 25 00 - Weather Barriers: Water-resistive barrier behind wall panel system.

E. Section 07 62 00 - Sheet Metal Flashing and Trim: Metal flashing components integrated with this wall system.

F. Section 07 92 00 - Joint Sealants: Sealing joints between panels and adjacent construction and fixtures.

1.03 REFERENCE STANDARDS

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

B. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.

E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

F. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2025.

G. ASTM A480/A480M - Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip; 2023b.

H. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

I. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

J. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2023.

K. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

L. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

M. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.

N. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

O. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

P. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).

Q. ASTM D523 - Standard Test Method for Specular Gloss; 2014 (Reapproved 2018).

R. ASTM D1781 - Standard Test Method for Climbing Drum Peel for Adhesives; 1998 (Reapproved 2021).

S. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics; 2023.

T. ASTM D2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates; 2023.

U. ASTM D4145 - Standard Test Method for Coating Flexibility of Prepainted Sheet; 2010 (Reapproved 2022).

V. ASTM D4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films; 2023.

W. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.

X. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.

Y. 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).

Z. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Meeting: Convene one week before starting work of this section to verify project requirements, coordinate with installers of other work, establish condition and completeness of building substrate, and review manufacturers' installation instructions and warranty requirements.
   1. Require attendance by the installer and relevant sub-contractors.
   2. Include MCM sheet manufacturer’s representative and wall system manufacturer’s representative to review storage and handling procedures.
   3. Review in detail truck transportation, parking, vertical transportation, schedule, personnel, installation of adjacent materials and substrate.
   4. Review procedures for protection of work and other construction.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data - Wall System: Manufacturer's data sheets on each product to be used, including:
   1. MCM sheets including thickness, physical characteristics, and finish.
   2. Finish manufacturer's data sheet showing physical and performance characteristics.
   3. Physical characteristics of components shown on shop drawings.
   4. Storage and handling requirements and recommendations.
   5. Installation instructions and recommendations.
   6. Specimen warranty for wall system, as specified herein.

C. Shop Drawings: Show layout and elevations, dimensions and thickness of panels, connections, details and location of joints, sealants and gaskets, method of anchorage, number of anchors, supports, reinforcement, trim, flashings, and accessories.
   1. Indicate panel numbering system.

2. Differentiate between shop and field fabrication.
3. Indicate substrates and adjacent work with which the wall system must be coordinated.
4. Include large-scale details of anchorages and connecting elements.
5. Include large-scale details or schematic, exploded or isometric diagrams to fully explain flashing at a scale of not less than 1-1/2 inches per 12 inches.
6. Include design engineer's stamp or seal on shop drawings for attachments and anchors.

D. Selection Samples: Submit manufacturer's printed literature identifying all standard and premium colors/finishes available for initial color selection.

E. Selection Samples: Submit 3 x 5 inch samples of manufacturer's standard and premium colors/finishes for initial color selection. Allow for up to five samples.

F. Verification Samples: Submit two samples of each panel, 12 by 12 inch in size illustrating finish color, sheen, and texture.

G. Design Data: Submit structural calculations stamped by design engineer, for Architect's information and project record.

H. Test Report: Submit report of full-size mock-up tests for air infiltration, water penetration, and wind performance.

I. Manufacturer's Field Reports: Provide within 48 hours of field review. State what was observed and what changes, if any, were requested or required.

J. Installer's qualification statement.

K. Testing agency's qualification statement.

L. Maintenance Data: Care of finishes and warranty requirements.

M. Executed Warranty: Submit warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Field Measurements: Verify actual dimensions by field measurement before fabrication; show recorded measurements on shop drawings.

B. Design Engineer's Qualifications: Design structural supports and anchorages under direct supervision of a Structural Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

C. Manufacturer Qualifications: Company specializing in manufacturing wall panel systems specified in this section.
1. With not less than five years of documented experience.
2. Approved by MCM sheet manufacturer.

D. Installer Qualifications: Company specializing in performing work of type specified in this section.
1. With minimum five years of documented experience.
2. Approved by wall panel system manufacturer.

E. Testing Agency Qualifications: Independent agency experienced in testing assemblies of the type required for this project and having the necessary facilities for full-size mock-up testing of the type specified.

F. Mock-Up: Provide a mock-up for evaluation of fabrication workmanship.
1. Locate where directed.
2. Provide panels finished as specified.
3. Mock-up may remain as part of the Work.

1.07 MOCK-UPS

A. Mock-up may remain as part of work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer's original, unopened, undamaged containers with identification labels intact.
   1. Protect finishes by applying heavy-duty removable plastic film during production.
   2. Package for protection against transportation damage.
   3. Provide markings to identify components consistently with drawings.
   4. Exercise care in unloading, storing, and installing panels to prevent bending, warping, twisting, and surface damage.

B. Store products protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
   1. Store in well-ventilated space out of direct sunlight.
   2. Protect from moisture and condensation with tarpaulins or other suitable weathertight covering installed to provide ventilation.
   3. Store at a slope to ensure positive drainage of accumulated water.
   4. Do not store in enclosed space where ambient temperature can exceed 120 degrees F.
   5. Avoid contact with other materials that might cause staining, denting, or other surface damage.

1.09 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Panel System Warranty: Provide joint written warranty by manufacturer and installer, agreeing to correct defects in manufacturing or installation within a five year period after Date of Substantial Completion.

C. MCM Sheet Manufacturer’s Finish Warranty: Provide manufacturer's written warranty stating that the finish will perform as follows for minimum of 20 years:
   1. Chalking: No more than that represented by a No. 8 rating based on ASTM D4214.
   2. Color Retention: No fading or color change in excess of 5 Hunter color difference units, calculated in accordance with ASTM D2244.
   3. Gloss Retention: Minimum of 30 percent gloss retention, when tested in accordance with ASTM D523.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Composite Material (MCM) Sheet Manufacturer Basis of Design:
   1. ALPOLIC Materials; ALPOLIC/fr (Fire Retardant core): www.alpolic-americas.com/#sle.

B. Other Acceptable Metal Composite Material (MCM) Sheet Manufacturers:
   1. ALUCOBOND USA; ALUCOBOND PLUS: www.alucobondusa.com/#sle.
   2. Citadel Architectural Products, Inc; Envelope 2000: www.citadelap.com/#sle.
   3. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 WALL PANEL SYSTEM

A. Wall Panel System: Metal panels, fasteners, and anchors designed to be supported by framing or other substrate provided by others; provide installed panel system capable of maintaining specified performance without defects, damage or failure.
   1. Provide structural design by or under direct supervision of a Structural Engineer licensed in the State in which the Project is located.
   2. Provide panel jointing and weatherseal using reveal joints and gaskets but no sealant.
   3. Anchor panels to supporting framing without exposed fasteners.

2.03 PERFORMANCE REQUIREMENTS

A. Rainscreen (Cavity Wall) System:
   1. Wall panel assembly shall be designed in accordance with manufacturer's guidelines to allow air movement behind the panels as well as providing weep holes and channels

through which any incidental moisture that enters the system can escape, thus providing a rainscreen (cavity wall) system.

B. Thermal Movement: Provide for free and noiseless vertical and horizontal thermal movement due to expansion and contraction under material temperature range of minus 20 degrees F to 180 degrees F without buckling, opening of joints, undue stress on fasteners, or other detrimental effects; allow for ambient temperature at time of fabrication, assembly, and erection procedures.

C. Air Leakage: 0.10 cfm/sq ft maximum leakage when tested at 1.57 psf pressure difference in accordance with ASTM E283/E283M.

D. Water Penetration: No water penetration under static pressure when tested in accordance with ASTM E331 at a differential of 10 percent of inward acting design load, 6.27 psf minimum, after 15 minutes.
   1. Water penetration is defined as the appearance of uncontrolled water on the interior face of the wall.
   2. Design to drain leakage and condensation to the exterior face of the wall.

E. Building Envelope Performance: Comply with ASHRAE Std 90.1 I-P when tested as part of building envelope assembly.

2.04 PANELS

A. Panels: 1 inch deep pans formed of metal composite material sheet by routing back edges of sheet, removing corners, and folding edges.
   1. Reinforce corners with riveted aluminum angles.
      a. Make panel lines, breaks, curves, and angles sharp and true.
      b. Keep plane surfaces free from warp or buckle.
      c. Keep panel surfaces free of scratches or marks caused during fabrication.

2.05 MATERIALS

A. Metal Composite Material (MCM) Sheet: Two sheets of aluminum sandwiching a core of extruded thermoplastic material; no foamed insulation material content.
   1. Overall Sheet Thickness: 0.157 inch, minimum.
   2. Face Sheet Thickness: 0.024 inches, minimum.
   3. Bond and Peel Strength: No adhesive failure of the bond between the core and the skin nor cohesive failure of the core itself below 22.4 inch-pound/inch with no degradation in bond performance, when tested in accordance with ASTM D1781, simulating resistance to panel delamination, after 8 hours of submersion in boiling water and after 21 days of immersion in water at 70 degrees F.
   4. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
   5. Flammability: Self-ignition temperature of 650 degrees F or greater when tested in accordance with ASTM D1929.
   6. Base Bid Factory Finish: One coat fluoropolymer resin coating, approved by the coating manufacturer for the length of warranty specified for the project, and applied by coil manufacturing facility that specializes in coil applied finishes.
   7. Factory Finish: Fluoropolymer resin coating, approved by the coating manufacturer for the length of warranty specified for the project, and applied by coil manufacturing facility that specializes in coil applied finishes.
      a. 1.0 mil. Fluropolymer (PVDF) Two Coat system: 0.2 mil primer with 0.8 mil Kynar 500 (70 percent) SOLID color coat.
      b. Coating Flexibility: Pass ASTM D4145 minimum 1T-bend, at time of manufacturing.
      c. Long-Term Performance: Not less than that specified under WARRANTY in PART 1.
   8. Color/Texture: To be selected from the manufacturer's full line of all standard and premium colors, in all price groups excluding metallics containing MICA flakes.

B. Installation System:

1. Reveal (RV) System: Field-assembled manufacturer's installation system consisting of metal composite material (MCM), trim moldings, silicone sealant, and accessories to provide a barrier system.
2. Color: To match panel colors.

C. Metal Framing Members: Include thermally broken sub-girts, zee-clips, base and sill angles and channels, hat-shaped and rigid channels, and furring channels required for complete installation.
1. Provide material strength, dimensions, configuration as required to meet applied loads and in compliance with applicable building code.
2. Sheet Steel Components: ASTM A653/A653M galvanized to G90/Z275 or zinc-iron alloy-coated to A60/ZF180; or ASTM A792/A792M aluminum-zinc coated to AZ60/AZM180.
3. Stainless Steel Sheet Components: ASTM A480/A480M.
4. Aluminum Components: ASTM B209/B209M; or ASTM B221 (ASTM B221M).

2.06 FINISHES

A. Factory Finish: Two coat fluoropolymer resin coating, approved by coating manufacturer for length of warranty specified for project, and applied by coil manufacturing facility that specializes in coil applied finishes.
1. Coating Flexibility: Pass ASTM D4145 minimum 1T Bend at time of manufacturing.
2. Long-Term Performance: Not less than that specified under WARRANTY in PART 1.

2.07 ACCESSORIES

A. Flashing: Sheet aluminum; 0.040 inch thick, minimum; finish and color to match MCM sheet; see Section 07 62 00 for additional requirements.

B. Anchors, Clips, and Accessories: Use one of the following:
1. Stainless steel complying with ASTM A276/A276M, ASTM A480/A480M, or ASTM A666/A666M.
2. Steel complying with ASTM A36/A36M and hot-dip zinc coating to ASTM A153/A153M.
3. Steel complying with ASTM A36/A36M and hot-dip galvanized to ASTM A123/A123M, with Coating Thickness Grade of 100.

C. Joint Sealer: Provide color to match wall panels silicone sealant of type approved by MCM sheet manufacturer, and in compliance with ASTM C920.

D. Provide panel system manufacturer's and installer’s stainless steel accessories, including fasteners, clips, anchorage devices and attachments.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine dimensions, tolerances, and interfaces with other work.
1. Verify that weather barrier system is properly installed; see Section 07 25 00 for requirements.

B. Examine substrate on-site to determine that conditions are acceptable for product installation in accordance with manufacturer's written instructions.

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

D. Notify Architect in writing of conditions detrimental to proper and timely completion of work, and do not proceed with erection until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Protect adjacent work areas and finish surfaces from damage during installation.

3.03 INSTALLATION

A. Do not install products that are defective, including warped, bowed, dented, and broken members, and members with damaged finishes.

B. Comply with instructions and recommendations of MCM sheet manufacturer and wall system manufacturer, as well as with approved shop drawings.

C. Install wall system securely allowing for necessary thermal and structural movement; comply with wall system manufacturer's instructions for installation of concealed fasteners.

D. Do not handle or tool products during erection in manner that damages finish, decreases strength, or results in visual imperfection or failure in performance. Return component parts that require alteration to shop for refabrication, if possible, or for replacement with new parts.

E. Do not form panels in field unless required by wall system manufacturer and approved by the Architect; comply with MCM sheet manufacturer's instructions and recommendations for field forming.

F. Separate dissimilar metals; use gasket fasteners, isolation shims, or isolation tape where needed to eliminate possibility of electrolytic action between metals.

G. Install flashings as indicated on shop drawings. At flashing butt joints, provide a lap strap under flashing and seal lapped surfaces with a full bed of non-hardening sealant.

H. Install square, plumb, straight, and true, accurately fitted, with tight joints and intersections maintaining the following installation tolerances:
   1. Variation From Plane or Location: 1/2 inch in 30 feet of length and up to 3/4 inch in 300 feet, maximum.
   2. Deviation of Vertical Member From True Line: 0.1 inch in 25 feet run, maximum.
   3. Deviation of Horizontal Member From True Line: 0.1 inch in 25 feet run, maximum.
   4. Offset From True Alignment Between Two Adjacent Members Abutting End To End, In Line: 0.03 inch, maximum.

I. Replace damaged products until Substantial Completion.
   1. Exception: Field repairs of minor damage to finishes are permitted only when approved in writing by Architect, panel manufacturer, and fabricator.
   2. Field Repairs to Finishes: Using materials and methods sufficient that repairs are not discernible when viewed at distance of 10 feet under all typical light conditions experienced at the project.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. Wall System Manufacturer's Field Services: Provide field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with instructions.

C. Site Visits: Schedule two site visits during execution of installation.

3.05 CLEANING

A. Ensure weep holes and drainage channels are unobstructed and free of dirt and sealants.

B. Remove protective film after installation of joint sealers, after cleaning of adjacent materials, and immediately prior to completion of work.

C. Remove temporary coverings and protection of adjacent work areas.

D. Clean installed products in accordance with manufacturer's instructions.

3.06 PROTECTION

A. Protect installed panel system from damage until Date of Substantial Completion.

B. Remove and replace damaged panels and/or components until Date of Substantial Completion.

END OF SECTION 07 42 13.23

SECTION 07 53 10
SINGLE PLY ROOFING-FULLY ADHERED EPDM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Substrate: Covering over metal deck and vapor retarder.

B. Vapor retarder. Self-Adhered and 2-ply

C. Insulation

D. Cover Board.

E. EPDM Membrane roofing, base flashings, roof expansion joints, and all accessories and appurtenances for a complete system.

1.02 REFERENCE STANDARDS

A. ASCE 7-16 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; 2016.

B. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board; 2022.

C. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2025.

D. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).

E. ASTM D471 - Standard Test Method for Rubber Property--Effect of Liquids; 2016a (Reapproved 2021).

F. ASTM D624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers; 2000 (Reapproved 2020).

G. ASTM D746 - Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact; 2024.

H. ASTM D1004 - Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting; 2021.

I. ASTM D1149 - Standard Test Methods for Rubber Deterioration-Cracking in an Ozone Controlled Environment; 2018 (Reapproved 2025).

J. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 Degrees C; 2024c.

K. FM 4470 - Examination Standard for Single-Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof (BUR) and Liquid Applied Roof Assemblies for Use in Class 1 and Noncombustible Roof Deck Construction; 2022.

L. UL 790 - Standard for Standard Test Methods for Fire Tests of Roof Coverings; Current Edition, Including All Revisions.

1.03 RELATED SECTIONS

A. Section 06 11 40 - Wood Blocking and Curbing.

B. Section 07 01 50 - Preparation for Re-Roofing.

C. Section 07 62 10 - Sheet Metal Flashing and Trim

D. Section 07 72 00 - Roof Accessories

E. Section 07 72 10 - Roof Ladders and Hatches

1.04 REFERENCES

A. ASTM C 1177/C 1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2001.

B. ASTM C208 - Insulating Board (Cellulosic Fiber) Structural and Decorative (High Density Wood Fiberboard).

C. ASTM C1289-01 - Class I Grade II - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board

D. ASTM D412 - Rubber Properties in Tension.

E. ASTM D471 - Standard Test Method for Rubber Property - Effect of Liquids.

F. ASTM D624 - Rubber Property - Tear Resistance.

G. ASTM D746 - Brittleness Temperature of Plastics and Elastomeric by Impact.

H. FTM D822 - Practice for Operating Light and Water Exposure Apparatus (Carbon-Arc) Type for Testing Paint, Varnish, Lacquer, and Related Products.

I. ASTM D1004 - Initial Tear Resistance of Plastic Film and Sheeting.

J. ASTM E96 - Water Vapor Transmission of Materials.

K. E108 - Standard Test Methods for Fire Tests of Roof Coverings

L. E119 - Standard Test Methods for Fire Tests of Building Construction and Materials

M. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 1301 degrees Fahrenheit.

N. FM 4470 (Factory Mutual Engineering Corporation) - Roof Assembly Classifications.

O. NCRA (National Roofing Contractors Association) - Roofing and Waterproofing Manual, latest edition.

P. UL (Underwriters' Laboratories) 790 - Fire Hazard Classifications.

Q. SMACNA - Sheet metal and Air Conditioning Contractor's Association: Architectural Sheet Metal Manual, latest edition.

R. ASCE 7-22

1.05 SYSTEM DESCRIPTION

A. Elastomeric Sheet Membrane EPDM Roofing System: Fully adhered 60 mil Black EPDM single ply membrane roofing and flashing with vapor retarder, insulation, cover board, and all accessories and appurtenances for a complete system.

1.06 SUBMITTALS

A. Section 00 13 00 - Administrative Requirements: Procedures for submittals.

B. Submit Manufactures Assembly Letter
   1. Letter to included statement that roof system has is eligible for the 20-year warranty with a 72 MPH 3 second peak gust wind speed
   2. Construction - New or tear off
   3. Slope and deck type
   4. Each layers attachment (adhesive of screws) and Rate for Zone 1 (field), Zone 2(perimeter) and Zone 3(corners)

C. Submit written certification that the roofing contractor/subcontractor has been an approved applicator of selected roof system for 5 years or more.

D. Submit written certification from the proposed EPDM manufacturer that all appropriate warranty paper work has been submitted prior to starting the work.

E. Submit written certification from insulation manufacturer that their insulation is compatible with the proposed EPDM .

F. Submit written certification and/or documentation that the foreman and/or crew members have attended the proposed SPM manufacturer's training seminar.

G. Submit written certification from roofing system manufacturer that proposed insulation faces are compatible with proposed single ply membranes.

H. Submit written certification from roofing system manufacturer that all details indicated in the drawings are acceptable to the roofing system manufacturer.

I. Submit written certification from roofing system manufacturer that all products and labor to install same, including the vapor retarder system being installed in the roof system, are covered under the full system warranty.

J. Product Data: Provide characteristics on membrane materials, flashing materials, insulation, adhesive and all products to be installed as part of roofing system.
   1. Material safety and technical information data sheets for all roofing system components.
   2. Insulation
      a. Polyisocyanurate
      b. Composite HD Polyisocyanurate.
   3. EPDM
      a. Membrane
      b. Self adhering flashing.
      c. Adhesives
      d. Seam Tape
      e. EPDM lap sealant
      f. Water cut off mastic
   4. Mechanical Fasteners:
      a. Nails
      b. Screw Fasteners
   5. EPDM manufacturer's specification and instruction manual for all components of roofing system.
   6. Warranty: Sample copy of manufacturer's 20 year full roof system warranty.
   7. 2'-6" x 2'-6" Rubber walkway pads.
   8. Vapor Retarder Materials
   9. HD Cover Board.
   10. Substrate board

K. Shop Drawings:
   1. Submit shop drawings to the roofing system manufacturer for approval.
   2. Submit Manufacturer approved shop drawings to the Architect. Shop drawings shall exhibit compliance with standards and detailing as specified herein or as indicated in the drawings.
   3. Minimum scale: 3" = 1'-0", except where otherwise specified. Manufacturer's standard details are unacceptable.
   4. Submit:
      a. Base flashing:
         1) Utilizing field ply EPDM as base flashing
         2) Utilizing reinforced EPDM strip
      b. Parapet Roof edge with coping.
      c. Mechanical/electrical equipment curbs.
      d. Roof plumbing vents.
      e. Roof drains showing appropriate extensions rings.
      f. Pipe penetration.
      g. Gutter roof edge.
      h. Expansion joints.
      i. Pipe Penetrations.
      j. Eave roof edge.
      k. Overflow scupper detail
      l. Base conditions at mechanical penthouse
      m. Roof plan/insulation layout:
         1) Tapered insulation layout minimum scale 1/8" = 1'-0".

2) Indicate all roof curbs, penetrations, required saddles, and crickets.
3) NO FLAT SUMPS AT DRAINS PERMITTED.

n. Roof plan with proposed lap seam layout.

L. Samples: Submit 1 manufacturer's samples of the following: If requested by the Architect
1. Insulation:
a. Polyisocyanurate 3 pieces
b. Cover board.
2. Self Adhering Vapor Retarder.
3. EPDM: 60 Mil.
4. Semi cured self adhering EPDM cover strip.
5. SPDM Corner: Premolded, semi-cured self adhering.
6. Seam Tape.
7. Fasteners, as indicated on the drawings:
a. Nails
b. Screw fasteners w/stress plates
8. 1/8 x 1 inch aluminum termination bar
9. Rubber walkway pad
10. Premolded Pipe Boots: One of Each Size Required.
11. Dens-Deck Prime

1.07 SUBMITTALS FOR INFORMATION

A. Section 01 30 00 - Administrative Requirements: Procedures for submittals.

B. Manufacturer's Installation Instructions: Indicate special precautions required for seaming the membrane.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

D. Reports: Indicate procedures followed; ambient temperatures, humidity, wind velocity during application, work in progress and observations .

1.08 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing the products specified in this section with five years documented experience.

B. Applicator/ Roofing Contractor must:
1. Specialize in performing the work of this section with five continuous years documented experience as an approved applicator of one of the specified manufacturer's under the same company name.
2. Have all crew members trained by the SPM manufacturer in the installation of their system. Written certification of same must be forwarded upon request.

C. Have performed work in accordance with current published manufacturer's instructions and recommendations.

1.09 REGULATORY REQUIREMENTS

A. Conform to applicable code for roof assembly fire hazard requirements.

B. UL 790: Class A Fire Hazard Classification.

C. Roof Assembly Classification of Class 1 Construction, The roofing manufacturer for all systems listed must present written evidence the roofing system is Class A fire rated and shall meet uplift require for wind speeds of 90 mph. (or higher as required by Code) The roofing Contractor shall provide a 72 mph manufactures extended wind speed coverage warranty

1.10 PRE-INSTALLATION MEETING

A. Section 01 30 00 - Administrative Requirements: Pre-Installation meeting.

B. Convene no less than one week before starting work of this section.

C. Roof Foreman and Superintendent for this project - MUST BE IN ATTENDANCE.

1.11 DELIVERY, STORAGE, AND PROTECTION

A. Section 01 60 00 - Product Requirements: Transport, handle, store, and protect products.

B. All materials shall be new.

C. Store products on clean raised pallets in weather protected environment, clear of ground and moisture per manufacturer's recommendations.

D. Deliver all materials in manufacturer's original, unopened containers and rolls with all labels intact and legible.

E. Deliver materials requiring fire resistance classification packaged with labels attached as required by the labeling service.

F. Deliver materials in sufficient time and quality to allow continuity of work and compliance with approved construction schedule.

G. Store rolled goods on end and handle rolled goods in manner to prevent damage to edges or ends.

H. Provide continuous protection of materials against damage or deterioration.

I. Remove damaged or defective materials from site.

J. Roof Insulation:
   1. Store insulation on clean, raised platforms, remove manufacturer's wrappings and cover with breathable, waterproof weather protective coverings.
   2. Provide continuous protection of insulation materials against wetting and moisture absorption.
   3. Remove wet insulation materials from the project site.
   4. Once insulation becomes wet, it will be removed from the site and not used. Wet insulation which then dries shall be removed from the site, the same as wet insulation.

K. Comply with fire and safety regulations.

L. EPDM splice cleaner to be contained in UL approved safety cans at all times.

M. All materials shall be new.

N. Do not store material or park vehicles/dumpsters in front of doors.

O. No materials shall be stored on any new or existing roofing system.

1.12 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.

B. Do not apply EPDM roofing membrane during inclement weather and/or ambient temperatures below 20 degrees Fahrenheit or above 95 degrees Fahrenheit.

C. Do not apply roofing membrane to damp or frozen deck surface.

D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

E. All EPDM lap sealants mastics and adhesives must be kept at 60 degrees Fahrenheit prior to installation when the ambient temperature falls below 40 degrees.

F. Do not install roofing materials when vapor retarder is damp, frost covered or wet.

1.13 COORDINATION

A. Coordinate work under provisions of Section 01 30 00.

B. Coordinate the work with the installation of trades whose impinges on the roofing and of associated metal flashings, as the work of this section proceeds.

1.14 PROTECTION

A. Avoid repeated foot traffic and use of heavy equipment over completed roofing.

B. Restore to original condition or replace all the work or materials damaged by roofing operations.

C. Repair any damage to existing conditions caused by work of this section.

D. Remove protection upon completion of the roofing work.

1.15 WARRANTY AND CLOSEOUT DOCUMENTS

A. Refer to Section 01 70 00 - Closeout Submittals for additional information.

B. Correct defective work within a two year period after Substantial Completion for damage to building resulting from failure to prevent penetration of water.

C. The roofing manufacturer for all systems listed must present written evidence the roofing system is Class A fire rated and shall meet uplift require for wind speeds of 90 mph. (or higher as required by Code) The roofing Contractor shall provide a 72 mph manufactures extended wind speed coverage warranty

D. General Contractor / Roofing Contractor: To provide manufacturer's 20 year No Dollar Limit (NDL) total roofing system warranty guaranteeing the materials manufacturer will pay for repairs to stop the leaks resulting from the natural deterioration of the roof system assembly or from any errors in application of the roof system assembly. Wind uplift requirement of 1-90
   1. Carlisle Golden Seal Total Roofing System Warranty with limited Hail Coverage: WA-F0015 (10/02)
   2. Elevate Red Shield Platinum Roofing System and Damage Repair Limited Warranty.
   3. Manville Roofing Systems Gold Shield Roofing System Guarantee: October 1994; SI-645-2 (10/94).
   4. Warranty shall include all vapor retarder, insulation and cover board components and the labor to install same.

E. General Contractor / Roofing Contractor shall include sheet metal as part of the roofing membrane full system edge to edge warranty

F. The guarantee shall start from the day of Final Inspection by the Architect and a "PASS" warranty inspection by the manufacturer's representative. The date shall be established as the date the Architect and the manufacturer's representative inspect the work and find that all work is complete in accordance with the Contract Documents and the manufacturer's printed instructions, and forms a watertight installation.

G. The roofing contractor shall notify the Architect in writing when the roof is complete for final inspection.

H. Warranty Inspection: The roofing contractor shall notify the Architect in writing when the roof system material manufacturer will conduct their warranty inspection.
   1. Copy of Warranty Inspection Checklist report shall be forwarded to the Architect.

I. Completed Operations Inspection:
   1. Upon completion of installation of EPDM roof system, an inspection of the entire roof system shall be made by Contractor to determine compliance with manufacturer's requirements. Submit written notice of same in accord with Section 01 70 00.
   2. Upon completion of installation of EPDM roof system, Manufacturer shall certify in writing to the Architect, that materials, workmanship, and installation were in accordance with the manufacturer's printed instructions and current recommendations.

J. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS- MEMBRANE MATERIAL

A. Holcim Elevate, 26 Century Blvd., Suite 205, Nashville, TN 37214 Phone

B. Manville Roofing Systems, P.O. Box 5108, Denver, CO 80217-5108

C. Carlisle Syntec Incorporated, P.O. Box 7000, Carlisle, PA 1701 Phone: 800-4-SYNTEC.

D. Versico Roofing Systems, 3485 Fortuna Dr, Akron Ohio Phone 800-992-7663

E. Section 01 60 00 - Materials and Equipment: Product options.

F. Substitutions: See section 016000 - Product Requirements

2.02 MEMBRANE AND ASSOCIATED MATERIALS

A. Membrane: EPDM Non-reinforced, 60 Mil thick, BLACK

	Properties	Test	Pass Test
1.	Tensile Strength	ASTM D412	1305 psi
2.	Elongation	ASTM D412	350%
3.	Tear Strength	ASTM D624 Die C	175#/in.
4.	Water Absorption	ASTM E96	0.1 perms
5.	Moisture Vapor Perms	ASTM E96	0.1 perms
6.	Resistant to Outdoor Weathering	ASTM D22	No cracks- No crazing
7.	Low Temperature Brittleness	ASTM D746	-75 degrees Fahrenheit.
8.	Ozone Resistance	ASTM D1149	No cracks

B. Seaming Materials: As recommended by membrane manufacturer.

2.03 ADHESIVE MATERIALS

A. Surface Conditioner: Compatible with membrane, as recommended by membrane manufacturer.

B. Membrane Adhesives: As recommended by membrane manufacturer.

C. Insulation Adhesive: As recommended by insulation manufacturer.

D. Thinner and Cleaner: As recommended by adhesive manufacturer, compatible with sheet membrane.

2.04 COVER / SUBSTRATE BOARD

A. HD Insulation Roof Cover Board: 1/2 inch thickness, Elevate ISOGARD HD or equal.

B. Dens Deck Prime Substrate Board: 1/2 inch thickness. Or manufacturer's equal

2.05 INSULATION

A. Manufacturers:
1. Carlisle Syntec Incorporated.
2. Holcim Elevate.
3. Manville Roofing Products.
4. Versico Roofing Systems
5. Section 01 60 00 - Product Requirements: Product options.
6. Substitutions: See section 01 60 00 Product Requirements

B. Polyisocyanurate foam panels shall be HCFC free and formulated with hydrocarbon blowing agents chemically bonded during the foaming process to facers on top and bottom surfaces.
1. Flat Insulation: Flat rigid board conforming to ASTM C1289 -01 Type II, Class I, Grade II, UL 1256 No. 120 and 123, UL 790 (((ASTM E108))) Class A, Ul 263 (((ASTM E119))) FM 4450 / 4470 Class I fire rating, polyisocyanurate rigid board, both faces surfaced with fiber reinforced faces, with the following characteristics:
   a. Board Density: 2.0 lb/cu ft
   b. Board Size: 4'-0" x 4'-0"
   c. Board Thickness: 3" or as required to achieve R-34. Must be in two layers of insulation
   d. Thermal Conductivity: LTTR value of 5.6/inch per ASTM C1303.
   e. Board Compressive Resistance: 20 psi min. PER astm D 1621
   f. Board Edges: Square
2. Tapered Insulation: Conforming to ASTM C1289 -01 Type II, Class I, Grade II, UL 1256 No. 120 and 123, UL 790 (((ASTM E108))) Class A, Ul 263 (((ASTM E119))) FM 4450 /

4470 Class I fire rating, polyisocyanurate rigid board, both faces surfaced with fiber reinforced faces, with the following characteristics:

a. Board Density 2.0 lb/cu ft
b. Board Size 4'-0" x 4'-0"
c. Board Taper Beginning thickness 1/2", 3/16" and 1/2 inch/ft and 1/4 inch/ ft slope.
d. Thermal Conductivity Aged R value of 5.6/inch as per ASTM C1303.
e. Board Edges Square
f. Board Compressive Resistance 20 psi min.per ASTM D 1621

C. HD Composite Board can be provided for areas where no saddles exist. HD Cover board will need to be provided over insulation at all saddles and crickets.

2.06 VAPOR RETARDER

A. Self Adhering Vapor Retarder; Over substrate board or existing concrete deck. Elevate V-Force Vapor Barrier Membrane self-adhering vapor retarder or manufacturers equal.

B. 2-Ply Vapor Retarder: Over new precast deck Elevatye MB Base - Torch Applied. Cap Sheet: SBS Glass Torch Base. Or manufacturers equal.

2.07 FLASHINGS

A. Flexible Flashings: Same material as membrane.

B. EPDM Self-Adhering, Semi-cured, various widths required.

C. EPDM Corners: Self-adhering, premolded, semi-cured; inside and outside.

D. Copings, Fascias, Counterflashings and Misc. Sheet Metal: As specified in Section 07 62 10.

E. Control or Expansion Joint Flashing: As detailed and as specified in Section 07 62 10.

2.08 ACCESSORIES

A. Tapered Edge Strips: High density wood fiber, compatible with EPDM tapered edge strip manufactured configuration as detailed Provided by EPDM membrane manufacturer.

B. Seam Tape: 3"

C. Lap Seam Cover Strips: 5" minimum widths, semi-cured, self adhering EPDM as supplied by the roof system manufacturer.

D. EPDM Lap Sealant: As provided by membrane manufacturer.

E. Cover Strips: 5 inch minimum widths semi-cured self adhering EPDM as supplied by roof system manufacturer and provided by contractor.

F. Roofing Nails: Ring shank aluminum, size as required to suit application with 1" plastic washer heads.

G. Insulation Fasteners: Appropriate for purpose intended and approved by system manufacturer; length required for thickness of material with metal washers; manufactured by EPDM manufacturer. Screw Fasteners to have buttress heads.

H. Silicone Sealants: As recommended by membrane manufacturer.

I. Walkway Pads: 2'-6" x 2'-6" EPDM QuickSeam Walkway Pads, Firestone or manufacturers equal.

J. EPDM Manufacturers Water Cut-Off Mastic: Provide as needed to sheet metal manufacturer.

K. Foam Adhesive: Low rise ISO Spray by Firestone or compatible foam adhesive by manufacturer that is suitable to achieve the required warranty. Hot or cold weather foam adhesive shall be used as required by manufacturer

L. Miro Pipe Curbs: As required for application.See drawings

M. Termination Bars: 1/8 by 1 inch minimum as supplied by roofing manufacturer and provided by contractor.

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.
   1. Notify Owner of all conditions observed that will affect the performance of the roof system; copy Architect.

C. Verify deck is clean and smooth, free of depressions, waves, or projections, properly sloped to drains. Clean deck of debris from roof tear off

D. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set and wood blocking is in place.

E. Verify that all work of subcontractors which penetrates roof deck or requires men and equipment to traverse roof deck has been completed.

F. Do not issue a proceed order to the subcontractor or proceed with work until all defects are corrected to satisfaction of and with written approval of the roofing system manufacturer.

G. Repair any minor sections of the roof deck which may have been damaged to provide smooth level surface.

H. Do not install any roof insulation until all perimeter roof edge wood blocking is installed.
   1. Plywood APA
   2. Dimension lumber shall be Douglas Fir, installed with staggered and scarfed joints, without buckles or warps and be screw fastened.

I. Verify that all roof edge perimeter conditions are constructed prior to roof system installation.

3.02 PREPARATION - CONCRETE DECK

A. Fill surface honeycomb and variations with latex filler.

B. Broom, vacuum and/or blow clean to remove all debris.

3.03 PREPARATION - METAL DECK

A. Clean and prime new and/or existing metal to to recieve self-adhered vapor barrier per manufacturers recommendations remove all debris from flute of metal deck from roof tear off

B. Install 1/2" Dens Deck Prime gypsum sheathing on metal deck with FM approved screw fasteners and stress plates at one per every two square feet, into top flute of metal roof deck only.

C. Lay sheathing with long side at right angle to flutes; stagger end joints; provide support at ends.

D. Cut sheathing cleanly and accurately at roof breaks and protrusions to provide smooth surface. Tape joints.

3.04 ROOF SYSTEM INSTALLATION

A. Install roofing with flashing systems and accessory items in strict accordance with system manufacturer's printed instructions current at the date of bidding documents. When items of conflict arise between the manufacturer's recommendations and the contract documents, the more stringent will govern unless it violates manufacturer's warranty requirements.

B. Apply roof systems as follows: Reference the drawing sheets where the description of the roof systems are or list roof areas and roof systems construction for each.

3.05 VAPOR RETARDER APPLICATION

A. Vapor Retarder: Self-Adhered Over substrate board or existing concrete deck
   1. materials shall not be applied when moisture, in any form, such as dew, can be seen or felt on the surface to which the materials are to be applied. Prime all surfaces
   2. Install per manufacturer's printed instructions.

3. Wrap vapor retarder up sides of walls and curbs to 2" above the cover board to provide continuity of vapor and air barrier seal.

B. Vapor Retarder: Bituminous Two Ply
   1. New precast roof deck:
      a. Starting at the low point, lay one layer of the base sheet by heat welding over the entire area lapping each sheet 2" over the underlaying sheet. Lap ends 6".
      b. Starting at the low point, install cap sheet over the base sheet by heat welding. Lap sides a minimum of 4" and lap the ends of the roll a minimum of 6". Offset base sheet 18". Heat weld the cap sheet seams.
      c. Vapor retarder shall be installed free of wrinkles, creases, or fishmouths. Apply sufficient pressure on rolls during application to ensure the prevention of air pockets and attain a continuous positive bond.
      d. Extend vapor retarder up walls to 2" above coverboad and seal with mastic.

3.06 INSULATION APPLICATION ADHESIVE APPLICATION: SPRAY FOAM

A. Ensure vapor retarder is clean and dry.

B. Apply adhesive to deck in accordance with adhesive and insulation manufacturer's instructions. Embed insulation into adhesive with full contact. Step into place and position so that no cupping occurs.

C. For successive layer of insulation apply adhesive to the top surface of insulation. Embed the second layer of insulation into adhesive, with joints staggered minimum 12 inches from joints of first layer.

D. Place the constant thickness first layer and the tapered thickness insulation second layer to the required slope pattern in accordance with manufacturer's instructions.

E. Place each constant layer with staggered joints of 1/2 the board width. Similar to running bond. No checker board pattern of four corners touching.

F. Place Boards perpendicular to deck flutes with edges over top flute surface for bearing support.

G. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

H. Lay tapered boards in full compliance with approved tapered insulation shop drawings layout.

I. Apply no more insulation than can be covered with cover board and membrane in same day.

J. Leading edge of tapered insulation shall be 1/2" with 0" to 1/2" tapered edge strips provided for a flush transition. Fully adhere.

K. Install two-way tapered saddles and edge strips in adhesive, as indicated on the drawings. Step into place and position so that no cupping occurs.

L. Joints between Insulation shall have surface joints 1/4" or less in width.

M. Repair all joints or holes greater than 1/4" in diameter with same material.

N. Field cut tapered and base insulation to fit around the differing deck elevations and roof curbs.

O. Install spray foam into voids between roof curb and penetrations and insulation. Fill to top of insulation and cut flush.

P. Tapered insulation shall originate at center of the roof drain and be cut perpendicular to the drain flange at the clamping ring.

3.07 COVER BOARD INSTALLTION ADHESIVE APPLICATION: SPRAY FOAM

A. Install in full accordance with roof system manufacturer's recommendations.

B. Stagger joints a minimum of 12 inches.

C. Place cover board layer with staggered joints of 1/2 the board width. Similar to running bond. No checker board pattern of four corners touching. .

D. Joints between boards to be 1/4 inch or less in width. Fill joints greater than 1/4 inch with same material per manufacturer's instructions.

E. Embed with full contact and step into place. Position so that no creeping occurs. Provide weights at corners of cover board to prevent board raising from foam

F. Lay no more cover board than can be covered by EPDM roof membrane in the same day.

3.08 MEMBRANE

A. Install non-reinforced 60 mil EPDM securement strip at the perimeter conditions.

B. Broom substrate clean prior to rolling out EPDM to remove all contaminants, including foam insulation bleed out.

C. Position membrane without stretching over the substrate.
   1. Inspect EPDM for punctures, deformation and/or manufacturer's imperfections. If observed, the EPDM sheet should be rejected. The patching of a new EPDM membrane is UNACCEPTABLE.

D. Allow the membrane to relax for approximately 1/2 hour before adhering.

E. Fold sheet in half longitudinally.

F. Apply bonding adhesive to insulation and SPM after adhesive has dried to where it does not string or stick when pushed into with finger.
   1. Roll EPDM into bonding adhesive.
   2. Broom EPDM flush to insulation to achieve positive bonding.

G. Repeat steps B through E for remaining portion of the roof.

H. Membrane should be fully adhered to insulation cover board, perimeter wood blocking and roof curbs with bond adhesive and to securement strip with splice adhesive. Membrane should extend up and over perimeter wood blocking and down 1-1/2" minimum onto the masonry, fully adhere and nail 6" on center with cap nails on the same day installed.

I. Exposed corners of the perimeter wood blocking are to be flashed with uncured EPDM extending 1" down onto masonry and nailed at 6" on center with cap nails.

J. Install water cut-offs at end of the day's work using water cut-off mastic. Remove water cut-off mastic prior to beginning the next day's work.

K. Where applicable, fold the EPDM field sheet into corners and create a "pig's ear" to eliminate excess material. Do not cut membrane. Adhere the pig's ear to the EPDM with splice adhesive.

L. Lap joints shall be a minimum of 5"-0" from roof drains.
   1. Seams shall be water lapped.

3.09 LAP SEAM TAPE SPLICES

A. Use manufacturer's weathered membrane cleaner to prepare all EPDM left open for 24 hours or more.

B. All field lap seams to be fabricated using 3" tape adhesive

C. Shingle lay membrane 5" towards the roof drain.

D. Mark 1" to the low side of the overlapping sheet with a crayon.

E. Tack back the overlaying sheet with primer at 4"-0" on center.

F. Thoroughly clean and prime membrane, both on the overlap and the under lap conditions. Allow to dry.

G. When washing and priming seam, be sure to wash lengthwise across the sheet, except at factory seams where you should wash in direction of factory seam to remove talc.

H. Install tape in proper alignment so it will protrude out 1/4" to 1/2" beyond the overlaying sheet.

I. Roll seam tape with 4" hand roller. Using hand pressure only is not acceptable.

J. Bring overlapping membrane over the top of the seam tape and release the paper.

K. Remove release paper by pulling at a 45 degree angle.

L. At seam tape laps, lap seam tape 1".

M. Untack the EPDM sheet and allow it to fall into place.

N. Following removal of the release paper, broom membrane into sealant tape.

O. Roll seam with 1-1/2" silicone roller at 45 degree angle to the seam.

P. Extreme care should be used in mating the EPDM lap seams at vertical transitions so there is a fully bonded 90 degree transition. FISH MOUTHS AT THE LAP SEAM ANGLE CHANGES ARE UNACCEPTABLE.

Q. All products used in seam must be supplied by membrane manufacturer.

R. After inspection by the Architect and acceptance of the lap seam, cover EPDM field lap seams to be covered with 6" uncured EPDM, self-adhering EPDM cover strips.

3.10 LAP SEAM COVER STRIPS

A. Following Architect's inspection of lap seam and the Architect's approval of same, wash the lap seam and EPDM membrane 6" to each side of the lap seam edge to remove any accumulated debris with clean water.

B. Scrub the power washed lap seam and EPDM membrane with water and soap, using a scrub brush. Rinse thoroughly.

C. Splice wash cleaned area. Prime 6" to each side of lap splice edge.

D. Install splice adhesive across the primed membrane with either a roller or a paint brush.

E. When the splice adhesive has been flashed off and is tacky to a finger-push test, install a 5" min piece of self-adhering cured EPDM; center down lap splice edge.

F. Thoroughly roll the self-adhering cured white EPDM cover strip into place with a rubber roller
   1. The salvaged adhesive edge of cover strip shall be thoroughly rolled into place.
   2. At cover strip laps and laps with other membranes, carefully roll along the covered edge.

G. At the cover strip laps, tee joints and other membrane location laps, an uncured EPDM patch, large enough to extend a minimum of 3" beyond the lap in all directions is to be installed. All patch corners are to be ROUNDED.

H. Splice wash all edges of the cured EPDM cover strip and the uncured EPDM patches.

I. All lap seam cover strip application to be reviewed and approved by the Architect, prior to the installation of the rubber walkway pads.

3.11 ROOF CURB AND BASE FLASHING

A. Prepare existing wall, curb etc for new membrane per manufacturers requirements

B. Verify void between roof curb and insulation has been sealed with spray foam.

C. Use manufacturer's weathered membrane cleaner to prepare EPDM left open for 24 hours or more.

D. Install manufacturers reinforced 60 mil EPDM securement strip fastened @ 12" o.c. If not possible, secure field membrane by screwing through metal anchor bar at 6" o.c. with approved screw fasteners.

E. Extend roofing membrane up wall or vertical surface or over wood blocking nailer, as indicated and fully adhere to reinforcement strip vertical surface.

F. Nail top of base flashing to wood nailer strip at 6" on center with 1" hard roofing nails with cap nails.

G. All flashings and termination shall be done in accord with the manufacturer's standard details or as detailed, whichever is more stringent.

H. Use prefabricated, self adhering corners where possible.

I. Cover anchor bar strips with SPM flashing, extending above anchor bar and 6" out on horizontal roof surface.

J. Apply appropriate adhesive to both the SPM flashing, the roofing membrane, and the curb wall.

K. After the lap cement dries to a point where it does not string or stick to the dry finger touch, roll the base flashing into the adhesive and roll with steel roller to achieve positive bonding.

L. Clean the edges of completed SPM flashing laps with an approved splice wash. Then apply the lap sealant along both edges of the SPM flashing. Feather.

M. All vertical splice laps shall be covered with a 5" minimum cover strip of uncured EPDM extend 3" beyond horizontally on the flat.

N. Fold EPDM flashing into corners to create a "pig's ear" and eliminate excess material. Do not cut off membrane. Adhere "pig's ear" to SPM.

O. Cover the vertical surfaces of end wall flashing with the uncured neoprene flashing. Apply SPM lap sealant to exposed edges of uncured neoprene flashing.

P. Terminate top of flashing on masonry with 1/8 x 1 inch aluminum termination bar with manufacturer-approved expansion anchors at 6" on center.
   1. Install water cut-off mastic between masonry and SPM, prior to installation of termination bar.
   2. Cut EPDM flush to top of termination bar.
   3. Install Polyurethane lap sealant to top of termination bar.

Q. Terminate vertical flashing ends on masonry with 1/8" aluminum termination bar with manufacturer-approved expansion anchors at 4 inches on center.
   1. Install the water-cut off mastic between masonry and SPM prior to installation of the termination bar.
   2. Cut EPDM flush to top of termination bar.
   3. Install Polyurethane lap sealant to top of termination bar.

R. Cover termination bar with metal counterflashing.

S. Remove all adhesive, lap sealant and/or seam tape stains from HVAC equipment and/or building components.

T. Secure top of flashing on plywood and wood blocking with aluminum nails @ 4" o.c. Seal top of flashing with SPM Lap Sealant installed same day as flashing.

U. The 1/8" thick aluminum termination bar must be installed atop base flashing on day base flashing in installed.

3.12 PIPE PENETRATIONS

A. Verify void between roof curb and insulation has been sealed with spray foam.

B. Use manufacturer's weathered membrane cleaner to prepare EPDM left open for 24 hours or more.

C. Flash pipe with premolded pipe flashings with self adhering flange where installation is possible

D. Where the molded pipe flashings cannot be installed, use field fabricated flashing techniques using uncured white EPDM.

E. Raise the pipe penetrations and roof vents to maintain a minimum of 8" projection above surface of new roof surface. Verify that all pipe penetrations extend to a minimum of 8 inches above the finished roof surface.

F. Apply lap sealant at all flashing edges.

G. Provide water cut-off mastic between the pipe and molded pipe flashing.

H. Install stainless steel clamping ring around pipe at top of premolded pipe flashing.

I. Install EPDM lap sealant at top pipe boot/field flashing.

J. Premolded pipe boot:
    1. When flashing must be cut to fit pipe penetration and top of premolded boot is below 8" above EPDM, pipe penetration is to be wrapped in uncured EPDM.
    2. Top edge is to be a minimum of 8" above the SPM. Premolded pipe boot is then to be installed.
    3. Wrap all gas vent pipe penetration with cured black EPDM membrane following completion of field flashing.
        a. Field Flashings
            1) Install stainless steel rain cap around pipe and over tip of field flashing.

3.13 ROOF DRAINS

A. Install new roof drains per drawings

B. Originate and set tapered insulation at center of the drain as indicated in the drawings. Cut vertically in line with insulation below.

C. Cut out insulation at roof drain, vertically at vertical interior face of drain. Insulation shall be a min of 4" at drain

D. Set cover board over roof drain and extension ring. Cut cover board insulation perpendicular to drain flange at the clamping ring.

E. Extend EPDM over roof drain with lap seam greater than 5'-0" away. Cut a circular hole in the EPDM without end cuts or burrs on the EPDM, 1/2" maximum inside vertical wall of extension ring.

F. Seal between the membrane and drain flange with water cut-off mastic, as indicated in manufacturer's standard details.

G. Place a full tube of water cut-off mastic below the EPDM atop the roof drain extension flange.

H. Set clamping rings and clamping ring bolts. Set and secure drain dome.

3.14 DAILY SEAL

A. Stair step vapor barrier, insulation and cover board 12" each at end of working day. To provide the required staggering required above.

B. Temporarily seal loose edges of membrane with water cut-off mastic or adhesive at end of the working day. Loose night seals are unacceptable.
    1. Surface shall be clean and dry.
    2. Apply water cut-off mastic at a rate of 100 lineal feet per gallon, 12" back from edge of sheet onto exposed surface.
    3. If necessary, use a trowel to spread material in order to achieve complete seal.

C. After embedding the membrane in night seal, check for continuous contact. Weight edge, providing continuous pressure over length of the cut off.

D. When the work is resumed, pull sheet face free before continuing installation.

E. Cut off and remove a portion of EPDM with water cut-off mastic on it prior to commencing the next days roofing operations.

3.15 RUBBER WALKWAY PADS

A. Install in full accordance with manufacturer's printed instructions as laid out on the drawings. If no roof walkway pads are shown on the drawings, provide 50 walkway pads to be located as directed by Architect

B. Verify location with Architect and Head of Maintenance or Director of Facilities.

C. Place walkways 1" or less from the vertical face of roof hatches or roof curbs vertical surfaces.

D. Place walkway pads with 3 1/2" space between pads

E. Do not install walkway pad over field seems, even if the are covered with lap seam cover strips

F. Provide rubber walkway pads to HVAC contractor, as needed, for use as pipe supports.

3.16 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Field inspection and Testing.

B. Correct identified defects or irregularities.

3.17 CLEANING

A. Section 01 70 00 - Closeout Submittals: Cleaning installed work.

B. In areas where finished surfaces are soiled by Work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.

C. Repair or replace defaced or disfigured finishes caused by Work of this section.

D. Remove all membrane adhesive stains from building surfaces and/ or roof top equipment.

E. Remove all spray foam or asphalt adhesive from roof surfaces, building surfaces, or roof top equipment.

3.18 PROTECTION OF FINISHED WORK OR EXISTING ROOFING

A. Section 01 70 00 - Closeout Submittals: Protecting installed work.

B. Protect building surfaces against damage from roofing work.

C. Where traffic must continue over finished roof membrane or path of travel is required over existing roofing protect surfaces with 1/2" plywood minimum over 1" rigid insulation.

END OF SECTION 07 53 10

SECTION 07 62 00
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Copings, fascias, counterflashings, and fabricated sheet metal items and miscellaneous flashing.

B. Manufactured sheet metal items, including copings and gravel stops.

C. Fabricated sheet metal items, including flashings, counterflashings, expansion joint covers, scuppers and trim.

D. Reglets and accessories.

1.02 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

B. ASTM B32 - Standard Specification for Solder Metal; 2020.

1.03 RELATED SECTIONS

A. Section 06 10 00 - Wood Blocking and Curbing.

B. Section 07 53 10 - Single Ply Roofing - Fully Adhered EPDM.

1.04 REFERENCES

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.

B. ASTM B32 - Standard Specification for Solder Metal.

C. ASTM D2178 - Standard Specification for Asphalt - Saturated Glass Felt Used in Roofing and Waterproofing.

D. FS TT-C-494 - Coating Compound, Bituminous, Solvent Type, Acid Resistant.

E. CDA (Copper Development Association) - Copper in Architecture - Handbook.

F. SMACNA (Sheet Metal and Air Conditioning Contractors National Association) - Architectural Sheet Metal Manual, Fifth Edition, 1993.

1.05 DESIGN REQUIREMENTS

A. Sheet Metal Flashings: Comply with the criteria of SMACNA "Architectural Sheet Metal Manual."

1.06 SUBMITTALS FOR REVIEW

A. Section 01 30 00 - Administrative Requirements: Procedures for submittals.

B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

C. Product Data: Provide data on sheet metal material and prefabricated components.

D. Samples: Submit two full size samples, 12" inches long illustrating typical coping material and finish. Include continuous cleats, backer plates, cover plates and/or drive cleats.

E. Submit two manufacturer's color charts, illustrating metal finish colors.

1.07 SUBMITTALS AT PROJECT CLOSEOUT

A. Section 01 78 00 - Closeout Submittals

B. Warranty: Submit manufacturer's 20 year material warranty. Ensure forms have been completed in Owner's name and registered with manufacturer.

C. Warranty: Submit contractor's two year workmanship warranty.

1.08 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual requirements and standard details, except as otherwise noted.

B. Fabricator and Installer Qualifications: Company specializing in architectural sheet metal work with five years documented experience.

1.09 PRE-INSTALLATION MEETING

A. Section 01 70 00 - Execution Requirements: Pre-installation meeting.

B. Convene One week before starting work of this section.

1.10 DELIVERY, STORAGE, AND PROTECTION

A. Section 01 60 00 - Product Requirements: Transport, handle, store, and protect.

B. Stock material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
   1. When material is stored on the roof it must be placed on ½" minimum plywood on 1" rigid insulation. Ends of plywood shall exceed end of sheet metal goods by 2'-0".

C. Prevent contact with materials which may cause discoloration or staining.

D. All field cutting of sheet metal performed over new roofing shall be permitted only where the new roof is protected by ½" minimum plywood on 1" rigid insulation.

1.11 PROJECT CONDITIONS

A. Project Coordination: Section 01 30 00 - Administrative Requirements.

1.12 WARRANTY

A. Section 01 78 00 - Closeout Submittals

B. Sheet Metal Contractor to issue workmanship warranty to correct defective work within a two year period after Date of Substantial Completion. Defective work includes failure of watertightness or seals and oil canning due to rupture restricted expansion/contractors or faulty workmanship.

C. Material warranty from the sheet metal manufacturer for a period of 20 years against deterioration of color, chalking and film integrity.

PART 2 PRODUCTS

2.01 PROVIDE EITHER OF THE TWO SYSTEMS AT CONTRACTOR'S OPTION.

A. SHEET MATERIALS
   1. Pre-Finished Galvanized Steel Sheet: ASTM A653/A653M,G90 zinc coating; 0.02 inch, 24 gauge core steel, shop pre- coated with PVDF (polyvinylidene fluoride) coating; color as selected from manufactuer's full color line.

B. METAL ROOF EDGE SYSTEM
   1. Metal Roof Edge System: Prefinished, galvanized steel conforming to requirements of Sheet Materials, above, and tested in accordance with the requirements of ANSI/SPRI ES-1.
   2. Acceptable Products:
      a. Carlisle-SynTec System; SecurEdge. SecurEdge 2000 Fascia. SecurEdge 200 Gold Coping
      b. Holcim Elevate; AnchorGard Platinum Fascia, Elevate Gold Coping
      c. Johns Manville Corp.;

2.02 ACCESSORIES

A. Fasteners: Stainless steel with neopene washers.

B. Primer: Zinc molybdate type.

C. Protective Backing Paint: Zinc molybdate alkyd.

D. Silicone Sealants:
   1. Bondaflex Sil290
   2. Dow Corning Corp; Product 790.
   3. GE Silicones; Product Silpruf LM CS 2700/ SilPruf SCS 2000.
   4. Pecora Corporation; Product 890: www.pecora.com.
   5. BASF Construction Chemicals-Building Systems: www.chemrex.com.
   6. Tremco, Inc; Product Spectrum 1.
   7. Substitutions: See Section 01 60 00 - Product Requirements.

E. Solder: ASTM B32; 50/50 type.

F. Reglets: Recessed type, galvanized steel; face and ends covered with plastic tape;

2.03 FABRICATION - GENERAL

A. Fabricate continuous cleats of same materials as coping minimum 3 inches wide, interlocking with sheet a min. of ½".
   1. Drill pilot holes at 4" o.c. for attachment to wood.
   2. Drill pilot holes at 6" o.c. for attachment to masonry or concrete.

B. All fastener locations will have predrilled pilot holes:
   1. Nails - 1/4" diameter @ 4" o.c.
   2. Screw Fasteners - 5/16" diameter @ 1'-0" o.c.

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. Tin edges of copper sheet to be soldered. Solder shop formed metal joints. After soldering, remove flux. Wipe and wash solder joints clean. Weather seal joints.

G. Fabricate corners from one piece with minimum 24-inch long legs; drive cleat for rigidity, seal with sealant and post finished to match adjacent finish..

H. Fabricate vertical faces with bottom edge formed outward 1/2 inch and hemmed to form drip.

I. Fabricate flashings to allow toe to extend 2 inches over roofing . Return and brake edges.

J. Fabricate accessories in profile and size to suit gutters and downspouts.

K. Anchorage Devices: in accordance with SMACNA requirements.

L. Seal metal joints.

2.04 FABRICATION - MINIMUM SIZES

A. General: Fabricate sheet metal items in thickness or weight needed to comply with gauges indicated on the Drawings, but not less than that listed below for each application and metal.

B. Splash Pans: Fabricate from the following material:
   1. Copper: 16 oz./sq. ft.
   2. Lead-Coated Copper: 16 oz./sq. ft.
   3. Aluminum: 0.040 inch thick.
   4. Stainless Steel: 0.0187 inch thick.
   5. Terne-Coated Stainless Steel: 0.018 inch thick.

C. Roof-Drain Flashing: Fabricate from the following material:
   1. Lead: 4.0 lb/sq. ft., hard tempered.
   2. Copper: 12 oz./sq. ft.
   3. Lead-Coated Copper: 12 oz./sq. ft.
   4. Stainless Steel: 0.0156 inch thick.
   5. Terne-Coated Stainless Steel: 0.015 inch thick.

D. Scuppers: Fabricate from the following material:

1. Copper: 16 oz./sq. ft.
2. Lead-Coated Copper: 16 oz./sq. ft.
3. Aluminum: 0.0320 inch thick.
4. Stainless Steel: 0.0187 inch thick.
5. Terne-Coated Stainless Steel: 0.018 inch thick.
6. Galvanized Steel: 0.0276 inch thick.
7. Aluminum-Zinc Alloy-Coated Steel: 0.0276 inch thick.
8. Coil-Coated Galvanized Steel: 0.0276 inch thick.

E. Exposed Trim, Gravel Stops, and Fasciae: Fabricate from the following material:
1. Copper: 20 oz./sq. ft.
2. Lead-Coated Copper: 20 oz./sq. ft.
3. Aluminum: 0.050 inch thick.
4. Stainless Steel: 0.0187 inch thick.
5. Terne-Coated Stainless Steel: 0.018 inch thick.
6. Galvanized Steel: 0.0276 inch thick.
7. Aluminum-Zinc Alloy-Coated Steel: 0.0276 inch thick.
8. Coil-Coated Galvanized Steel: 0.0276 inch thick.

F. Copings: Fabricate from the following material:
1. Copper: 24 oz./sq. ft.
2. Lead-Coated Copper: 24 oz./sq. ft.
3. Aluminum: 0.050 inch thick.
4. Stainless Steel: 0.0250 inch thick.
5. Terne-Coated Stainless Steel: 0.0250 inch thick.
6. Galvanized Steel: 0.0396 inch thick.
7. Aluminum-Zinc Alloy-Coated Steel: 0.0396 inch thick.
8. Coil-Coated Galvanized Steel: 0.0396 inch thick.

G. Base Flashing: Fabricate from the following material:
1. Copper: 20 oz./sq. ft.
2. Lead-Coated Copper: 20 oz./sq. ft.
3. Aluminum: 0.040 inch thick.
4. Stainless Steel: 0.0187 inch thick.
5. Terne-Coated Stainless Steel: 0.018 inch thick.
6. Galvanized Steel: 0.0276 inch thick.
7. Aluminum-Zinc Alloy-Coated Steel: 0.0276 inch thick.
8. Coil-Coated Galvanized Steel: 0.0276 inch thick.

H. Counterflashing: Fabricate from the following material:
1. Copper: 16 oz./sq. ft.
2. Lead-Coated Copper: 16 oz./sq. ft.
3. Aluminum: 0.0320 inch thick.
4. Stainless Steel: 0.0187 inch thick.
5. Terne-Coated Stainless Steel: 0.018 inch thick.
6. Galvanized Steel: 0.0217 inch thick.
7. Aluminum-Zinc Alloy-Coated Steel: 0.0217 inch thick.
8. Coil-Coated Galvanized Steel: 0.0217 inch thick.

I. Flashing Receivers: Fabricate from the following material:
1. Copper: 16 oz./sq. ft.
2. Lead-Coated Copper: 16 oz./sq. ft.
3. Aluminum: 0.0320 inch thick.
4. Stainless Steel: 0.0156 inch thick.
5. Terne-Coated Stainless Steel: 0.015 inch thick.
6. galvanized Steel: 0.0217 inch thick.

7. Aluminum-Zinc Alloy-Coated Steel: 0.0217 inch thick.
8. Coil-Coated Galvanized Steel: 0.0217 inch thick.

J. Valley Flashing: Fabricate from the following material:
1. Copper: 16 oz./sq. ft.
2. Lead-Coated Copper: 16 oz./sq. ft.
3. Stainless Steel: 0.0187 inch thick.
4. Terne-Coated Stainless Steel: 0.018 inch thick.
5. Coil-Coated Galvanized Steel: 0.0276 inch thick.

K. Drip Edges: Fabricate from the following material:
1. Copper: 16 oz./sq. ft.
2. Lead-Coated Copper: 16 oz./sq. ft.
3. Aluminum: 0.0320 inch
4. Stainless Steel: 0.0156 inch thick.
5. Terne-Coated Stainless Steel: 0.015 inch thick.
6. Galvanized Steel: 0.0217 inch thick.
7. Aluminum-Zinc Alloy-Coated Steel: 0.0217 inch thick.
8. Coil-Coated Galvanized Steel: 0.0217 inch thick.

L. Eave Flashing: Fabricate from the following material:
1. Copper: 16 oz./sq. ft.
2. Lead-Coated Copper: 16 oz./sq. ft.
3. Aluminum: 0.0320 inch thick.
4. Stainless Steel: 0.0156 inch thick.
5. Terne-Coated Stainless Steel: 0.015 inch thick.
6. Galvanized Steel: 0.0217 inch thick.
7. Aluminum-Zinc Alloy-Coated Steel: 0.0217 inch thick.
8. Coil-Coated Galvanized Steel: 0.0217 inch thick.

M. Equipment Support Flashing: Fabricate from the following material:
1. Copper: 16 oz./sq. ft..
2. Lead-Coated Copper: 16 oz./sq. ft.
3. Stainless Steel: 0.0187 inch thick.
4. Terne-Coated Stainless Steel: 0.018 inch thick.
5. Galvanized Steel: 0.0276 inch thick.
6. Aluminum-Zinc Alloy-Coated Steel: 0.0276 inch thick.
7. Coil-Coated Galvanized Steel: 0.0276 inch thick.

N. Roof-Penetration Flashing: Fabricate from the following material:
1. Lead: 4.0 lb/sq. ft., hard tempered.
2. Copper: 16 oz./sq. ft.
3. Lead-Coated Copper: 16 oz./sq. ft.
4. Stainless Steel: 0.0187 inch thick.
5. Terne-Coated Stainless Steel: 0.018 inch thick.
6. Galvanized Steel: 0.0276 inch thick.
7. Aluminum-Zinc Alloy-Coated Steel: 0.0276 inch thick.

O. Shower Pans: Fabricate from the following material:
1. Lead: 4.0 lb/sq. ft., hard tempered.
2. Copper: 12 oz./sq. ft.
3. Lead-Coated Copper: 12 oz./sq. ft.
4. Stainless Steel: 0.0156 inch thick.
5. Terne-Coated Stainless Steel: 0.015 inch thick.

P. Overhead-Piping Safety Pans: Fabricate from the following material:
1. Copper: 24 oz./sq. ft.

2. Lead-Coated Copper: 24 oz./sq. ft.
3. Stainless Steel: 0.0250 inch thick.
4. Terne-Coated Stainless Steel: 0.0250 inch thick.
5. Galvanized Steel: 0.0396 inch thick.

Q. Roof Expansion-Joint Cover: Fabricate from the following material:
1. Copper: 16 oz./sq. ft.
2. Lead-Coated Copper: 16 oz./sq. ft.
3. Aluminum: 0.040 inch thick.
4. Stainless Steel: 0.0187 inch thick.
5. Terne-Coated Stainless Steel: 0.018 inch thick.
6. Galvanized Steel: 0.0276 inch thick.
7. Aluminum-Zinc Alloy-Coated Steel: 0.0276 inch thick.
8. Coil-Coated Galvanized Steel: 0.0276 inch thick.

R. Roof-to-Wall Expansion-Joint Cover: Fabricate from the following material:
1. Copper: 16 oz./sq. ft.
2. Aluminum: 0.050 inch thick.
3. Stainless Steel: 0.0250 inch thick.
4. Terne-Coated Stainless Steel: 0.0250 inch thick.
5. Galvanized Steel: 0.0336 inch thick.
6. Aluminum-Zinc Alloy-Coated Steel: 0.0336 inch thick.
7. Coil-Coated Galvanized Steel: 0.0336 inch thick.

S. Form sections true to shape, accurate in size, square, and free from distortion or defects.

2.05 FACTORY FINISHING

A. PVDF coating: Multiple coat, thermally cured, fluoropolymer system conforming to AAMA 605.2.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

C. Verify roofing termination and base flashings are in place, sealed, and secure.
1. Verify that surfaces to receive sheet metal are smooth and clean will not impinge upon the integrity of the sheet metal.

D. Verify that all wood blocking to receive sheet metal is properly installed, anchored without warps and covered with EPDM.

E. Do not start sheet metal work until conditions relevant to sheet metal work are acceptable. Commencing of work will indicate acceptance of condition.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Lay out joints to be symmetrical about the building corners. May require more than one run be cut down to attain symmetry.

C. Paint dissimilar metals with bituminous paint to form a complete barrier.

3.03 INSTALLATION

A. Insert flashings into reglets to form tight fit. Secure in place with lead wedges. Pack remaining spaces with foam rod. Prime surfaces to receive sealant and seal flashings into reglets with sealant.

B. Secure flashings in place using concealed fasteners as indicated in the drawings.

1. Apply plastic cement compound between metal flashings and felt flashings.
    a. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles. Install work watertight, without buckles, warps, fastening stresses or distortion. Allow for expansion and contraction.

C. Extreme care should be taken by Sheet Metal Contractor not to puncture the roofing membrane with metal. All metal trimmings shall be placed in an on-roof-top container.

D. Verify height of aluminum roof base flashing termination bar allows for installation of counterflashing and sealant below weep holes and throughwall flashing.

E. Continuous Cleats: Set in water cut-off mastic supplied by the Roofing Contractor or sealant, as indicated in the drawings. Secure to the surface with nail fasteners through 1/4-inch predrilled pilot holes at 4-inch on center.

F. Copings: Set continuous cleat in a full bed of water cut-off mastic supplied by the roofing contractor. Set the outside and inside corners. Secure with ¾" x ¼" Atlas HHA stainless steel Type A point screw fasteners with neoprene washers that are covered with sealant, following Architect's approval.
    1. Lay out coping joints symmetrical about the building corners. May require multiple cutting at 10'-0" lengths to achieve same. Install backer plates at joint locations. Nail through predrilled 1/4-inch pilot holes. Apply continuous sealant to backer plate vertical and horizontal surfaces as indicated in drawings.
    2. Run joints at +10'-0", except where the cut pieces are required for symmetry between existing corners.
    3. Secure coping to continuous cleat and pull coping over roof edge wood block. Cut 10'- 0" lengths to size to provide symmetrical placement between existing building corners.
    4. Verify coping is tight to wood blocking. Anchor with 1-¼" x ¼" Atlas HHA stainless steel screw fasteners, Type A points with neoprene washers. Cover with sealant, following Architect's approval.
    5. Install sealant to each side of joints.
    6. Install drive cleat.

G. Fascias:
    1. Set continuous cleat in full bed of sealant or water cut-off mastic supplied by Roofing Contractor, as indicated in the drawings. Secure with nails at 4" on center through ¼" pre-drilled pilot holes.
    2. Set the outside and inside corners. Secure with nails at 4" o.c. through ¼" pre-drilled pilot holes.
    3. Lay out fascia joints symmetrical about corners. May require multiple cutting to achieve lengths of 10'-0".
    4. Apply continuous sealant to backer plate vertical and horizontal surfaces as indicated in drawings.
    5. Secure fascia to continuous cleat and nail at 4" o.c. through 1/4-inch pre-drilled pilot holes.

H. Counterflashing:
    1. Overlap the base flashing a minimum of 3".
    2. Install continuous butyl caulk tape to vertical portion of the counterflashing.
    3. Secure to the masonry with 1-¼" x 3/16" tapcons with climaseal corrosion resistive coating and neoprene washers at 1'-0" on center through 5/16" pre-drilled pilot holes. Cover with sealant following the Architect's approval.
    4. Lap counterflashing pieces 3" with bead of sealant and between pieces.
    5. Cover fastener heads with sealant after the Architect's approval.
    6. Fill sealant reservoir with sealant to shed water.
    7. Counterflashing Corner Pieces: Install pieces per Steps 1 through 6 inch 3.3.I. above.

I. Expansion Joint Covers:
    1. Lay out joint locations to be symmetrical about ends.
    2. Set backer plates in full bed of water cut-off mastic.

3. Install sealant to both sides of top and vertical joint location on backer plate.
4. Set cover pieces, centering joint on backer plates.
    a. Install cleats at sloped horizontal joint locations. Lock into hems. Nail in place. Cover nail head with sealant.
    b. Install 1-¼" x ¼" tapcon screw fasteners with climaseal corrosion coating and neoprene washers or 1-¼" x ¼" Atlas HHA Type "A" point stainless steel screw fasteners with neoprene washers, where indicated, at 1'-0" o.c. through 3/16" pre-drilled pilot holes.
5. Install sealant to expansion joint cover drive cleat hems.
6. Install drive cleat at cover joints, center on hems and close end.
7. Install expansion joint cover as shown in detail. Hand crimp lock seam at short leg.
8. Install sealant into expansion joint cover drive cleat hems.
9. Install drive cleat close ends.
10. Close end of expansion joint as indicated on drawings.

J. End Wall Flashings:
1. Set in full bed of water cut-off mastic.
2. Secure with screw fasteners through ¼" pre-drilled pilot holes as indicated on drawings.
3. Coordinate installation with roofing contractor.
4. Have the roofing contractor flash in vertical flange of end wall flashing.
5. Install coping, or standing seam siding, over the end wall flashing by:
6. Secure to end wall flashing vertical flange and pulling coping over the roof edge wood blocking, or, securing to the continuous clip and laying against mansard

K. Thru Wall Flashing: Coordinate with masonry contractor.

L. Miscellaneous Flashings: Install as indicated on drawings.
1. Coordinate with interfacing contractors.

M. Gravel Stops:
1. Set continuous cleat in a full bed of sealant or water cut-off mastic as indicated on the Drawings.
2. Set the outside and inside corners.
    a. Lay out gravel stop joints symmetrical about the building corners. May require multiple cutting at 10'-0" lengths to achieve same.
3. Install backer plates at joint locations. Nail through predrilled ¼" pilot holes.
    a. Apply continuous sealant to backer plate vertical and horizontal surfaces as indicated in drawings.
4. Run joints at +10'-0", except where the cut pieces are required for symmetry between existing corners.
    a. Secure gravel stop to continuous cleat and pull coping over roof edge wood block. Cut 10'- 0" lengths to size to provide symmetrical placement between existing building corners.
    b. Verify gravel stop is tight to wood blocking. Secure with stainless screw fasteners with neoprene washers at 1'-0" o.c.
5. Install sealant to each side of joints.
6. Install cover plates as detailed.

3.04 CLEANING

A. Leave material clean and free of stains.

B. Remove all sheet metal debris from roof top daily.

C. Remove all sheet metal debris from site daily.

3.05 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Field inspection.

B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

3.06 SCHEDULE

A. Copings

B. Fascias

C. Endwall Flashings

D. Flashings Associated with Shingle Roofing, including Valley, Hip, Ridge, Eave, Gutter Edge, Gable Edge, Chimney:

E. Sheet Metal Roof Expansion Joint Covers, and Roof-to-Wall Joint Covers:

F. Counterflashings at Roofing Terminations over roofing base flashings:

G. Counterflashings at Curb-Mounted Roof Items, including roof hatches:

H. Roofing Penetration Flashings, for Pipes, Structural Steel, and Equipment Supports:

END OF SECTION 07 62 00

SECTION 07 72 00
ROOF ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Roof curbs.

B. Equipment rails.

C. Roof penetrations mounting curbs.

D. Non-penetrating pedestals.

1.02 REFERENCE STANDARDS

A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

C. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2018, with Amendment (2019).

1.03 SUBMITTALS

A. See Section 01 30 00 - 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.

C. Shop Drawings: Submit detailed layout developed for this project and provide dimensioned location and number for each type of roof accessory.

D. Warranty Documentation:
   1. Submit manufacturer warranty.
   2. Ensure that forms have been completed in Owner's name and registered with manufacturer.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store products under cover and elevated above grade.

1.05 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 ROOF CURBS

A. Roof Curbs Manufacturers:

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 flat roof deck sheathing with insulation.
   2. Sheet Metal Material:
      a. Aluminum: 0.080 inch minimum thickness, with 3003 alloy, and H14 temper.
   3. Roofing Cants: Provide integral sheet metal roofing cants dimensioned to begin slope at top of roofing system at 1:1 slope; minimum cant height 4 inches.

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: 14 inches, minimum.

D. Equipment Rail Curbs: Straight curbs on each side of equipment, with top of curbs horizontal and level with each other for equipment mounting.

E. Pipe, Duct, or Conduit Mounting Curbs: Vertical posts, minimum 8 inches square unless otherwise indicated.

2.02 NON-PENETRATING ROOFTOP SUPPORTS/ASSEMBLIES

A. Non-Penetrating Rooftop Support/Assemblies: Manufacturer-engineered and factory-fabricated, with pedestal bases that rest on top of roofing membrane, and not requiring any attachment to roof structure and not penetrating roofing assembly.
   1. Design Loadings and Configurations: As required by applicable codes.
   2. Height: Provide minimum clearance of 6 inches under supported items to top of roofing.
   3. Support Spacing and Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
   4. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.
   5. Hardware, Bolts, Nuts, and Washers: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A153/A153M.

B. Pipe Supports: Provide attachment fixtures complying with MSS SP-58 and as indicated.

C. Duct Supports: Provide extruded aluminum supports and sized in accordance with diameter of supported ducts, and with base that is non-penetrating of roofing membrane.

D. Non-Penetrating Pedestals: Steel pedestals with square, round, or rectangular bases.
   1. Bases: High density polypropylene.
   2. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
   3. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.

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.

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 07 72 00

SECTION 07 72 10
ROOF LADDERS AND HATCHES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Factory Fabricated Roof Hatches.

B. Safety Rail System.

C. Aluminum Roof Ladder.

1.02 RELATED REQUIREMENTS

A. Section 07 53 10 - Single-Ply Fully Adhered EPDM Roofing

B. Section 07 62 00 - Sheet Metal Flashing and Trim: Roof accessory items fabricated from sheet metal.

1.03 REFERENCE STANDARDS

A. 29 CFR 1910.23 - Ladders; Current Edition.

B. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008 (Reaffirmed 2018).

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.

D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025.

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.

H. FM (AG) - FM Approval Guide; Current Edition.

I. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2018, with Amendment (2019).

J. UL (DIR) - Online Certifications Directory; Current Edition.

K. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition.

1.04 SUBMITTALS

A. See Section 01 30 00 - 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.

C. Shop Drawings: Submit detailed layout developed for this project and provide dimensioned location and number for each type of roof accessory.

D. Warranty Documentation:
   1. Submit manufacturer warranty.
   2. Ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store products under cover and elevated above grade.

1.06 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Extended Correction Period: Correct defective work within 5-year period commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.01 ROOF HATCHES

A. Roof Hatches, General: Factory-assembled aluminum frame.
   1. Mounting: Provide frames and curbs suitable for mounting conditions indicated on the drawings.
   2. Type NB-50T Roof Hatch - Mill finish aluminum roof hatch with full aluminum cover; fully lined and insulated.
      a. Size: 30" x 36".

B. Roof Hatch Manufacturers:
   1. Basis of Design: Bilco Company; Type TB (various types and special size): www.bilco.com/#sle.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

C. Style: Provide flat metal covers unless otherwise indicated.
   1. Mounting: Provide frames and curbs suitable for mounting conditions as indicated on drawings.
   2. Cover shall be reinforced to support a minimum live load of 40 psf with a maximum deflection of 1/150th of the span or 20 psf wind uplift.
   3. Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
   4. Operation of the cover shall not be affected by temperature.
   5. Entire hatch shall be weathertight with fully welded corner joints on cover/ curb.
   6. Hatch Cover: Shall be 11 gauge aluminum with a 3" beaded flange with formed reinforcing members. Cover shall have a heavy extruded thermoplastic rubber gasket, fitted into a retainer that is mechanically fastened to the cover interior.

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; 3 inches 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 (0 psi) live load.
   2. Material: Mill finished aluminum; outer cover 11 gauge, 0.0907 inch thick, liner 0.04 inch thick.
   3. Insulation: Manufacturer's standard 3 inch rigid glass fiber.
   4. Gasket: Neoprene, continuous around cover perimeter.

2.02 SAFETY RAIL SYSTEM

A. Safety Railing System: Roof hatch safety rail system mounted directly to curb without penetration of roofing system.
   1. Railing Size: As indicated on drawings.
   2. Railing: Comply with 29 CFR 1910.23 for ladder safety, with a safety factor of two.
   3. Posts and Rails: Galvanized steel tubing.
   4. Gate: Same material as railing; automatic closing with latch.
   5. Finish: Manufacturer's standard, factory applied finish.
   6. Gate Hinges and Post Guides: ASTM B221 (((ASTM B221M))), 6063 alloy, T5 temper aluminum.

7. Mounting Brackets: Hot dipped galvanized steel, 1/4 inch thick, minimum.
8. Fasteners: Stainless steel, Type 316.
9. Products:
    a. Basis of Design: Safety Rail Company LLC; SRC HatchGuard. www.safetyrailcompany.com.
        1) 4 sided safety rail with 2'-0" first step landing zone
    b. Substitutions: Not permitted.

2.03 ROOF LADDERS

A. Modular Aluminum Fixed Ladders
1. Basis of Design: KATTCLIMB by FIXFAST USA
2. Design Loadings and Configurations: As required by applicable codes. OSHA Standard 1910.23 and ANSI A14.3 as applicable
3. Non-Penetrating Supports : As reuired for not penetrating the roof membrane.
4. Components: Aluminum 6106-T6
5. Width - 24 inches between stiles
6. Stiles - Aluminum extruded stile
7. Rung - 12 inch spacing. 1 1/4-inch square extruded serrated rung
8. Min Clearance behind ladder - 7 inch vertical postion
9. Stile extension above landing - 42 inches
10. Landing - 24 inch landing w/ 1/2-inch mesh platform surface ribbed finish. 42 inch high handrail and midrail
11. Working Load Limit - Support 1000 lb loading without failure and individual tread shall withstand 1000 lb loading without failure
12. Fixings - 3/8-inch bolt set min
13. Warranty - 10 years
14. Finish: Manufactures standard
15. Manufacturers
    a. Fixfast USA: - KATTCLIMB RL 35; www.fixfastusa.com.
    b. O'Keeffe's Inc: 503A Access Ladder; www.okeeffes.com.
    c. Substitutions: Accepted.

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. Coordinate installation of the aluminum interior liner with the roof deck, prior to the installation of the roof hatch. FAILURE TO DO SO WILL RESULT IN REJECTION OF THE ROOF HATCH ASSEMBLY.

C. Coordinate with installation of the roofing system and related flashings for a weathertight seal.

D. Installer shall check as-built conditions and verify from the manufacturer's approved roof shop drawings that the hatch will fit the opening in the roof deck.

E. Installer shall furnish mechanical anchors consistent with the roof deck and structural system.

F. Adjust and coordinate hatch location with interior ladder.

G. Adjust hinges for a smooth operation.

H. Apply bitumastic paint on surfaces of units in contact with cementitious materials.

I. Install roof flashing to hatch curb in full compliance with the roof system manufacturer's requirements. Extend up to integral curb flashing and return down. Install 1/2" diameter foam rod up into flashing return within the integral curb flashing. Set flashing clips.

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 07 72 10

SECTION 07 76 00
ROOF PAVERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Roof pavers.

B. Pedestals.

C. Pavers and pedestals with wind uplift resistance.

1.02 RELATED REQUIREMENTS

A. Section 07 53 00 - Elastomeric Membrane Roofing: Substrate for roof paver system.

1.03 REFERENCE STANDARDS

A. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

B. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics; 2023.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.

D. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings; 2025.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week 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 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data indicating paver and pedestal materials.

C. Shop Drawings: Submit shop drawings that indicate paver and pedestal layout, including overall plan and detail drawings of system components.

D. Samples of Pavers: Submit two samples for each type, color and texture indicated.

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

F. Manufacturer's Installation Instructions: Indicate substrate precautions, special procedures, and perimeter conditions requiring special attention.

G. Manufacturer's qualification statement.

H. Installer's qualification statement.

I. Warranty Documentation:
   1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
   2. Submit documentation from installer that installation complies with warranty conditions for roof paver system.

J. Maintenance Materials: Furnish the following for Owner's use in maintenance of project:

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with at least three years of documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section with at least three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. See Section 01 74 19 - Construction Waste Management and Disposal for packaging waste requirements.

B. Deliver materials in manufacturer's original containers, dry and undamaged, with seals and labels intact.

C. Store materials at least 4 inches above ground in dry location, and covered with polyethylene sheet to protect from contact with materials that may cause staining or discoloration.

1.08 FIELD CONDITIONS

A. Do not install roof paver components during cold or wet weather conditions.

1.09 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 2-year manufacturer warranty to replace material that shows manufacturing defects. Complete forms in Owner's name and register with manufacturer.

C. Installer Warranty: Provide 2-year warranty for defects of labor and/or workmanship commencing on the Date of Substantial Completion. Complete forms in Owner's name and register with installer.

PART 2 PRODUCTS

2.01 ROOF PAVERS

A. Roofing System: See Section 07 53 10 for information on roofing system where pavers are being installed.

B. Precast Concrete Roof Pavers: Precast concrete tiles, with texture and color as indicated; supported by adjustable pedestal system.
   1. Comply with local wind load resistance requirements of ASCE 7.
   2. Texture and Color: As selected by Architect from manufacturer's standard line.
   3. Length and Width: 23-7/8 by 23-7/8 inches, nominal.
   4. Thickness: 2 inches, nominal.
   5. Products:
      a. Hanover Architectural Products, Inc; Roof Pavers: www.hanoverpavers.com/#sle.
      b. Unilock; ____: www.unilock.com/#sle.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PEDESTALS

A. Pedestals: High impact plastic; adjustable height.
   1. Comply with local wind load resistance requirements of ASCE 7.
   2. Self-Ignition Temperature: Provide plastic pedestal components with self-ignition temperature greater than 650 degrees F in accordance with ASTM D1929 test method.
   3. Base Diameter: ___ inches, minimum.
   4. Roof Slope Correction: Zero to 5 percent.
   5. Pedestal Height: Within 2-1/4 inch to 24 inches, with use of 4-3/16 inch diameter SDR-35 PVC pipe, with maximum static load of 2,000 lb per pedestal in system.
   6. Pedestal Spacing: 23-3/4 inches on center.
   7. Provide rigid insulation with at least 60 psi compressive strength when part of pedestal support structure, and ensure other components supporting pedestals are of similar or greater compressive strength.
   8. Products:
      a. Hanover Architectural Products, Inc; Elevator Pedestal System: www.hanoverpavers.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 ACCESSORIES

A. Paver Edge Restraints: Provide closure to underside of pavers along perimeter edge of pavers or areas that change elevation or step-down; provide restraint system that fully contain pavers and tie back into building wall or parapet.
   1. Metal Flashing: Two piece metal edge, at least 22 gauge, 0.03 inch prefinished galvanized metal supported from paver edge and ledger board anchored to pedestals.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive this work.

B. Verify substrate is supported and secure.

C. Verify substrate is clean and smooth, dry and free of snow or ice, flat without depressions, waves or projections, properly sloped and suitable for installation of roof paver system.

D. Verify that roof openings, curbs, and penetrations through roof are solidly set.

E. Verify system elevations, required pedestal heights, and substrate dimensions.

3.02 PREPARATION

A. Use of pedestal system is for pedestrian traffic only and each side of deck system must be restrained containing decking panels with perimeter blocking or walls; movement of decking panels laterally is not permitted.

B. Membrane waterproofing and protection board surfaces used to support pedestals to be broom clean, free of frost, dirt, oil or any rough foreign matter that may impair substrate material manufacturer's warranty requirements.

C. Provide substrate for pedestals with slope and positive drainage in accordance with applicable building codes.

D. Substrate surface that will support paver and pedestal system must be structurally capable of carrying dead and live loads anticipated.
   1. Insulation Under Roofing Membrane: Insulation installed within a roofing system below roof paver supports must meet roofing membrane manufacturer's recommended installation instructions and have compressive strength of at least 60 psi.
   2. Drainage Mat: Install drainage mat in accordance with manufacturer's recommendations to avoid crushing.

E. If preparation is responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.

F. Commencement of this work implies acceptance of surfaces and substrate conditions.

3.03 INSTALLATION

A. Perform work in accordance with manufacturer's written installation instructions and applicable requirements in coordination with project attributes, paver type being installed, pattern, grid layout, starting point, and finished elevation as indicated on approved shop drawings.

B. Install pavers on pedestals in accordance with manufacturer's instructions.
   1. Fully support edges; shim and adjust pavers to provide level surface.
   2. Provide approximately 1/8 inch space between pavers to permit surface water drainage.

C. Paver Edge Restraints: Install exposed paver edge restraints in accordance with roof paver manufacturer's instructions.

D. Edge Treatment: Install dividers and edging where indicated.
   1. Provide intermittent spacing between dividers to allow water to flow between areas.
   2. Extend protection layers up vertical surfaces of dividers and edging to retain overburden.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. Inspect during installation to ensure that grid spacer lines are being maintained in a straight and consistent pattern and that deck roof pavers are level and not rocking.

C. Unless otherwise specified in writing to allow for expansion, inspect to ensure that spacing between pavers at perimeter walls does not exceed a tab width.

D. Inspect during installation to ensure that pedestrian entry or access points to roof paver areas are level and that pavers are not randomly raised or uneven creating a tripping or safety hazard.

E. Verify that deck pedestal heights in excess of 16 inches have been braced in accordance with manufacturers written installation instructions.

3.05 CLEANING

A. Remove markings from finished surfaces, or replace defaced components of roof pavers system if markings cannot be removed.

B. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and comply with their documented instructions.

C. Repair or replace defaced or damaged finishes caused by work of this section.

3.06 PROTECTION

A. Protect installed roof pavers from construction operations.

B. Where traffic must continue over finished roof pavers, protect surfaces using durable materials.

END OF SECTION 07 76 00

SECTION 07 84 00
FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Firestopping systems.

B. Firestopping of 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 07 81 00 - Applied Fire Protection.

B. Section 09 21 16 - Gypsum Board Assemblies: Gypsum wallboard fireproofing.

1.03 REFERENCE STANDARDS

A. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2024.

B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2023a.

C. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems; 2015 (Reapproved 2019).

D. ASTM E2174 - Standard Practice for On-Site Inspection of Installed Firestop Systems; 2020a.

E. ASTM E2393 - Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers; 2020a.

F. ASTM E2837 - Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed between Rated Wall Assemblies and Nonrated Horizontal Assemblies; 2023a, with Editorial Revision (2024).

G. ITS (DIR) - Directory of Listed Products; current edition.

H. FM (AG) - FM Approval Guide; Current Edition.

I. SCAQMD 1168 - Adhesive and Sealant Applications; 1989, with Amendment (2022).

J. UL 1479 - Standard for Fire Tests of Penetration Firestops; Current Edition, Including All Revisions.

K. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems; Current Edition, Including All Revisions.

L. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 01 30 00 - 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. Sustainable Design Submittal: Submit VOC content documentation for nonpreformed materials.

E. Manufacturer's qualification statement.

1.05 QUALITY ASSURANCE

A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
   1. Listing in UL (FRD), FM (AG), or ITS (DIR) will be considered as constituting an acceptable test report.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

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.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Firestopping Manufacturers:
   1. 3M Fire Protection Products; _____: www.3m.com/firestop/#sle.
   2. A/D Fire Protection Systems Inc; _____: www.adfire.com/#sle.
   3. Hilti, Inc; _____: www.hilti.com/#sle.
   4. Nelson FireStop Products; _____: www.nelsonfirestop.com/#sle.
   5. Substitutions: See Section 01 60 00 - 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. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.

2.03 FIRESTOPPING ASSEMBLY REQUIREMENTS

A. Head-of-Wall (HW) 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 wall assembly.

B. Floor-to-Floor (FF), Floor-to-Wall (FW), Head-of-Wall (HW), and Wall-to-Wall (WW) 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.

C. 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 FOR FLOOR-TO-FLOOR, FLOOR-TO-WALL, HEAD-OF-WALL, AND WALL-TO-WALL JOINTS

A. Concrete and Concrete Masonry Walls and Floors:
   1. Floor-to-Floor Joints:
      a. 2 Hour Construction: UL System FF-D-1013; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
      b. 2 Hour Construction: UL System FF-D-1085; Tremco, TREMstop Acrylic Firestop Sealant.
   2. Head-of-Wall Joints at Concrete/Concrete Masonry Wall to Concrete Over Metal Deck Floor:
      a. 2 Hour Construction: UL System HW-D-0039; Specified Technologies Inc. ES Elastomeric Firestop Sealant.
      b. 2 Hour Construction: UL System HW-D-0181; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
      c. 2 Hour Construction: UL System HW-D-1037; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
   3. Head-of-Wall Joints at Concrete/Concrete Masonry Wall to Concrete Floor:
      a. 2 Hour Construction: UL System HW-D-0268; Hilti CP 606 Flexible Firestop Sealant.
      b. 2 Hour Construction: UL System HW-D-0312; Specified Technologies Inc. SIL Silicone Sealant.

B. Gypsum Board Walls:

1. Wall-to-Wall Joints That Have Movement Capabilities (Dynamic-D):
    a. 2 Hour Construction: UL System WW-D-0180; Specified Technologies Inc. SpeedFlex TTG Track Top Gasket.
    b. 2 Hour Construction: UL System WW-D-0067; Hilti CP 606 Flexible Firestop Sealant.
    c. 1 Hour Construction: UL System WW-D-0067; Hilti CP 606 Flexible Firestop Sealant.
2. Head-of-Wall Joints at Underside of Steel Beam and Concrete Over Metal Deck Floor with Sprayed On Fireproofing:
    a. 2 Hour Construction: UL System HW-D-0252; Specified Technologies Inc. AS200 Elastomeric Spray.
    b. 2 Hour Construction: UL System HW-D-0259; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
    c. 1 Hour Construction: UL System HW-D-0259; Hilti CFS-SP WB Firestop Joint Spray and CP 672.

2.05 FIRESTOPPING PENETRATIONS THROUGH CONCRETE AND CONCRETE MASONRY CONSTRUCTION

A. Blank Openings:
1. In Floors or Walls:
    a. 2 Hour Construction: UL System C-AJ-0090; Hilti FS-ONE MAX Intumescent Firestop Sealant.
    b. 2 Hour Construction: UL System C-AJ-0015; Specified Technologies Inc. SSM Mortar.
    c. 2 Hour Construction: UL System C-AJ-0116; Specified Technologies Inc. Composite Sheet.
    d. 2 Hour Construction: UL System C-AJ-0136; Specified Technologies Inc. SSM Mortar.
    e. 2 Hour Construction: UL System C-AJ-0171; HoldRite HydroFlame 100 Intumescent Firestop Sealant.

B. Penetrations Through Floors or Walls By:
1. Multiple Penetrations in Large Openings:
    a. 2 Hour Construction: UL System C-AJ-2863; HoldRite HydroFlame 100 Intumescent Firestop Sealant.
    b. 2 Hour Construction: UL System C-AJ-8143; Hilti FS-ONE MAX Intumescent Firestop Sealant.
    c. 2 Hour Construction: UL System C-AJ-8035; Specified Technologies Inc. SSM Mortar.
    d. 2 Hour Construction: UL System C-AJ-8055; Specified Technologies Inc. SSP Firestop Putty.
    e. 2 Hour Construction: UL System C-AJ-8093; Specified Technologies Inc. SSB Intumescent Firestop Pillows.
    f. 2 Hour Construction: UL System C-AJ-8114; Specified Technologies Inc. SSM Mortar.
    g. 2 Hour Construction: UL System C-AJ-8115; Specified Technologies Inc. SSM Mortar.
    h. 2 Hour Construction: UL System C-AJ-8181; Specified Technologies Inc. Composite Sheet.
    i. 2 Hour Construction: UL System C-AJ-8220; Specified Technologies Inc. SSM Mortar.
2. Uninsulated Metallic Pipe, Conduit, and Tubing:
    a. 2 and 3 Hour Construction: UL System C-AJ-1696; HoldRite HydroFlame 200 Intumescent Firestop Sealant.
    b. 2 Hour Construction: UL System C-AJ-1090; Specified Technologies Inc. SSP Firestop Putty.

c. 2 Hour Construction: UL System C-AJ-1198; Specified Technologies Inc. SIL Silicone Sealant.
d. 2 Hour Construction: UL System C-AJ-1226; Hilti FS-ONE MAX Intumescent Firestop Sealant.
e. 2 Hour Construction: UL System C-AJ-1240; Specified Technologies Inc. LC Endothermic Firestop Sealant.
f. 2 Hour Construction: UL System C-AJ-1425; Hilti CFS-S SIL GG Firestop Silicone Sealant Gun-Grade.

3. Uninsulated Non-Metallic Pipe, Conduit, and Tubing:
   a. 2 Hour Construction: UL System C-AJ-2167; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   b. 2 Hour Construction: UL System C-AJ-2109; Hilti CP 643N/644 Firestop Collar.
   c. 2 Hour Construction: UL System C-AJ-2106; Specified Technologies Inc. SSW Wrap Strips.
   d. 2 Hour Construction: UL System C-AJ-2282; Specified Technologies Inc. SSW Wrap Strips.
   e. 2 Hour Construction: UL System C-AJ-2297; Specified Technologies Inc. SSC Collars.
   f. 2 Hour Construction: UL System C-AJ-2297; Specified Technologies Inc. SSW Wrap Strips.
   g. 2 Hour Construction: UL System C-AJ-2298; Specified Technologies Inc. LCC Intumescent Firestop Collars.
   h. 2 Hour Construction: UL System C-AJ-2588; Specified Technologies Inc. RTC Range-Taking Collar.
   i. 2 Hour Construction: UL System C-AJ-2772; Specified Technologies Inc. SSW Wrap Strips.
4. Electrical Cables Not In Conduit:
   a. 2 Hour Construction: UL System C-AJ-3213; Specified Technologies Inc. SSC Collars.
   b. 2 Hour Construction: UL System W-J-3046; Specified Technologies Inc. SSP Firestop Putty.
   c. 2 Hour Construction: UL System C-AJ-3154; Specified Technologies Inc. SSP Firestop Putty.
   d. 2 Hour Construction: UL System C-AJ-3216; Hilti CFS-PL Firestop Plug.
   e. 2 Hour Construction: UL System C-AJ-3283; Hilti CP653 Speed Sleeve.
   f. 2 Hour Construction: UL System C-AJ-3283; Hilti CFS-SL SK Firestop Sleeve Kit.
   g. 2 Hour Construction: UL System C-AJ-3283; Hilti CFS-SL SK Firestop Sleeve Kit with Hilti CFS-SL GP Gangplate.
   h. 2 Hour Construction: UL System W-J-3198; Hilti CFS-SL RK Retrofit Sleeve Kit for Existing Cables.
   i. 2 Hour Construction: UL System W-J-3199; Hilti CFS-SL SK Firestop Sleeve Kit.
5. Cable Trays with Electrical Cables:
6. Electrical Busways:
   a. 3 Hour Construction: UL System C-AJ-6017; Hilti FS-ONE MAX Intumescent Firestop Sealant.
7. Insulated Pipes:
   a. 2 Hour Construction: UL System C-AJ-5048; Hilti FS-ONE MAX Intumescent Firestop Sealant, CP 606 Flexible Firestop Sealant, CP 601S Elastomeric Firestop Sealant, CP 604 Self-Leveling Firestop Sealant or CFS-S SIL GG Firestop Silicone Sealant Gun-Grade.
   b. 2 Hour Construction: UL System C-AJ-5087; Specified Technologies Inc. SSS Intumescent Firestop Sealant.
   c. 2 Hour Construction: UL System C-AJ-5091; Hilti FS-ONE IMAX Intumescent Firestop Sealant.

d. 2 Hour Construction: UL System C-AJ-5138; Specified Technologies Inc. LCI Intumescent Firestop Sealant.
e. 2 Hour Construction: UL System C-AJ-5313; Specified Technologies Inc. LC Endothermic Firestop Sealant.
f. 2 Hour Construction: UL System C-AJ-5433; HoldRite HydroFlame 300 CG (Caulk Grade).

8. HVAC Ducts, Uninsulated:
a. 2 Hour Construction: UL System C-AJ-7111; Hilti FS-ONE MAX Intumescent Firestop Sealant.
b. 2 Hour Construction: UL System C-AJ-7224; HoldRite HydroFlame 300 SL (Floors Only), or HoldRite HydroFlame 300 CG (Walls or Floors).
c. 2 Hour Construction: UL System C-AJ-7222; HoldRite HydroFlame 300 CG (Caulk Grade).

C. Penetrations Through Floors By:
1. Multiple Penetrations in Large Openings:
a. 2 Hour Construction: UL System F-A-8012; Hilti CFS-S SIL GG Firestop Silicone Sealant Gun-Grade or CFS-S SIL SL Firestop Silicone Sealant Self-Leveling.
2. Uninsulated Metallic Pipe, Conduit, and Tubing:
a. 2 Hour Construction: UL System F-A-1016; Hilti CP 680-P/M Cast-In Device.
b. 2 Hour Construction: UL System F-A-1110; Specified Technologies Inc. CID Cast-In Device.
3. Uninsulated Non-Metallic Pipe, Conduit, and Tubing:
a. 2 and 3 Hour Construction: UL System F-A-1133; HoldRite HydroFlame HFP-Px, HFP-PxB Cast-In Device.
b. 2 Hour Construction: UL System F-A-2065; Hilti CP 680-P Cast-In Device.
c. 2 Hour Construction: UL System F-A-2213; Hilti CFS-DID Drop-In Device.
d. 2 Hour Construction: UL System F-A-2053; Hilti CP 680-P Cast-In Device.
e. 2 Hour Construction: UL System F-A-2216; Specified Technologies Inc. Closet Flange Firestop Gasket.
f. 2 Hour Construction: UL System F-A-2246; Specified Technologies Inc. CID Cast-In Device.
4. Electrical Cables Not In Conduit:
a. 2 Hour Construction: UL System F-A-3033; Hilti CP 680-P/M Cast-In Device.
b. 2 Hour Construction: UL System F-A-3032; Specified Technologies Inc. Ready Split Sleeve.
c. 2 Hour Construction: UL System F-A-3058; Specified Technologies Inc. EZ-Path Series 44 Fire-Rated Pathway.
5. Electrical Busways:
a. 2 Hour Construction: UL System F-A-6002; Hilti CP 604 Self-Leveling Firestop Sealant.
6. Insulated Pipes:
a. 2 and 3 Hour Construction: UL System F-A-5043; HoldRite HydroFlame HFP-Px, or HFP-PxB Cast-In Device.
b. 2 Hour Construction: UL System F-A-5015; Hilti CP 680-P/M Cast-In Device.
c. 2 Hour Construction: UL System F-A-5017; Hilti CP 680-P/M Cast-In Device.
d. 2 Hour Construction: UL System F-A-5041; Specified Technologies Inc. CID Cast-In Device.
e. 2 Hour Construction: UL System F-A-5045; Specified Technologies Inc. CID Cast-In Device.

D. Penetrations Through Walls By:
1. Uninsulated Metallic Pipe, Conduit, and Tubing:
a. 2 Hour Construction: UL System W-J-1067; Hilti FS-ONE MAX Intumescent Firestop Sealant.

b. 1 Hour Construction: UL System W-J-1067; Hilti FS-ONE MAX Intumescent Firestop Sealant.

2. Electrical Cables Not In Conduit:
   a. 2 Hour Construction: UL System C-AJ-3357; HoldRite HydroFlame 100 Intumescent Firestop Sealant.
   b. 2 Hour Construction: UL System C-AJ-3095; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   c. 2 Hour Construction: UL System C-AJ-3216; Hilti CFS-PL Firestop Plug.
   d. 2 Hour Construction: UL System W-J-3090; Specified Technologies Inc. SSP Firestop Putty.
   e. 2 Hour Construction: UL System W-J-3098; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.
   f. 2 Hour Construction: UL System W-J-3130; Specified Technologies Inc. EZ-Path Series 22 Fire-Rated Pathway.
   g. 2 Hour Construction: UL System W-J-3138; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.
   h. 2 Hour Construction: UL System W-J-3141; Specified Technologies Inc. Ready-Sleeve.
   i. 2 Hour Construction: UL System W-J-3156; Specified Technologies Inc. Ready Split Sleeve.
   j. 2 Hour Construction: UL System W-J-3158; Specified Technologies Inc. EZ-Path Series 44 Fire-Rated Pathway.
   k. 2 Hour Construction: UL System W-J-3180; Specified Technologies Inc. EZ-Path Series 44 Fire-Rated Pathway.
   l. 2 Hour Construction: UL System W-J-3182; Specified Technologies Inc. Ready Split Sleeve.
   m. 2 Hour Construction: UL System W-J-3182; Specified Technologies Inc. Ready-Sleeve.
3. Insulated Pipes:
   a. 2 Hour Construction: UL System C-AJ-5090; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   b. 2 Hour Construction: UL System C-AJ-5091; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   c. 2 Hour Construction: UL System C-AJ-5407; HoldRite HydroFlame 200 Intumescent Firestop Sealant.
   d. 1 Hour Construction: UL System C-AJ-5090; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   e. 1 Hour Construction: UL System C-AJ-5091; Hilti FS-ONE MAX Intumescent Firestop Sealant.
4. HVAC Ducts, Uninsulated:
   a. 3 Hour Construction: UL System C-AJ-7204; HoldRite HydroFlame 100 Intumescent Firestop Sealant.
   b. 2 Hour Construction: UL System W-J-7092; Specified Technologies Inc. FyreFlange HVAC Firestop Angle.
   c. 2 Hour Construction: UL System W-J-7109; Hilti FS-ONE MAX Intumescent Firestop Sealant, or CP 606 Flexible Firestop Sealant.
5. HVAC Ducts, Insulated:
   a. 2 Hour Construction: UL System W-J-7112; Hilti FS-ONE MAX Intumescent Firestop Sealant.

2.06 FIRESTOPPING PENETRATIONS THROUGH GYPSUM BOARD WALLS

A. Blank Openings:
   1. 2 Hour Construction: UL System W-L-0020; Specified Technologies Inc. Composite Sheet.

2. 2 Hour Construction: UL System W-L-0032; Specified Technologies Inc. FP Intumescent Firestop Plug.
3. 2 Hour Construction: UL System W-L-0038; Specified Technologies Inc. FP Intumescent Firestop Plug.
4. 2 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.
5. 1 Hour Construction: UL System W-L-0020; Specified Technologies Inc. Composite Sheet.
6. 1 Hour Construction: UL System W-L-0032; Specified Technologies Inc. FP Intumescent Firestop Plug.
7. 1 Hour Construction: UL System W-L-0038; Specified Technologies Inc. FP Intumescent Firestop Plug.
8. 1 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.

B. Penetrations By:
   1. Multiple Penetrations in Large Openings:
      a. 2 Hour Construction: UL System W-L-1408; Hilti FS-ONE MAX Intumescent Firestop Sealant.
      b. 2 Hour Construction: UL System W-L-8013; Hilti CFS-BL Firestop Block.
      c. 2 Hour Construction: UL System W-L-8025; Specified Technologies Inc. LCI Intumescent Firestop Sealant.
      d. 2 Hour Construction: UL System W-L-8050; Specified Technologies Inc. SSB Intumescent Firestop Pillows.
      e. 2 Hour Construction: UL System W-L-8071; Hilti FS-ONE MAX Intumescent Firestop Sealant.
      f. 2 Hour Construction: UL System W-L-8073; Specified Technologies Inc. Composite Sheet.
      g. 2 Hour Construction: UL System W-L-8079; Hilti FS-ONE MAX Intumescent Firestop Sealant.
      h. 1 and 2 Hour Construction: UL System W-L-1568; HoldRite HydroFlame 100 Intumescent Firestop Sealant.
      i. 1 Hour Construction: UL System W-L-1408; Hilti FS-ONE MAX Intumescent Firestop Sealant.
      j. 1 Hour Construction: UL System W-L-8013; Hilti CFS-BL Firestop Block.
      k. 1 Hour Construction: UL System W-L-8025; Specified Technologies Inc. LCI Intumescent Firestop Sealant.
      l. 1 Hour Construction: UL System W-L-8050; Specified Technologies Inc. SSB Intumescent Firestop pillows.
      m. 1 Hour Construction: UL System W-L-8071; Hilti FS-ONE MAX Intumescent Firestop Sealant.
      n. 1 Hour Construction: UL System W-L-8073; Specified Technologies Inc. Composite Sheet.
      o. 1 Hour Construction: UL System W-L-8079; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   2. Uninsulated Metallic Pipe, Conduit, and Tubing:
      a. 2 Hour Construction: UL System W-L-1033; Specified Technologies Inc. SIL Silicone Sealant.
      b. 2 Hour Construction: UL System W-L-1042; Specified Technologies Inc. WF300 Intumescent Firestop Caulk (For Wood Frame Construction).
      c. 2 Hour Construction: UL System W-L-1049; Specified Technologies Inc. SSS Intumescent Firestop Sealant.
      d. 2 Hour Construction: UL System W-L-1090; Specified Technologies Inc. LC Endothermic Firestop Sealant.
      e. 2 Hour Construction: UL System W-L-1054; Hilti FS-ONE MAX Intumescent Firestop Sealant.

f. 2 Hour Construction: UL System W-L-1164; Hilti FS-ONE MAX Intumescent Firestop Sealant.
g. 2 Hour Construction: UL System W-L-1222; Specified Technologies Inc. LCI Intumescent Firestop Sealant.
h. 2 Hour Construction: UL System W-L-1477; Specified Technologies Inc. EZ Firestop Grommet.
i. 2 Hour Construction: UL System W-L-1506; Hilti CFS-D Firestop Cable Disc.
j. 1 and 2 Hour Construction: UL System W-L-1558; HoldRite HydroFlame 100 Intumescent Firestop Sealant.
k. 1 and 2 Hour Construction: UL System W-L-1558; HoldRite HydroFlame 200 Intumescent Firestop Sealant.
l. 1 Hour Construction: UL System W-L-1042; Specified Technologies Inc. WF300 Intumescent Firestop Caulk (For Wood Frame Construction).
m. 1 Hour Construction: UL System W-L-1049; Specified Technologies Inc. SSS Intumescent Firestop Sealant.
n. 1 Hour Construction: UL System W-L-1054; Hilti FS-ONE MAX Intumescent Firestop Sealant.
o. 1 Hour Construction: UL System W-L-1090; Specified Technologies Inc. LC Endothermic Firestop Sealant.
p. 1 Hour Construction: UL System W-L-1164; Hilti FS-ONE MAX Intumescent Firestop Sealant.
q. 1 Hour Construction: UL System W-L-1222; Specified Technologies Inc. LCI Intumescent Firestop Sealant.
r. 1 Hour Construction: UL System W-L-1477; Specified Technologies Inc. EZ Firestop Grommet.
s. 1 Hour Construction: UL System W-L-1506; Hilti CFS-D Firestop Cable Disc.

3. Uninsulated Non-Metallic Pipe, Conduit, and Tubing:
a. 2 Hour Construction: UL System W-L-2048; Specified Technologies Inc. SSW Wrap Strips.
b. 2 Hour Construction: UL System W-L-2074; Specified Technologies Inc. SSC Collars.
c. 2 Hour Construction: UL System W-L-2078; Hilti CP 643N/644 Firestop Collar.
d. 2 Hour Construction: UL System W-L-2128; Hilti FS-ONE MAX Intumescent Firestop Sealant.
e. 2 Hour Construction: UL System W-L-2237; Specified Technologies Inc. LCC Intumescent Firestop Collars.
f. 2 Hour Construction: UL System W-L-2241; Specified Technologies Inc. WF300 Intumescent Firestop Caulk (For Wood Frame Construction).
g. 2 Hour Construction: UL System W-L-2243; Specified Technologies Inc. SSW Wrap Strips.
h. 2 Hour Construction: UL System W-L-2493; Specified Technologies Inc. RTC Range-Taking Collar.
i. 1 and 2 Hour Construction: UL System W-L-2710; HoldRite HydroFlame 200 Intumescent Firestop Sealant.
j. 1 Hour Construction: UL System W-L-2048; Specified Technologies Inc. SSW Wrap Strips.
k. 1 Hour Construction: UL System W-L-2074; Specified Technologies Inc. SSC Collars.
l. 1 Hour Construction: UL System W-L-2078; Hilti CP 643N/644 Firestop Collar.
m. 1 Hour Construction: UL System W-L-2128; Hilti FS-ONE MAX Intumescent Firestop Sealant.
n. 1 Hour Construction: UL System W-L-2237; Specified Technologies Inc. LCC Intumescent Firestop Collars.

o. 1 Hour Construction: UL System W-L-2241; Specified Technologies Inc. WF300 Intumescent Firestop Caulk (For Wood Frame Construction).
p. 1 Hour Construction: UL System W-L-2243; Specified Technologies Inc. SSW Wrap Strips.
q. 1 Hour Construction: UL System W-L-2493; Specified Technologies Inc. RTC Range-Taking Collar.

4. Electrical Cables Not In Conduit:
   a. 2 Hour Construction: UL System W-L-3024; Specified Technologies Inc. SSP Firestop Putty.
   b. 2 Hour Construction: UL System W-L-3065; Hilti FS-ONE MAX Intumescent Firestop Sealant, CP 606 Flexible Firestop Sealant, CD 601S Elastomeric Firestop Sealant, or CP 618 Firestop Putty Stick.
   c. 2 Hour Construction: UL System W-L-3076; Specified Technologies Inc. SSS Intumescent Firestop Sealant.
   d. 2 Hour Construction: UL System W-L-3084; Specified Technologies Inc. SSB Intumescent Firestop Pillows.
   e. 2 Hour Construction: UL System W-L-3135; Specified Technologies Inc. SSP Firestop Putty.
   f. 2 Hour Construction: UL System W-L-3169; Specified Technologies Inc. LCI Intumescent Firestop Sealant.
   g. 2 Hour Construction: UL System W-L-3218; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.
   h. 2 Hour Construction: UL System W-L-3255; Specified Technologies Inc. EZ-Path Series 22 Fire-Rated Pathway.
   i. 2 Hour Construction: UL System W-L-3256; Specified Technologies Inc. EZ-Path Series 22 Fire-Rated Pathway.
   j. 2 Hour Construction: UL System W-L-3265; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.
   k. 2 Hour Construction: UL System W-L-3303; Specified Technologies Inc. Ready Split Sleeve.
   l. 2 Hour Construction: UL System W-L-3306; Specified Technologies Inc. EZ-Path Series 44 Fire-Rated Pathway.
   m. 2 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.
   n. 2 Hour Construction: UL System W-L-3350; Specified Technologies Inc. LC Endothermic Firestop Sealant.
   o. 2 Hour Construction: UL System W-L-3357; Specified Technologies Inc. FP Intumescent Firestop Plug.
   p. 2 Hour Construction: UL System W-L-3358; Specified Technologies Inc. Ready Split Sleeve.
   q. 2 Hour Construction: UL System W-L-3358; Specified Technologies Inc. Ready-Sleeve.
   r. 2 Hour Construction: UL System W-L-3369; Specified Technologies Inc. EZ Firestop Grommet.
   s. 2 Hour Construction: UL System W-L-3370; Specified Technologies Inc. EZ Firestop Grommet.
   t. 2 Hour Construction: UL System W-L-3374; Specified Technologies Inc. FP Intumescent Firestop Plug.
   u. 2 Hour Construction: UL System W-L-3376; Specified Technologies Inc. Ready-Sleeve.
   v. 2 Hour Construction: UL System W-L-3377; Specified Technologies Inc. EZ-Path Series 22 Fire-Rated Pathway.
   w. 2 Hour Construction: UL System W-L-3377; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.

x. 2 Hour Construction: UL System W-L-3378; Specified Technologies Inc. EZ Firestop Grommet.
y. 2 Hour Construction: UL System W-L-3379; Specified Technologies Inc. EZ Firestop Grommet.
z. 2 Hour Construction: UL System W-L-3390; Specified Technologies Inc. EZ-Path Series 44 Fire-Rated Pathway.
aa. 2 Hour Construction: UL System W-L-3393; Hilti CFS-SL RK Retrofit Sleeve Kit for Existing Cables.
bb. 2 Hour Construction: UL System W-L-3395; Hilti CP653 Speed Sleeve.
cc. 2 Hour Construction: UL System W-L-3395; Hilti CFS-SL SK Firestop Sleeve Kit.
dd. 2 Hour Construction: UL System W-L-3395; Hilti CFS-SL SK Firestop Sleeve Kit with Hilti CFS-SL GP Gangplate.
ee. 2 Hour Construction: UL System W-L-3414; Hilti CFS-D Firestop Cable Disc.
ff. 1 and 2 Hour Construction: UL System W-L-3453; HoldRite HydroFlame 200 Intumescent Firestop Sealant.
gg. 1 Hour Construction: UL System W-L-3024; Specified Technologies Inc. SSP Firestop Putty.
hh. 1 Hour Construction: UL System W-L-3065; Hilti FS-ONE MAX Intumescent Firestop Sealant, CP 606 Flexible Firestop Sealant, CD 601S Elastomeric Firestop Sealant, or CP 618 Firestop Putty Stick.
ii. 1 Hour Construction: UL System W-L-3076; Specified Technologies Inc. SSS Intumescent Firestop Sealant.
jj. 1 Hour Construction: UL System W-L-3084; Specified Technologies Inc. SSB Intumescent Firestop Pillows.
kk. 1 Hour Construction: UL System W-L-3135; Specified Technologies Inc. SSP Firestop Putty.
ll. 1 Hour Construction: UL System W-L-3169; Specified Technologies Inc. LCI Intumescent Firestop Sealant.
mm. 1 Hour Construction: UL System W-L-3218; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.
nn. 1 Hour Construction: UL System W-L-3255; Specified Technologies Inc. EZ-Path Series 22 Fire-Rated Pathway.
oo. 1 Hour Construction: UL System W-L-3256; Specified Technologies Inc. EZ-Path Series 22 Fire-Rated Pathway.
pp. 1 Hour Construction: UL System W-L-3265; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.
qq. 1 Hour Construction: UL System W-L-3303; Specified Technologies Inc. Ready Split Sleeve.
rr. 1 Hour Construction: UL System W-L-3306; Specified Technologies Inc. EZ-Path Series 44 Fire-Rated Pathway.
ss. 1 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.
tt. 1 Hour Construction: UL System W-L-3350; Specified Technologies Inc. LC Endothermic Firestop Sealant.
uu. 1 Hour Construction: UL System W-L-3357; Specified Technologies Inc. FP Intumescent Firestop Plug.
vv. 1 Hour Construction: UL System W-L-3358; Specified Technologies Inc. Ready Split Sleeve.
ww. 1 Hour Construction: UL System W-L-3358; Specified Technologies Inc. Ready-Sleeve.
xx. 1 Hour Construction: UL System W-L-3369; Specified Technologies Inc. EZ Firestop Grommet.
yy. 1 Hour Construction: UL System W-L-3370; Specified Technologies Inc. EZ Firestop Grommet.

zz. 1 Hour Construction: UL System W-L-3374; Specified Technologies Inc. FP Intumescent Firestop Plug.
aaa. 1 Hour Construction: UL System W-L-3376; Specified Technologies Inc. Ready-Sleeve.
bbb. 1 Hour Construction: UL System W-L-3377; Specified Technologies Inc. EZ-Path Series 22 Fire-Rated Pathway.
ccc. 1 Hour Construction: UL System W-L-3377; Specified Technologies Inc. EZ-Path Series 33 Fire-Rated Pathway.
ddd. 1 Hour Construction: UL System W-L-3378; Specified Technologies Inc. EZ Firestop Grommet.
eee. 1 Hour Construction: UL System W-L-3379; Specified Technologies Inc. EZ Firestop Grommet.
fff. 1 Hour Construction: UL System W-L-3390; Specified Technologies Inc. EZ-Path Series 44 Fire-Rated Pathway.
ggg. 1 Hour Construction: UL System W-L-3393; Hilti CFS-SL RK Retrofit Sleeve Kit for Existing Cables.
hhh. 1 Hour Construction: UL System W-L-3414; Hilti CFS-D Firestop Cable Disc.

5. Cable Trays with Electrical Cables:
   a. 2 Hour Construction: UL System W-L-4008; Specified Technologies Inc. SSB Intumescent Firestop Pillows.
   b. 2 Hour Construction: UL System W-L-4011; Hilti CFS-BL Firestop Block.
   c. 2 Hour Construction: UL System W-L-4060; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   d. 1 Hour Construction: UL System W-L-4008; Specified Technologies Inc. SSB Intumescent Firestop Pillows.
   e. 1 Hour Construction: UL System W-L-4011; Hilti CFS-BL Firestop Block.
   f. 1 Hour Construction: UL System W-L-4060; Hilti FS-ONE MAX Intumescent Firestop Sealant.
6. Insulated Pipes:
   a. 2 Hour Construction: UL System W-L-5014; Specified Technologies Inc. SSS Intumescent Firestop Sealant.
   b. 2 Hour Construction: UL System W-L-5028; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   c. 2 Hour Construction: UL System W-L-5029; Hilti FS-ONE Intumescent Firestop Sealant.
   d. 2 Hour Construction: UL System W-L-5121; Specified Technologies Inc. LCI Intumescent Firestop Sealant.
   e. 2 Hour Construction: UL System W-L-5273; Specified Technologies Inc. LC Endothermic Firestop Sealant.
   f. 2 Hour Construction: UL System W-L-5298; Specified Technologies Inc. WF300 Intumescent Firestop Caulk (For Wood Frame Construction).
   g. 1 Hour Construction: UL System W-L-5014; Specified Technologies Inc. SSS Intumescent Firestop Sealant.
   h. 1 Hour Construction: UL System W-L-5028; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   i. 1 Hour Construction: UL System W-L-5029; Hilti FS-ONE Intumescent Firestop Sealant.
   j. 1 Hour Construction: UL System W-L-5121; Specified Technologies Inc. LCI Intumescent Firestop Sealant.
   k. 1 Hour Construction: UL System W-L-5273; Specified Technologies Inc. LC Endothermic Firestop Sealant.
   l. 1 Hour Construction: UL System W-L-5298; Specified Technologies Inc. WF300 Intumescent Firestop Caulk (For Wood Frame Construction).

m. 1 and 2 Hour Construction: UL System W-L-5357; HoldRite HydroFlame 200 Intumescent Firestop Sealant.

7. HVAC Ducts, Insulated:
   a. 2 Hour Construction: UL System W-L-7156; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   b. 2 Hour Construction: UL System W-L-7164; Specified Technologies Inc. FyreFlange HVAC Firestop Angle.
   c. 2 Hour Construction: UL System W-L-7238; Specified Technologies Inc. FyreFlange HVAC Firestop Angle.
   d. 1 Hour Construction: UL System W-L-7164; Specified Technologies Inc. FyreFlange HVAC Firestop Angle.
   e. 1 Hour Construction: UL System W-L-7238; Specified Technologies Inc. FyreFlange HVAC Firestop Angle.
   f. 1 Hour Construction: UL System W-L-7156; Hilti FS-ONE MAX Intumescent Firestop Sealant.

2.07 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.

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.

3.03 INSTALLATION

A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

3.04 FIELD QUALITY CONTROL

A. Independent Testing Agency: Inspection agency employed and paid by Owner, will examine penetration firestopping in accordance with ASTM E2174 and ASTM E2393.

B. Repair or replace penetration firestopping and joints at locations where inspection results indicate firestopping or joints do not meet specified requirements.

END OF SECTION 07 84 00

SECTION 07 92 00
JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Self-leveling pourable joint sealants.

C. Joint backings and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 25 00 - Weather Barriers: Sealants required in conjunction with water-resistive barriers.

B. Section 07 84 00 - Firestopping: Firestopping sealants.

C. Section 07 95 13 - Expansion Joint Cover Assemblies: Sealants forming part of expansion joint cover assemblies.

D. Section 08 71 00 - Door Hardware: Setting exterior door thresholds in sealant.

E. Section 08 80 00 - Glazing: Glazing sealants and accessories.

F. Section 09 21 16 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.

G. Section 09 30 00 - Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.

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 C794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants; 2018 (Reapproved 2022).

C. ASTM C834 - Standard Specification for Latex Sealants; 2017 (Reapproved 2023).

D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).

E. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2025.

F. ASTM C1311 - Standard Specification for Solvent Release Sealants; 2022.

G. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015 (Reapproved 2021).

H. SCAQMD 1168 - Adhesive and Sealant Applications; 1989, with Amendment (2022).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
   1. Substrates for which use of primer is required.
   2. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
   3. Sample product warranty.
   4. Certification by manufacturer indicating that product complies with specification requirements.

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. Installation Plan: Submit at least four weeks prior to start of installation.

G. Preinstallation Field Adhesion Test Plan: Submit at least two weeks prior to start of installation.

H. Preinstallation Field Adhesion Test Reports: Submit filled out Preinstallation Field Adhesion Test Reports log within 10 days after completion of tests; include bagged test samples and photographic records.

I. Installation Log: Submit filled out log for each length or instance of sealant installed.

1.05 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 and with at least three years of documented experience.

C. Installation Plan: Include schedule of sealed joints, including the following.
   1. Method to be used to protect adjacent surfaces from sealant droppings and smears, with acknowledgement that some surfaces cannot be cleaned to like-new condition and therefore prevention is imperative.
   2. Approximate date of installation, for evaluation of thermal movement influence.
   3. Installation Log Form: Include the following data fields, with known information filled out.
      a. Date of installation.
      b. Name of installer.
      c. Actual joint width; provide space to indicate maximum and minimum width.
      d. Actual joint depth to face of backing material at centerline of joint.
      e. Air temperature.

1.06 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Correct defective work within a five year period after Date of Substantial Completion.

C. Warranty: 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. Non-Sag Sealants: Permits application in joints on vertical surfaces without sagging or slumping.
   1. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
   2. Dow Corning Corporation: www.dowcorning.com/construction
   3. Momentive Performance Materials, Inc; www.momentive.com
   4. Tremco Global Sealants: www.tremcosealants.com.
   5. Sika Corporation: www.usa-sika.com.
   6. Substitutions: See Section 01 60 00 - Product Requirements.

B. Self-Leveling Sealants: Pourable or self-leveling sealant that has sufficient flow to form a smooth, level surface when applied in a horizontal joint.
   1. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
   2. Dow Corning Corporation: www.dowcorning.com/construction/sle.
   3. Tremco Global Sealants: www.tremcosealants.com.
   4. Sika Corporation: www.usa-sika.com.

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, the following items.
      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.
      c. Other joints indicated below.
   3. Do not seal the following types of joints.
      a. Intentional weepholes 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 between suspended panel ceilings/grid and walls.

B. Exterior Joints: Use non-sag non-staining silicone sealant, unless otherwise indicated.
   1. Lap Joints in Sheet Metal Fabrications: Butyl rubber, non-curing.
   2. Control and Expansion Joints in Concrete Paving: Self-leveling polyurethane "traffic-grade" sealant.

C. Interior Joints: Use non-sag polyurethane sealant, unless otherwise indicated.
   1. Wall and Ceiling Joints in Non-Wet Areas: Acrylic emulsion latex sealant.
   2. Wall and Ceiling Joints in Wet Areas: Non-sag polyurethane sealant for continuous liquid immersion.
   3. Floor Joints in Wet Areas: Non-sag polyurethane "non-traffic-grade" sealant suitable for continuous liquid immersion.
   4. Joints between Fixtures in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; white.
   5. Narrow Control Joints in Interior Concrete Slabs: Self-leveling epoxy sealant.

D. Interior Wet Areas: restrooms, kitchens, and food service areas; fixtures in wet areas include plumbing fixtures, food service equipment, countertops, cabinets, and other similar items.

2.03 JOINT SEALANTS - GENERAL

A. Sealants and Primers: Provide products having lower volatile organic compound (VOC) content than indicated in SCAQMD 1168.

2.04 NONSAG JOINT SEALANTS

A. Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus 50 percent, minimum.
   2. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
   3. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.
   4. Color: To be selected by Architect from manufacturer's full range.

B. Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.

1. Color: White.

C. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus 50 percent, minimum.
   2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
   3. Color: To be selected by Architect from manufacturer's full range.
   4. Service Temperature Range: Minus 40 to 180 degrees F.

D. Polyurethane Sealant for Continuous Water Immersion: ASTM C920, Grade NS, Uses M and A; single or multi-component; explicitly approved by manufacturer for continuous water immersion; suitable for traffic exposure when recessed below traffic surface .
   1. Movement Capability: Plus and minus 35 percent, minimum.
   2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
   3. Color: To be selected by Architect from manufacturer's standard range.
   4. Service Temperature Range: Minus 40 to 180 degrees F.

E. Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.
   1. Color: To be selected by Architect from manufacturer's full range.
   2. Grade: ASTM C834; Grade 0 Degrees F (Minus 18 Degrees C).

F. Non-Curing Butyl Sealant: Solvent-based; ASTM C1311; single component, non-sag, non-skinning, non-hardening, non-bleeding; vapor-impermeable; intended for fully concealed applications.

2.05 SELF-LEVELING SEALANTS

A. 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: To be selected by Architect from manufacturer's full range.
   4. Service Temperature Range: Minus 40 to 180 degrees F.

B. Semi-Rigid Self-Leveling Epoxy Joint Filler: Epoxy or epoxy/polyurethane copolymer; intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic.
   1. Composition: Multi-component, 100 percent solids by weight.
   2. Durometer Hardness: Minimum of 85 for Type A or 35 for Type D, after seven days when tested in accordance with ASTM D2240.
   3. Color: Concrete gray.
   4. Joint Width, Minimum: 1/8 inch.
   5. Joint Width, Maximum: 1/4 inch.
   6. Joint Depth: Provide product suitable for joints from 1/8 inch to 2 inches in depth including space for backer rod.

2.06 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. Open Cell: 40 to 50 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, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

D. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.

E. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

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.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Perform 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.

3.04 POST-OCCUPANCY

A. Post-Occupancy Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width; i.e. at low temperature in thermal cycle. Report failures immediately and repair.

END OF SECTION 07 92 00

SECTION 07 95 13
EXPANSION JOINT COVER ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Expansion joint cover assemblies for wall, ceiling, and soffit surfaces.

1.02 RELATED REQUIREMENTS

A. Section 04 20 00 - Unit Masonry: Placement of joint cover assembly frames in masonry.

B. Section 04 26 13 - Masonry Veneer: Placement of joint cover assembly frames in masonry.

C. Section 07 62 00 - Sheet Metal Flashing and Trim: Roof expansion and control joint covers.

D. Section 07 91 00 - Preformed Joint Seals: Sealing expansion and control joints using preformed joint seals.

E. Section 07 92 00 - Joint Sealants: Sealing expansion and control joints using gunnable and pourable sealants.

F. Section 09 21 16 - Gypsum Board Assemblies: Gypsum board control joint trim.

G. Section 09 21 16 - Gypsum Board Assemblies: Placement of expansion joint assemblies in gypsum board walls and ceilings.

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 B308/B308M - Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles; 2020.

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 30 00 - 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, affected adjacent construction and anchorage locations.

D. Samples: Submit two samples 12 inch long, illustrating profile, dimension, color, and finish selected.

E. Manufacturer's Installation Instructions: Indicate rough-in sizes and required tolerances for item placement.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Expansion Joint Cover Assemblies:
   1. Construction Specialties, Inc: www.c-sgroup.com/#sle.
   2. Inpro: www.inprocorp.com/#sle.
   3. MM Systems Corp: www.mmsystemscorp.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 EXPANSION JOINT COVER ASSEMBLY APPLICATIONS

A. Interior Floor Joints between new and existing construction:
   1. Manufacturers:
      a. Construction Specialties, Inc; APF Series: www.c-sgroup.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

B. Interior Wall/Ceiling Joints between new and existing construction:
   1. Manufacturers:
      a. Construction Specialties, Inc; ASM & ASMC Series: www.c-sgroup.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

C. Interior Fire-Rated Wall/Ceiling Joints Subject to Seismic Movement:
   1. Manufacturers:
      a. MM Pyro Flex Fire Barrier with Aluminum Cover.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

D. Exterior Wall Joints Subject to Seismic Movement:
   1. Manufacturers:
      a. MM ColorJoint / ESS Series.
      b. Substitutions: See Section 01 60 00 - 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.

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.

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 at Floors: Mill finish or natural anodized.
   2. Exposed Finish at Walls and Ceilings: To be selected from manufacturers full line.

B. Resilient Seals:

C. Backing Paint for Aluminum Components in Contact with Cementitious Materials: Asphaltic type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joint preparation and dimensions are acceptable and in accordance with manufacturer's requirements.

3.02 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.

3.03 PROTECTION

A. Do not permit traffic over unprotected floor joint surfaces.

SECTION 08 11 13
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. Tornado-resistant hollow metal doors and frames.

F. Hollow metal borrowed lites glazing frames.

1.02 RELATED REQUIREMENTS

A. Section 08 71 00 - Door Hardware.

B. Section 08 80 00 - Glazing: Glass for doors and borrowed lites.

C. Section 09 91 13 - Exterior Painting: Field painting.

D. Section 09 91 23 - Interior Painting: Field painting.

1.03 ABBREVIATIONS AND ACRONYMS

A. ANSI: American National Standards Institute.

B. ASCE: American Society of Civil Engineers.

C. HMMA: Hollow Metal Manufacturers Association.

D. NAAMM: National Association of Architectural Metal Manufacturers.

E. NFPA: National Fire Protection Association.

F. SDI: Steel Door Institute.

G. UL: Underwriters Laboratories.

1.04 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2024.

C. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames; 2024.

D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2023.

E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2025.

F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

G. 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; 2024.

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 C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.

J. ASTM C476 - Standard Specification for Grout for Masonry; 2023.

K. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.

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 (Reapproved 2021).

M. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames; 2016.

N. ICC 500 - ICC/NSSA Standard for the Design and Construction of Storm Shelters; 2020.

O. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

P. ITS (DIR) - Directory of Listed Products; Current Edition.

Q. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.

R. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2024.

S. NAAMM HMMA 840 - Guide Specifications for Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2024.

T. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2014.

U. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025.

V. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.

W. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2023.

X. UL (DIR) - Online Certifications Directory; Current Edition.

Y. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.05 SUBMITTALS

A. See Section 01 30 00 - 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.

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.

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.

1.07 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.
   2. Curries, an Assa Abloy Group company: www.assaabloydss.com/#sle.
   3. Philipp Manufacturing: www.philipp-mfg.com.

4. Republic Doors, an Allegion brand: www.republicdoor.com/#sle.
5. Steelcraft, an Allegion brand; ____: www.allegion.com/#sle.
6. Substitutions: See Section 01 60 00 - Product Requirements.

B. Tornado-Resistant Hollow Metal Doors and Frames:
1. Krieger Specialty Products: www.kriegerproducts.com/#sle.
2. Megamet Industries, Inc: www.megametusa.com/#sle.
3. Republic Doors, an Allegion brand: www.republicdoor.com/#sle.
4. Substitutions: See Section 01 60 00 - 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; galvannealed 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 and ADA Standards.
3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
4. Door Edge Profile: Manufacturers standard for application indicated.
5. Typical Door Face Sheets: Flush.
6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturer's standard.
7. 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.
8. 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) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.

B. 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.

2.03 HOLLOW METAL DOORS

A. Minimum Hardware Reinforcing for Steel Doors:
1. Butts and Pivots: 7 gauge steel; Full interior width at door by 10-inches long at each location.
2. Closers: Inverted steel channel; 6-inch sides by 18 inches long.
3. Locks: 12 gauge steel; Size to template.
4. Surface Applied Hardware: 12 gauge steel; Size to template.

B. Exterior Doors: Thermally insulated.
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
a. Level 3 - Extra Heavy-duty.
b. Physical Performance Level A 1 000 000 cycles; in accordance with ANSI/SDI A250.4.
c. Model 1 - Full Flush.
d. Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.
e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
2. Door Core Material: Polystyrene, 1 lbs/cu ft minimum density.

a. Foam Plastic Insulation: Manufacturer's standard board insulation with maximum flame spread index (FSI) of 75, and maximum smoke developed index (SDI) of 450 in accordance with ASTM E84, and completely enclosed within interior of door.

3. Door Thermal Resistance: R-Value of 6.0 minimum, for installed thickness of polystyrene.
4. Door Thickness: 1-3/4 inches, nominal.
5. Weatherstripping: Refer to Section 08 71 00.
6. Door Finish: Factory primed and field finished.

C. Interior Doors, Non-Fire Rated:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
a. Level 3 - Extra Heavy-duty.
b. Physical Performance Level A 1 000 000 cycles; in accordance with ANSI/SDI A250.4.
c. Model 1 - Full Flush.
d. Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.
2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
3. Door Thickness: 1-3/4 inches, nominal.
4. Door Finish: Factory primed and field finished.

D. Fire-Rated Doors:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
a. Level 3 - Extra Heavy-duty.
b. Physical Performance Level A 1 000 000 cycles; in accordance with ANSI/SDI A250.4.
c. Model 1 - Full Flush.
d. Door Face Metal Thickness: 16 gage, 0.053 inch, minimum.
e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
3. Temperature-Rise Rating (TRR) Across Door Thickness: In accordance with local building code and authorities having jurisdiction.
4. Provide units listed and labeled by UL (DIR) or ITS (DIR).
a. Attach fire rating label to each fire rated unit.
5. Door Core Material: Mineral board.
6. Door Thickness: 1-3/4 inches, nominal.
7. Door Finish: Factory primed and field finished.

E. Exterior ,Tornado-Resistant Doors: Provide fire-rated door construction as indicated for door Type x , Fire-Rated Doors, and the following hurricane resistant door requirements.
1. Design and size door and frame components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M.
a. Design Wind Loads: Comply with requirements of authorities having jurisdiction.
b. Wind-Borne Debris Resistance: Door and frame components shall have UL (DIR) approval or ICC-500 for Large and Small Missile impact and pressure cycling at design wind loads.
2. Tornado Shelter Application: Comply with ICC 500 standard.
3. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
a. Level 3 - Extra Heavy-duty.
b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
c. Model 1 - Full Flush.
d. Door Face Metal Thickness: 16 gauge, 0.053 inch, minimum.
e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.

4. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
5. Door Thermal Resistance: R-Value of 6.0 minimum, for installed thickness of polystyrene.
6. Door Thickness: 1-3/4 inches, nominal.
7. Door Finish: Factory primed and field finished.

2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Minimum Hardware Reinforcing for Steel Frames:
1. Butts and Pivots: 1/4" thick steel plate; Full interior width at frame by 10-inches long at each location.
2. Closers: 12 gauge steel; 6-inch sides by 18 inches long.
3. Locks: 12 gauge steel; Size to template.
4. Surface Applied Hardware: 12 gauge steel; Size to template.
5. Dust Covers: 20 gauge steel: Full length of frame.

C. Exterior Door Frames: Full profile/continuously welded type.
1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A40/ZF120 coating.
2. Frame Metal Thickness: 14 gage, 0.067 inch, minimum.
3. Frame Finish: Factory primed and field finished.
4. Weatherstripping: Separate, see Section 08 71 00.

D. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
1. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.
2. Frame Finish: Factory primed and field finished.

E. Door Frames, Fire-Rated: Full profile/continuously welded type.
1. Fire Rating: Same as door, labeled.
2. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.
3. Frame Finish: Factory primed and field finished.

F. Tornado-Resistant Door Frames: With same tornado resistance as door; full profile/continuously welded construction, ground smooth, fully prepared and reinforced for hardware installation.
1. Frame Metal Thickness: 14 gauge, 0.067 inch, minimum.
2. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A40/ZF120 coating.
3. Frame Finish: Factory primed and field finished.

G. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.

H. Mullions for Pairs of Doors: Removable type, with profile similar to jambs.

I. Borrowed Lites Glazing Frames: Construction and face dimensions to match door frames, and as indicated on drawings.

J. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.

K. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.

2.05 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

B. Bituminous Coating: Ultra-high build asphalt emulsion, single-component, water-proof coating in compliance with MIL-C-18480-B. Apply wet to 18.0 mils in one or two coats. Total dry film thickness of not less than 12 mils or in excess of 30 mils.

1. Provide coating on the inside face of all exterior steel frames to minimally cover the bottom 18 inches of the frame.

2.06 ACCESSORIES

A. Glazing: As specified in Section 08 80 00, factory installed.

B. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.

C. Astragals for Double Doors: Specified in Section 08 71 00.

D. Grout for Frames: Mortar grout complying with ASTM C476 with maximum slump of 4 inches as measured in accordance with ASTM C143/C143M for hand troweling in place; plaster grout and thinner pumpable grout are prohibited.

E. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

F. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

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.

B. Coat inside of other frames with bituminous coating to a thickness of 1/16 inch.

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. Install door hardware as specified in Section 08 71 00.
   1. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861.

F. Comply with glazing installation requirements of Section 08 80 00.

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 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.

3.06 SCHEDULE

A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION 08 11 13

SECTION 08 14 16
FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flush wood doors; flush and flush glazed configuration; fire-rated and non-rated.

1.02 RELATED REQUIREMENTS

A. Section 08 11 13 - Hollow Metal Doors and Frames.

B. Section 08 71 00 - Door Hardware.

C. Section 08 80 00 - Glazing.

1.03 REFERENCE STANDARDS

A. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2025.

B. AWI (QCP) - Quality Certification Program; Current Edition.

C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

E. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

F. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.

G. UL (DIR) - Online Certifications Directory; Current Edition.

H. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

I. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

J. WDMA I.S. 1A - Interior Architectural Wood Flush Doors; 2021, with Errata (2022).

1.04 SUBMITTALS

A. See Section 01 30 00 - 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. Selection Samples: Submit manufacturer's printed literature identifying all colors/finishes available for initial color selection.

E. Verification Samples: Submit two samples of panel, 12 by 12 inch size illustrating wood grain, stain color and sheen.

F. Manufacturer's Installation Instructions: Indicate special installation instructions.

G. Warranty, executed in Owner's name.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three 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.

B. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard.

B. Accept doors on site in manufacturer's packaging, and inspect for damage.

C. 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.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Interior Doors: Provide manufacturer's warranty for the life of the installation.

C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wood Veneer Faced Doors:
   1. Eggers Industries: www.eggersindustries.com/#sle.
   2. Graham Wood Doors: www.grahamdoors.com/#sle.
   3. VT Industries, Inc: www.vtindustries.com/#sle.
   4. Substitutions: See Section 01 60 00 - 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) or AWMAC/WI (NAAWS), unless noted otherwise.
   2. Wood Veneer 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 indicated on drawings in accordance with UL 10C - Positive Pressure; Underwriters Laboratories Inc (UL) or Intertek/Warnock Hersey (WHI) labeled without any visible seals when door is open.
   3. Wood veneer facing with factory transparent finish as indicated on drawings.

2.03 DOOR AND PANEL CORES

A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.

B. Fire-Rated Doors: Mineral core type, with 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.

2.04 DOOR FACINGS

A. Veneer Facing for Transparent Finish: White Maple, veneer grade in accordance with quality standard indicated, quarter cut, with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face.
   1. Vertical Edges: Same species as face veneer.
   2. "Pair Match" each pair of doors; "Set Match" pairs of doors within 10 feet of each other when doors are closed.

B. 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 for hardware reinforcement.

2. Provide solid blocking for other throughbolted hardware.

C. Glazed Openings: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.

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. Provide edge clearances in accordance with the quality standard specified.

2.06 FINISHES - WOOD VENEER DOORS

A. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
   1. Transparent:
      a. System - 1, Lacquer, Nitrocellulose.
      b. Stain: As selected by Architect.
      c. Sheen: Flat.

B. Factory finish doors in accordance with sample to be provided.

C. Seal door top edge with color sealer to match door facing.

2.07 ACCESSORIES

A. Hollow Metal Door Frames: See Section 08 11 13.

B. Glazing: See Section 08 80 00.

C. Glazing Stops: Wood, of same species as door facing, butted corners; prepared for countersink style tamper proof screws.

D. Door Hardware: See Section 08 71 00.

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.

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.

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 08 14 16

SECTION 08 31 00
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall- and ceiling-mounted access units.

1.02 RELATED REQUIREMENTS

A. Section 08 71 00 - Door Hardware: Mortise cylinder and core hardware.

B. Section 09 91 23 - Interior Painting: Field paint finish.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.

C. Manufacturer's Installation Instructions: Indicate installation requirements.

D. Manufacturer's qualification statement.

PART 2 PRODUCTS

2.01 ACCESS DOORS AND PANELS ASSEMBLIES

A. Wall-Mounted Units in Wet Areas:
   1. Location: (1) Access panel per toilet room.
   2. Panel Material: Stainless steel.
   3. Size: 24 by 24 inches.
   4. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
   5. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.
   6. Gypsum Board 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. Ceiling-Mounted Units:
   1. Size - Lay-In Grid Ceilings: To match module of ceiling grid.
   2. Size - Other Ceilings: 24 inch by 24 inch.

2.02 WALL- AND CEILING-MOUNTED ACCESS UNITS

A. Manufacturers:
   1. Activar Construction Products Group, Inc. - JL Industries: www.activarcpg.com/#sle.
   2. ACUDOR Products Inc: www.acudor.com/#sle.
   3. Babcock-Davis: www.babcockdavis.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings are correctly sized and located.

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 08 31 00

SECTION 08 32 00
SLIDING GLASS DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Factory fabricated sliding glazed doors with frames and operating hardware.

1.02 RELATED REQUIREMENTS

A. Section 05 50 00 - Metal Fabrications: Steel lintels.

B. Section 06 10 00 - Rough Carpentry: Rough opening framing.

C. Section 07 92 00 - Joint Sealants: Sealing joints between door frames and adjacent construction.

D. Section 08 71 00 - Door Hardware.

E. Section 08 80 00 - Glazing: Product and execution requirements for glass type and installation.

F. Section 09 91 23 - Interior Painting: Finishing sliding wood doors.

1.03 REFERENCE STANDARDS

A. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights; 2022, with Errata (2023).

B. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum; 2025.

C. AAMA 1801 - Voluntary Specification for the Acoustical Rating of Exterior Windows, Doors, Skylights and Glazed Wall Sections; 2021.

D. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

E. ASTM E413 - Classification for Rating Sound Insulation; 2022.

F. ASTM E1332 - Standard Classification for Rating Outdoor-Indoor Sound Attenuation; 2022.

G. ASTM E1425 - Standard Practice for Determining the Acoustical Performance of Windows, Doors, Skylight, and Glazed Wall Systems; 2014 (Reapproved 2023).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide component dimensions.

C. Shop Drawings: Indicate opening dimensions, elevations of different types, and framed opening tolerances.

D. Manufacturer's Installation Instructions: Include complete preparation, installation, and cleaning requirements.

1.05 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 type specified in this section, with at least three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to project site and store in manufacturer's protective cartons until openings are ready for door installation.

B. Protect finished surfaces with wrapping paper or strippable coating during installation. Do not use adhesive papers or sprayed coatings that bond to substrate when exposed to sunlight or weather.

1.07 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F.

B. Maintain this minimum temperature during and 24 hours after installation of sealants.

1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Correct defective work within a 2-year period after Date of Substantial Completion.

C. Manufacturer Warranty: Provide 5-year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units. Complete forms in Owner's name and register with manufacturer.

D. Manufacturer Warranty: Provide 10-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking. Complete forms in Owner's mane and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Interior Sliding Door Systems:
   1. AD Systems, an Allegion brand; Officeslide: www.specadsystems.com/#sle.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 SLIDING GLASS DOORS

A. Interior Sliding Door Systems: Aluminum cased frame with receiving channel, adjustable top track assembly along with carriage assemblies; provide frames with integral double seal full gasketing; provide factory prepped locks and other related components in frame system.
   1. Configuration: As indicated on drawings.
   2. Finish: Wood veneer wrap, species maple.
   3. Door Type: As indicated on drawings.
   4. Door Thickness: 1-3/4 inches.
   5. Wall Thickness: 4-7/8 inches.
   6. Glass Stops: Same material and color as frame, sloped for wash.
   7. Operable Panels: Adjustable, with stainless steel bottom rollers.
   8. Weight Rating: Door carriage assembly rated for 220 pounds or greater.
   9. Sound Rated Assemblies: Sound transmission class (STC) rating of 35, minimum.
   10. Hardware: See Section 08 71 00

B. Construction: Factory assemble door frame as one unit, including head jambs, and sill; factory assemble operating and fixed panels.
   1. Sizes: Allow for tolerances of rough framed openings, clearances, and shims around perimeter of assemblies.
   2. Joints and Connections: Flush, hairline width, and waterproof; accurately and rigidly joined corners.
   3. Sills: One piece, sloped to drain, with integral roller track.

2.03 COMPONENTS

A. Door Product Type: SD - Sliding door, in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.

B. Glass and Glazing Materials: See Section 08 80 00.

2.04 PERFORMANCE REQUIREMENTS

A. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.

B. Acoustical Performance: STC rating of 35, OITC rating of ___ , when tested in accordance with ASTM E90, ASTM E1425, or AAMA 1801 and ratings derived from ASTM E413 and ASTM E1332, respectively.

2.05 ASSEMBLY

A. Factory assemble door frame as one unit, including head, jambs, and sill; factory assemble operating and fixed panels.

B. Sizes: Allow for tolerances of rough framed openings, clearances, and shims around perimeter of assemblies.

C. Joints and Connections: Flush, hairline width, and waterproof; accurately and rigidly joined corners.

D. Sills: One piece, sloped to drain, with integral roller track.

2.06 ALUMINUM FINISHES

A. Color: To be selected by Architect from manufacturer's standard range.

2.07 ACCESSORIES

A. Pull Handles: Manufacturer's standard type.
   1. Color: As selected by Architect from manufacturer's standard range.

B. Sliding Panel Bottom Rollers: Stainless steel, adjustable from interior.

C. Limit Stops: Resilient rubber.

D. Anchors: Hot-dipped galvanized or stainless steel.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that openings are ready to receive work and opening dimensions and clearances are as indicated on shop drawings.

3.02 PREPARATION

A. Prepare opening to permit correct installation of door unit in conjunction with air and vapor seal.

3.03 INSTALLATION

A. Install sliding glass door units in accordance with manufacturer's instructions.

B. Attach frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.

C. Use anchorage devices to securely fasten sliding door assembly to wall construction without distortion or imposed stresses.

D. Install perimeter trim.

3.04 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 from 10 feet straight edge.

3.05 ADJUSTING

A. Adjust hardware for smooth operation.

3.06 CLEANING

A. Remove protective material from factory finished surfaces.

B. Remove labels and visible markings.

C. Wash surfaces by method recommended and acceptable to sealant and sliding glass door manufacturer; rinse and wipe surfaces clean.

D. Upon completion of installation, thoroughly clean door aluminum surfaces in accordance with AAMA 609 & 610.

3.07 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION 08 32 00

SECTION 08 33 23
OVERHEAD COILING DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Exterior coiling doors.

B. Interior non-fire-rated coiling doors.

C. Electric operators and control stations.

D. Overhead coiling doors and shutters, operating hardware, non-fire-rated and exterior; electrically operated.

E. Wiring from electric circuit disconnect to operators and control stations.

1.02 RELATED REQUIREMENTS

A. Section 07 92 00 - Joint Sealants: Sealing joints between frames and adjacent construction.

B. Section 08 71 00 - Door Hardware: Cylinder cores and keys.

C. Section 09 91 23 - Interior Painting: Field paint finish.

D. Section 26 05 33.13 - Conduit for Electrical Systems: Conduit from electric circuit to operator and from operator to control station.

E. Section 26 05 33.13 - Conduit for Electrical Systems: Conduit from fire alarm system.

F. Section 26 05 83 - Wiring Connections: Power to disconnect.

G. Section 28 46 00 - Fire Detection and Alarm: Fire alarm interconnection.

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. ITS (DIR) - Directory of Listed Products; Current Edition.

D. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.

E. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2008 (Reaffirmed 2020).

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 30 00 - Administrative Requirements, for submittal procedures.

1.05 QUALITY ASSURANCE

A. 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 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide five year manufacturer limited warranty for three-ply multifilament polyester fabric curtain.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Overhead Coiling Doors:

1. Amarr; Amarr 4000 Rolling Slat Door: www.amarr.com/commercial/#sle.

2. Raynor Garage Doors; DuraCoil, Model ___: www.raynor.com/#sle.
3. The Cookson Company; ____: www.cooksondoor.com/#sle.

2.02 COILING DOORS

A. Exterior Coiling Doors: Steel slat curtain.
1. Capable of withstanding positive and negative 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 8.1.
3. Nominal Slat Size: 2 inches wide by required length.
4. Finish: Factory painted, color as selected.
5. Guides, Formed Sheet Metal: Galvanized steel.
6. Hood Enclosure: Manufacturer's standard; color to match slats.
7. Electric operation.
8. Mounting: Within framed opening.
9. Locking Devices: Slide bolt on inside.

B. Interior Non-Fire-Rated Coiling Doors Type ___: Steel slat curtain.
1. Single Thickness Slats: Manufacturer's standard.
2. Nominal Slat Size: 2 inches wide by required length.
3. Finish: Factory painted, color as selected.
4. Guides, Angles: Primed steel.
5. Hood Enclosure: Manufacturer's standard; primed steel.
6. Electric operation.
7. Mounting: Surface mounted.

2.03 MATERIALS AND COMPONENTS

A. Metal Curtain Construction: Interlocking slats.
1. Curtain Bottom for Slat Curtains: Fitted with angles to provide reinforcement and positive contact in closed position.
2. Weatherstripping for Exterior Doors: Moisture and rot proof, resilient type, located at jamb edges, bottom of curtain, and where curtain enters hood enclosure of exterior doors.
3. Steel Slats: Minimum thickness, ___ gauge, ___ inch; ASTM A653/A653M galvanized steel sheet.

B. Guide Construction: Continuous, of profile to retain door in place with snap-on trim, mounting brackets of same metal.

C. Guides - Angle: ASTM A36/A36M metal angles, size as indicated.
1. Prime painted.

D. Guides - Sheet Metal: Formed from sheet metal, ___ gauge, ___ inch thick; ___ inch wide.
1. Hot-Dip Galvanizing: Minimum G90 coating, in compliance with ASTM A653/A653M.

E. Hood Enclosure and Trim: Internally reinforced to maintain rigidity and shape.

F. Lock Hardware:
1. For motor operated units, additional lock or latching mechanisms are not required.
2. Slide Bolt: Provide on single-jamb side, extending into slot in guides, with padlock on one side.

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 interlock switches on motor operated units.

B. Electric Operators:
1. Mounting: Side mounted.
2. Motor Enclosure:

3. Motor Rating: 1/3 HP; continuous duty.
4. Motor Voltage: 120 volts, single phase, 60 Hz.
5. Motor Controller: NEMA ICS 2, full voltage, reversing magnetic motor starter.
6. Controller Enclosure: NEMA EN 10250, Type 4.
7. Opening Speed: 12 inches per second.
8. Brake: Manufacturer's standard type, activated by motor controller.
9. Manual override in case of power failure.
10. See Section 26 05 83 for electrical connections.

C. Control Station: Provide standard three button, 'Open-Close-Stop' momentary-contact control device for each operator complying with UL 325.
1. 24 volt circuit.
2. Surface mounted, at interior door jamb.
3. Entrapment Protection Devices: Provide sensing devices and safety mechanisms complying with UL 325.
a. Primary Device: Provide electric sensing edge, wireless sensing, NEMA 1 photo eye sensors, or NEMA 4X photo eye sensors as required with momentary-contact control device.

D. Safety Edge: Located at bottom of coiling door, full width, electro-mechanical sensitized type, wired to stop and reverse door direction upon striking object, hollow neoprene covered.

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.

E. Coordinate installation of electrical service with Section 26 05 83.

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 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 08 33 23

SECTION 08 36 13
SECTIONAL DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Overhead sectional doors, electrically operated.

B. Operating hardware and supports.

C. Electrical controls.

1.02 RELATED REQUIREMENTS

A. Section 05 50 00 - Metal Fabrications: Steel channel opening frame.

B. Section 06 10 00 - Rough Carpentry: Rough wood framing for door opening.

C. Section 07 92 00 - Joint Sealants: Sealing joints between frames and adjacent construction.

D. Section 09 91 23 - Interior Painting: Finish painting.

E. Section 26 05 33.13 - Conduit for Electrical Systems: Conduit from electric circuit to operator and from operator to control station.

F. Section 26 05 83 - Wiring Connections.

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 (Reaffirmed 2020).

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025.

D. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

E. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

F. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

G. ASTM C1036 - Standard Specification for Flat Glass; 2021.

H. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2024.

I. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2008 (Reaffirmed 2020).

J. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.

K. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

L. 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 30 00 - Administrative Requirements for submittal procedures.

B. Shop Drawings: Indicate opening dimensions and required tolerances, connection details, anchorage spacing, hardware locations, and installation details.

C. Product Data: Show component construction, anchorage method, and hardware.

D. Samples: Two panel finish samples, ___ by ___ inch in size, illustrating color and finish.

E. Manufacturer's Installation Instructions: Include any special procedures required by project conditions.

F. Manufacturer's qualification statement.

G. Installer's qualification statement.

H. Operation Data: Include normal operation, troubleshooting, and adjusting.

I. Maintenance Data: Include data for motor and transmission, shaft and gearing, lubrication frequency, spare part sources.

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.

1.06 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for warranty requirements.

B. Extended Correction Period: Correct defective work within a 2-year period commencing on Date of Substantial Completion.

C. Manufacturer Warranty: Provide 5-year manufacturer warranty for electric operating equipment. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Sectional Doors:
   1. Raynor Garage Doors; AlumaView, Model AV175: www.raynor.com/#sle.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 COMPONENTS

A. Track: Rolled galvanized steel, 0.090 inch minimum thickness; 2 inch wide, continuous one piece per side; galvanized steel mounting brackets 1/4 inch thick.

B. Track: Galvanized steel angles, 0.094 inch minimum thickness; 2-5/16 x 4 inch size, continuous one piece per side; galvanized steel mounting brackets 1/4 inch thick.

C. Hinge and Roller Assemblies: Heavy duty hinges and adjustable roller holders of galvanized steel; floating hardened steel bearing rollers, located at top and bottom of each panel, each side.

D. Lift Mechanism: Torsion spring on cross head shaft, with braided galvanized steel lifting cables.

E. Sill Weatherstripping: Resilient hollow rubber strip, one piece; fitted to bottom of door panel, full length contact.

F. Jamb Weatherstripping: Roll formed steel section full height of jamb, fitted with resilient weatherstripping, placed in moderate contact with door panels.

G. Head Weatherstripping: EPDM rubber seal, one piece full length.

H. Panel Joint Weatherstripping: Neoprene foam seal, one piece full length.

I. Lock: Inside center mounted, adjustable keeper, spring activated latch bar with feature to retain in locked or retracted position; interior and exterior handle.

2.03 MATERIALS

A. Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G60/Z180 coating, plain surface.

B. Aluminum Sheet: ASTM B209/B209M, 5005 alloy, H14 temper, plain surface.

C. Aluminum Extrusions: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.

D. Laminated Safety Glass: ASTM C1172 with at least 0.030 inch thick polyvinyl butyral (PVB) interlayer, and in compliance with safety criteria 16 CFR 1201 Categories 1 and 2, and ANSI Z97.1.

2.04 ELECTRIC OPERATION

A. Electric Operators:
   1. Mounting: Side mounted on cross head shaft.
   2. Motor Enclosure:
   3. Motor Rating: 1/3 hp; continuous duty.
   4. Motor Voltage: 120 volts, single phase, 60 Hz.
   5. Motor Controller: NEMA ICS 2, full voltage, reversing magnetic motor starter.
   6. Controller Enclosure: NEMA EN 10250, Type 1.
   7. Opening Speed: 12 inches per second.
   8. Brake: Adjustable friction clutch type, activated by motor controller.
   9. Manual override in case of power failure.
   10. See Section 26 05 83 for electrical connections.

B. 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.

C. Control Station: Provide standard three button (Open-Close-Stop) momentary-contact control device for each operator complying with UL 325.
   1. 24 volt circuit.
   2. Surface mounted, at interior door jamb.
   3. Entrapment Protection Devices: Provide sensing devices and safety mechanisms complying with UL 325.
      a. Primary Device: Provide electric sensing edge, wireless sensing, NEMA 1 photo eye sensors, or NEMA 4X photo eye sensors as required with momentary-contact control device.

D. Safety Edge: Located at bottom of sectional door panel, full width; electro-mechanical sensitized type, wired to stop and reverse door direction upon striking object; hollow neoprene covered to provide weatherstrip seal.

E. Provide interconnection to security system.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that wall openings are ready to receive work and opening dimensions and tolerances are within specified limits.

B. Verify that electric power is available and of the correct characteristics.

3.02 PREPARATION

A. Prepare opening to permit correct installation of door unit to perimeter air and vapor barrier seal.

B. Apply primer to wood frame.

3.03 INSTALLATION

A. Install door unit assembly in accordance with manufacturer's instructions.

B. Anchor assembly to wall construction and building framing without distortion or stress.

C. Securely brace door tracks suspended from structure. Secure tracks to structural members only.

D. Fit and align door assembly including hardware.

E. Coordinate installation of electrical service. Complete power and control wiring from disconnect to unit components.

F. Install perimeter trim.

3.04 TOLERANCES

A. Maximum Variation from Plumb: 1/16 inch.

B. Maximum Variation from Level: 1/16 inch.

C. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch from 10 ft straight edge.

D. Maintain dimensional tolerances and alignment with adjacent work.

3.05 ADJUSTING

A. Adjust door assembly for smooth operation and full contact with weatherstripping.

B. Have manufacturer's field representative present to confirm proper operation and identify adjustments to door assembly for specified operation.

3.06 CLEANING

A. Clean doors and frames and glazing.

B. Remove temporary labels and visible markings.

3.07 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

B. Do not permit construction traffic through overhead door openings after adjustment and cleaning.

END OF SECTION 08 36 13

SECTION 08 41 26
ALL-GLASS ENTRANCES AND STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. All-glass entrances.

B. All-glass storefronts.

1.02 RELATED REQUIREMENTS

A. Section 09 21 16 - Gypsum Board Assemblies.

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 C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).

D. ASTM C1036 - Standard Specification for Flat Glass; 2025.

E. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2025.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's descriptive literature for each component in all-glass entrance assembly.

C. Shop Drawings: Drawings showing layout, dimensions, identification of components, and interface with adjacent construction.
   1. Include field measurements of openings.
   2. Include elevations showing:
      a. Appearance of all-glass entrance layouts.
      b. Locations and identification of manufacturer-supplied door hardware and fittings.
      c. Locations and sizes of cut-outs and drilled holes for other door hardware.
   3. Include details of:
      a. Requirements for support and bracing at openings.
      b. Installation details.
      c. Appearance of manufacturer-supplied door hardware and fittings.
   4. Schedule: Listing of each type component in all-glass entrance assemblies, cross-referenced to shop drawing plans, elevations, and details.

D. Selection Samples: Two sets, representing manufacturer's full range of available metal materials and finishes.

E. Verification Samples: Two samples, minimum size 2 by 3 inches, representing actual material and finish of exposed metal.

F. Design Data: Design calculations, bearing seal and signature of structural engineer licensed to practice in the State in which the Project is located, documenting compliance of exterior assemblies with wind pressure criteria.

1.05 QUALITY ASSURANCE

A. Designer Qualifications: Design under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. All-Glass Entrances and Storefronts:
   1. Avanti Systems USA: www.avantisystemsusa.com/#sle.
   2. Trulite Glass & Aluminum Solutions, LLC: www.trulite.com/#sle.
   3. Substitutions: See Section 01 60 00 - Product Requirements.

B. Fittings and Hardware:
   1. Avanti Systems USA: www.avantisystemsusa.com/#sle.
   2. DORMA USA, Inc: www.dorma.com/#sle.

2.02 ALL-GLASS ENTRANCES AND STOREFRONTS ASSEMBLIES

A. Entrances and Storefronts: Factory fabricated assemblies consisting of frameless glass panels fastened with metal structural fittings in configuration indicated on drawings.
   1. Operational Loads: Designed to withstand door operation under normal traffic without damage, racking, sagging, or deflection.
   2. Prepared for all specified hardware whether specified in this section or not.
   3. Finished metal surfaces protected with strippable film.
   4. Factory assembled to greatest extent practicable; may be disassembled to accommodate shipping constraints.

2.03 ALL-GLASS ENTRANCES AND STOREFRONTS

A. Manufacturers:
   1. Avanti Systems USA, Inc: www.avantisystemsusa.com/#sle.
   2. DORMA USA, Inc: www.dorma.com/#sle.
   3. Trulite Glass & Aluminum Solutions, LLC: www.trulite.com/#sle
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 FITTINGS AND HARDWARE

A. Rail Style Fittings for Swinging Doors and Related Fixed Glazing:
   1. Top Rails: 3-15/16 inch high with matching end caps.
   2. Bottom Rails: 3-15/16 inch high with matching end caps.
   3. Sidelite Rails: Match door rail sightlines.

2.05 BASIS OF DESIGN - FITTINGS AND HARDWARE

A. Rail Style Fittings for Swinging Doors and Related Fixed Glazing:

B. Glazing Accessories for Related Fixed Glazing:
   1. Basis of Design: DORMA USA, Inc; Dri-Fit Glazing System: www.dorma.com/#sle.

2.06 MATERIALS

A. Glass: Flat glass meeting requirements of ASTM C1036, Type I - Transparent Flat Glass, Quality Q3, and Kind FT, fully tempered, in accordance with ASTM C1048, and as follows:
   1. Thickness: 3/8 inch.
   2. Color: Class 1, Clear.
   3. Prepare glazing panels for indicated fittings and hardware before tempering.
   4. Polish edges that will be exposed in finished work to bright flat polish.
   5. Temper glass materials horizontally; visible tong marks or tong mark distortions are not permitted.

B. Aluminum Components: Comply with ASTM B221 (ASTM B221M), Alloy 6063, Temper T5.

C. Sealant: One-part silicone sealant, comply with ASTM C920, clear.

2.07 ACCESSORIES

A. Exposed Fittings and Hardware: Extruded aluminum, clear anodized finish.

B. Fixed Glazed Panel Fittings: Sufficient to structurally support glazing and doors under specified loads; including but not limited to glazing mullions, clamp fittings, and panel corner patches.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that openings are acceptable.

B. Do not begin installation until substrates and openings have been properly prepared.

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean substrates thoroughly prior to installation.

B. Prepare substrates using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Installation of metal framing for openings as specified in Section 09 21 16.

B. Install in accordance with manufacturer's installation instructions.

C. Tolerances:

1. Horizontal Components and Sight Lines: Not more than 1/8 inch in 10 feet variation from level, non-cumulative.
2. Vertical Components and Sight Lines: Not more than 1/8 inch in 10 feet variation from plumb, non-cumulative.
3. Variation from Plane or Indicated Location: Not more than 1/16 inch.

3.04 CLEANING

A. Clean installed work to like-new condition.

3.05 PROTECTION

A. Protect installed products until Date of Substantial Completion.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION 08 41 26

SECTION 08 43 13
ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed storefront, with vision glass.

B. Infill panels of glass.

C. Aluminum doors and frames.

D. Perimeter sealant.

1.02 RELATED REQUIREMENTS

A. Section 05 12 00 - Structural Steel Framing: Steel attachment members.

B. Section 05 50 00 - Metal Fabrications: Steel attachment devices.

C. Section 07 25 00 - Weather Barriers: Sealing framing to water-resistive barrier installed on adjacent construction.

D. Section 07 92 00 - Joint Sealants: Sealing joints between frames and adjacent construction.

E. Section 08 44 13 - Glazed Aluminum Curtain Walls.

F. Section 08 71 00 - Door Hardware: Hardware items other than specified in this section.

G. Section 08 80 00 - Glazing: Glass and glazing accessories.

H. Section 12 24 00 - Window Shades: Attachments to framing members.

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; 2025.

C. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum; 2025.

D. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.

E. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.

F. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

G. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

H. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

I. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.

J. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

K. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

L. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.

M. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

N. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

O. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.

P. 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).

Q. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).

R. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).

S. 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 (Reapproved 2023).

T. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

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 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and 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.

D. Samples: Submit two samples 2 by 6 inches in size illustrating finished aluminum surface, glass, glazing materials.

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, engineering calculations, and dimensional limitations.

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. Manufacturer's Qualification Statement.

J. Installer's Qualification Statement.

K. 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 the State in which the Project is located.

B. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

C. Installer Qualifications: Company specializing in performing work of type specified and with at least three 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 78 00 - Closeout Submittals for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide five 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 five 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

A. Front-Set Style, Thermally-Broken:
   1. Basis of Design: EFCO Corporation; Series 433, Thermal Triple-Set Storefront Framing: www.efcocorp.com/#sle.
   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. C.R. Laurence Company, Inc; U.S. Aluminum: www.crl-arch.com/#sle.
   2. Kawneer, an Alcoa Company; www.kawneer.com.
   3. Old Castle BE (Vistawall); www.oldcastlebe.com.
   4. Tubelite, Inc.; www.tubeliteinc.com.

C. Substitutions: See Section 01 60 00 - Product Requirements.
   1. For any product not identified as "Basis of Design", submit information as specified for substitutions.

2.02 BASIS OF DESIGN -- SWINGING DOORS

A. Medium Stile, Insulating Glazing, Thermally-Broken:
   1. Basis of Design: EFCO Corporation; Series D302 Thermastile: www.efcocorp.com/$sle.
   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. C.R. Laurence Company, Inc; U.S. Aluminum; _____: www.crl-arch.com/#sle.
   2. Kawneer, an Alcoa Company; www.kawneer.com.
   3. Old Castle BE (Vistawall); www.oldcastlebe.com.
   4. Tubelite, Inc.; www.tubeliteinc.com.

C. Substitutions: See Section 01 60 00 - Product Requirements.
   1. For any product not identified as "Basis of Design", submit information as specified for substitutions.

2.03 ALUMINUM-FRAMED STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.

1. Glazing Rabbet: For 1 inch insulating glazing.
2. Glazing Rabbet: For 1/4 inch monolithic glazing where indicated on drawings.
3. Glazing Position: Center Set for Custom Color and Outside Set for Clear Anodized..
4. Finish: Class I natural anodized.
   a. Factory finish all surfaces that will be exposed in completed assemblies.
5. Finish Color: At locations indicated on drawings: Clear Anodized _____.
6. Finish Color: At locations indicated on drawings: Custom Color to Match Accent Color Metal Panel (Basis of Design: Citadel Patina Green)
7. Finish Color: At locations indicated on drawings: Black Anodized.
8. 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.
9. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
10. 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.
11. 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.
12. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
13. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
14. Maintain continuous air barrier and/or vapor retarder seal throughout assembly, primarily in line with inside pane of glazing and inner sheet of infill panel, and heel bead of glazing compound.

B. Performance Requirements
   1. 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 flexure limit of glass in any direction, with full recovery of glazing materials.
   2. Air Leakage: 0.06 cfm/sq ft maximum leakage of storefront wall area when tested in accordance with ASTM E283/E283M at 1.57 psf pressure difference.
   3. System Assembly: Accommodate without damage to components or deterioration of seals, movement within system, movement between system and peripheral construction, dynamic loading and release of loads, deflection of structural support framing.
   4. Movement: Accomodate movement between storefront and perimeter framing and deflection lintel, without damage to components or deterioration of seals.
   5. Vapor Seal: Limit vapor seal with interior atmospheric pressure of 1 inch (25 mm) sp, 72 degrees F (22 degrees C), 40 Percent RH without seal failure.
   6. 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.
   7. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line iwht inside pane of glass and inner sheet of infill panel and heel bead of glazing compound.
   8. 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.

2.04 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, drainage holes and internal weep drainage system.
   1. Glazing Stops: Flush.

B. Glazing: See Section 08 80 00.

C. Applied Muntins: Prefabricated simulated divided lite grid assembly with perimeter surround; designed to be adhered and fastened to storefront framing members and glazing.
   1. Material: Extruded aluminum.
   2. Profile: Manufacturer's standard, as detailed on drawings.
   3. Finish: Same as storefront.

D. Swing Doors: Glazed aluminum.
   1. Top Rail: 4 inches wide.
   2. Vertical Stiles: 4-1/2 inches wide.
   3. Bottom Rail: 10 inches wide.
   4. Finish: Same as storefront unless indicated otherwise on drawings.

2.05 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Sheet Aluminum: ASTM B209/B209M.

C. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.

D. Structural Supporting Anchors Attached to Structural Steel: Design for bolted attachment.

E. Fasteners: Stainless steel.

F. Sill Flashing Sealant: Elastomeric, silicone or polyurethane, compatible with flashing material.

G. Sealant for Setting Thresholds: Non-curing butyl type.

H. Perimeter Sealant: Type as specified in Section 07 92 00.

I. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

J. Glazing Accessories: See Section 08 80 00.

K. Shop and Touch-Up Primer for Steel Components: Zinc oxide, alkyd, linseed oil primer appropriate for use over hand cleaned steel.

L. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

2.06 FINISHES

A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.

B. Color: As selected by Architect from manufacturer's custom range.

C. Touch-Up Materials: As recommended by coating manufacturer for field application.

2.07 HARDWARE

A. Other Door Hardware: See Section 08 71 00.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other work.

B. Verify that storefront wall openings and adjoining water-resistive and/or air barrier 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. 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. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.

H. Coordinate attachment and seal of perimeter air and vapor barrier material.

I. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

J. Set thresholds in bed of sealant and secure.

K. Install glass and infill panels using glazing method required to achieve performance criteria; see Section 08 80 00.

L. Install applied muntin grid assembly in accordance with manufacturer's instructions.

M. Install perimeter sealant in accordance with Section 07 92 00.

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 ADJUSTING

A. Adjust operating hardware and sash for smooth operation.

3.05 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.

C. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.

D. Remove excess sealant by method acceptable to sealant manufacturer.

3.06 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION 08 43 13

SECTION 08 44 13
GLAZED ALUMINUM CURTAIN WALLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed curtain wall, with vision glazing and glass and metal infill panels.

B. Aluminum-framed sloped curtain wall, self-supporting, with vision glazing.

C. Perimeter sealant.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Weld plates embedded in concrete for attachment of anchors.

B. Section 05 12 00 - Structural Steel Framing: Steel attachment members.

C. Section 05 50 00 - Metal Fabrications: Steel attachment devices.

D. Section 07 25 00 - Weather Barriers: Sealing framing to water-resistive barrier installed on adjacent construction.

E. Section 07 90 05 - Joint Sealers: Perimeter sealant and back-up materials.

F. Section 08 42 29 - Automatic Entrances.

G. Section 08 43 13 - Aluminum-Framed Storefronts: Entrance framing and doors.

H. Section 08 80 00 - Glazing.

I. Section 09 21 16 - Gypsum Board Assemblies: Metal stud and gypsum board wall at interior of curtain wall.

J. Section 12 24 00 - Window Shades: Attachments to framing members.

1.03 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2015.

B. AAMA 501.1 - Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure; 2017.

C. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems; 2025.

D. AAMA 501.4 - Recommended Static Test Method for Evaluating Window Wall, Curtain Wall and Storefront Systems Subjected to Seismic and Wind-Induced Inter-Story Drift; 2018.

E. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum; 2025.

F. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.

G. AAMA 612 - Voluntary Specification, Performance Requirements, and Test Procedures for Combined Coatings of Anodic Oxide and Transparent Organic Coatings on Architectural Aluminum; 2020, with Errata (2022).

H. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.

I. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

J. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

K. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

L. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

M. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

N. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.

O. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

P. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

Q. ASTM C794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants; 2018 (Reapproved 2022).

R. ASTM C1184 - Standard Specification for Structural Silicone Sealants; 2023.

S. 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).

T. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).

U. ASTM E547 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference; 2000 (Reapproved 2024).

V. 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 (Reapproved 2023).

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. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, internal drainage details, glazing, and infill.

B. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.

C. Samples: Submit two samples 4 by 4 inches in size illustrating finished aluminum surface, glazing, and glazing materials.

D. 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.

E. 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.

F. Structural Glazing Adhesive: Submit product data and calculations showing compliance with performance requirements.

G. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.

H. Designer's Qualification Statement.

I. Manufacturer's Qualification Statement.

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 the State in which the Project is located.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than three years of documented experience.

1.07 MOCK-UPS

A. Provide 4 by 4 feet mock-up including each component being used on the project. Assemble to illustrate component assembly including glazing materials, weep drainage system, attachments, anchors, and perimeter sealant.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.09 FIELD CONDITIONS

1.10 WARRANTY

A. Correct defective Work within a five year period after Date of Substantial Completion.

B. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

C. Provide five 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 - CURTAIN WALL SYSTEMS

A. Pressure Cap Four Sides; Not Unitized, Field Assembled:
   1. Basis of Design: EFCO, a Pella Company; System 5600, 2-1/2 inch wide face www.efcocorp.com/#sle.

B. Other Manufacturers: Provide either product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed below.
   1. C.R. Laurence Company, Inc; U.S. Aluminum: www.crl-arch.com/#sle.
   2. Kawneer, an Alcoa Company; www.kawneer.com
   3. Old Castle BE (Vistawall); www.oldcastlebe.com
   4. Tubelite, Inc.; www.tubeliteinc.com

C. Substitutions: See Section 01 60 00 - Product Requirements.
   1. For any product not identified as "Basis of Design", submit information as specified for substitutions.

2.02 CURTAIN WALL

1. Outside glazed, with pressure plate and mullion cover.
2. Fabrication Method: Either shop/factory or field fabricated system.
3. Glazing Method: Field glazed system.
4. Vertical Mullion Depth From Face to Back: 6-1/2 inches.
   a. Factory finish surfaces that will be exposed in completed assemblies.
   b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
   c. 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. Maintain continuous air barrier and/or vapor retarder seal throughout assembly, primarily in line with inside pane of glazing and inner sheet of infill panel and heel bead of glazing compound.
9. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
    a. 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.
    b. 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.
10. Seismic Loads: Design and size components to withstand seismic loads and sway displacement in accordance with requirements of ASCE 7.
11. 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.
12. Test Pressure Differential: 10 psf.

B. Air Leakage: 0.06 cfm/sq ft maximum leakage of wall area when tested in accordance with ASTM E283/E283M at 6.27 psf pressure difference across assembly.

C. Thermal Performance Requirements:
    1. Condensation Resistance Factor of Framing: 50, minimum, measured in accordance with AAMA 1503.

2.03 COMPONENTS

1. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.
2. Horizontal mullion cap extensions. Depth as indicated on Drawings.

B. Glazing: See Section 08 80 00.

2.04 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Sheet Aluminum: ASTM B209/B209M.

C. Structural Supporting Anchors Attached to Structural Steel: Design for bolted attachment.

D. Structural Supporting Anchors Attached to Reinforced Concrete Members: Design for welded attachment to weld plates embedded in concrete.

E. Fasteners: Stainless steel; type as required or recommended by curtain wall manufacturer.

F. Exposed Flashings: 0.032 inch thick aluminum sheet; finish to match framing members.

G. Concealed Flashings: 0.018 inch thick galvanized steel.

H. Structural Glazing Adhesive: Silicone, neutral cure; formulated specifically for structural sealant glazing and complying with ASTM C1184.
    1. Ultraviolet radiation resistant for 2000 to 4000 micro-watts minimum for 21 days.
    2. Adhesion when subjected to ultraviolet radiation through glass in accordance with ASTM C794 without failure.

3. Minimum adhesion tensile strength of 100 psi.
4. Tested for compatibility with glazing accessories and weatherseal sealant.

I. Weatherseal Sealant: Silicone, with adhesion in compliance with ASTM C794; compatible with glazing accessories.

J. Sill Flashing Sealant: Elastomeric, silicone or polyurethane, and compatible with flashing material.

K. Perimeter Sealant: Type as specified in Section 07 90 05.

L. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

M. Glazing Accessories: See Section 08 80 00.

2.05 FINISHES

A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.

B. Color: To be selected by Architect from manufacturer's full range.

C. Touch-Up Materials: As recommended by coating manufacturer for field application.

PART 3 EXECUTION

3.01 EXAMINATION

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. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

D. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

E. Coordinate attachment and seal of perimeter air and vapor barrier materials.

F. Provide low pressure foamed-in-place insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

G. Pressure Plate Framing: Install glazing and infill panels using exterior dry glazing method; see Section 08 80 00.

H. Install perimeter sealant in accordance with Section 07 90 05.

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.

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. 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.

C. Repair or replace curtain wall components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.05 ADJUSTING

3.06 CLEANING

A. 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.

B. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.

C. Remove excess sealant by method acceptable to sealant manufacturer.

3.07 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION 08 44 13

SECTION 08 71 00
DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hardware for wood, aluminum, and hollow metal doors.

B. Hardware for fire-rated doors.

C. Electrically operated and controlled hardware.

D. Lock cylinders for doors that hardware is specified in other sections.

E. Thresholds.

F. Weatherstripping and gasketing.

1.02 RELATED REQUIREMENTS

A. Section 07 92 00 - Joint Sealants: Sealants for setting exterior door thresholds.

B. Section 08 11 13 - Hollow Metal Doors and Frames.

C. Section 08 14 16 - Flush Wood Doors.

D. Section 08 43 13 - Aluminum-Framed Storefronts: Door hardware, except as noted in section.

E. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1.03 REFERENCE STANDARDS

A. ANSI A117.1 - Accessible and Usable Buildings and Facilities.

B. ICC/IBC - International Building Code.

C. NFPA 70 - National Electrical Code.

D. NFPA 80 - Fire Doors and Windows.

E. NFPA 101 - Life Safety Code.

F. NFPA 105 - Installation of Smoke Door Assemblies.

G. State Building Codes, Local Amendments.

H. Standards: All hardware specified herein shall comply with the following industry standards:
   1. ANSI/BHMA Certified Product Standards - A156 Series
   2. UL10C - Positive Pressure Fire Tests of Door Assemblies

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.

B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

C. Preinstallation Meeting: Convene a preinstallation meeting one week prior to commencing work of this section; attendance is required by affected installers and the following:
   1. Architect.
   2. Installer's Architectural Hardware Consultant (AHC).
   3. Hardware Installer.
   4. Owner's Security Consultant.

D. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.

1.05 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
   1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
   2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
   3. Content: Include the following information:
      a. Type, style, function, size, label, hand, and finish of each door hardware item.
      b. Manufacturer of each item.
      c. Fastenings and other pertinent information.
      d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
      e. Explanation of abbreviations, symbols, and codes contained in schedule.
      f. Mounting locations for door hardware.
      g. Door and frame sizes and materials.
      h. Warranty information for each product.
   4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Shop Drawings: Details of electrified access control hardware indicating the following:
   1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:
      a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
      b. Complete (risers, point-to-point) access control system block wiring diagrams.
      c. Wiring instructions for each electronic component scheduled herein.
   2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

E. Informational Submittals:
   1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals.

1.06 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

D. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
   1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
   2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

F. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
   1. Function of building, purpose of each area and degree of security required.
   2. Plans for existing and future key system expansion.
   3. Requirements for key control storage and software.
   4. Installation of permanent keys, cylinder cores and software.
   5. Address and requirements for delivery of keys.

G. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
   1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
   2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
   3. Review sequence of operation narratives for each unique access controlled opening.
   4. Review and finalize construction schedule and verify availability of materials.
   5. Review the required inspecting, testing, commissioning, and demonstration procedures

H. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.08 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.

C. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.09 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
   1. Structural failures including excessive deflection, cracking, or breakage.
   2. Faulty operation of the hardware.
   3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
   4. Electrical component defects and failures within the systems operation.

C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:
   1. Ten years for mortise locks and latches.
   2. Five years for exit hardware.
   3. Twenty five years for manual surface door closer bodies.
   4. Two years for electromechanical door hardware.

1.10 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 PRODUCTS

2.01 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
   1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.02 HANGING DEVICES

A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
   1. Quantity: Provide the following hinge quantity:
      a. Two Hinges: For doors with heights up to 60 inches.
      b. Three Hinges: For doors with heights 61 to 90 inches.
      c. Four Hinges: For doors with heights 91 to 120 inches.
      d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
   2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
      a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
      b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.
   3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
      a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
      b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
   4. Hinge Options: Comply with the following:
      a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
   5. Manufacturers:
      a. Hager Companies (HA) - CB Series.
      b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - TA Series.
      c. Stanley Hardware (ST) - CB Series.

B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge. with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.
   1. Manufacturers:
      a. Ives (IV).
      b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK).
      c. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).

2.03 POWER TRANSFER DEVICES

A. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug

directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:
    a. Von Duprin (VD) - EPT-10 Series.
    b. Securitron (SU) - EL-CEPT Series

B. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:
    a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - Electrical Connecting Kit: QC-R001.
    b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - Connector Hand Tool: QC-R003.
2. Manufacturers:
    a. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) -QC- C Series.

2.04 DOOR OPERATING TRIM

A. Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified.

1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
2. Furnish dust proof strikes for bottom bolts.
3. Surface bolts to be minimum 8” in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
5. Manufacturers:
    a. Ives (IV).
    b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
    c. Trimco (TC).

B. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
5. Manufacturers:
    a. Ives (IV).
    b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
    c. Trimco (TC).

2.05 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.
   1. Manufacturers:
      a. Dormakaba Best (BE).
      b. No Substitution.

C. Cylinders: Original manufacturer cylinders complying with the following:
   1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
   2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
   3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
   4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
   5. Keyway: Match Facility Standard.

D. Keying System: Each type of lock and cylinders to be factory keyed.
   1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.
   2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
   3. Existing System: Key locks to Owner's existing system.

E. Key Quantity: Provide the following minimum number of keys:
   1. Change Keys per Cylinder: Two (2)
   2. Master Keys (per Master Key Level/Group): Five (5).
   3. Construction Keys (where required): Ten (10).

F. Construction Keying: Provide construction master keyed cylinders.

G. Key Registration List (Bitting List):
   1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
   2. Provide transcript list in writing or electronic file as directed by the Owner.

2.06 MECHANICAL LOCKS AND LATCHING DEVICES

A. A. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Operational Grade 1 Certified Products Directory (CPD) listed
   1. Furnish with solid cast levers, standard 2 3/4” backset, and 1/2" (3/4" at rated paired openings) throw brass or stainless steel latchbolt.
   2. Locks are to be non-handed and fully field reversible.
   3. Manufacturers:
      a. Dormakaba Best (BE)
      b. No Substitution.

B. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Grade 1 certified.
   1. Furnish with solid cast levers, standard 2 3/4” backset, and 1/2" (3/4" at rated paired openings) throw brass or stainless steel latchbolt.
   2. Locks are to be non-handed and fully field reversible.
   3. Extended cycle test: Locks to have been cycle tested in ordinance with ANSI/BHMA 156.2 requirements to 2 million cycles.
   4. Manufacturers:
      a. Corbin Russwin Hardware (RU) - CL3300 Series.
      b. Stanley Best (BE) - 9K Series.

2.07 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
   1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
   2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
   3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
   4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:
   1. Strikes for Mortise Locks and Latches: BHMA A156.13.
   2. Strikes for Bored Locks and Latches: BHMA A156.2.
   3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
   4. Dustproof Strikes: BHMA A156.16.

2.08 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
   1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
   2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.
   3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
   4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
   5. Electromechanical Options: Subject to same compliance standards and requirements as mechanical exit devices, electrified devices to be of type and design as specified in hardware sets. Include any specific controllers when conventional power supplies are not sufficient to provide the proper inrush current.
   6. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.
      a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
      b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
   7. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
   8. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.
   9. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
   10. Rail Sizing: Provide exit device rails factory sized for proper door width application.
   11. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.
   1. Manufacturers:
      a. Von Duprin (VD) - 35A/98 XP Series.
      b. No Substitution.

2.09 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:
   1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
   2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
   3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.
   4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.
   5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
   6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
   7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Large Body Cast Iron): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control.
   1. Manufacturers:
      a. Sargent Manufacturing (SA) – 281 Series.
      b. No Substitution.

2.10 SURFACE MOUNTED CLOSER HOLDERS

A. Electromagnetic Door Holders: Certified ANSI A156.15 electromagnetic door holder/releases with a minimum 20 to 40 pounds holding power and single coil construction able to accommodate.12VDC, 24VAC, 24VDC and 120VAC. Coils to be independently wound, employing an integral fuse and armatures to include a positive release button.
   1. Manufacturers:
      a. LCN Door Closers (LC) - SEM7800 Series.
      b. Rixson (RF) - 980/990 Series.
      c. Sargent Manufacturing (SA) - 1560 Series.

2.11 ARCHITECTURAL TRIM

A. Door Protective Trim
   1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
   2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width

and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.

3. Where plates are applied to fire rated doors with the top of the plate more than 16” above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer’s catalog and template book for specific requirements for size and applications.
4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:
    a. Stainless Steel: 300 grade, 050-inch thick.
5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
6. Manufacturers:
    a. Ives (IV).
    b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
    c. Trimco (TC).

2.12 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
    1. Manufacturers:
        a. Ives (IV).
        b. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).
        c. Trimco (TC).

C. Overhead Door Stops and Holders: ANSI/BHMA A156.6, Grade 1 certified overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.
    1. Manufacturers:
        a. Glynn Johnson (GJ).
        b. Rixson Door Controls (RF).
        c. Sargent Manufacturing (SA).

2.13 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
    1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
    1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:
   1. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
   2. Reese Enterprises, Inc. (RE).

2.14 ELECTRONIC ACCESSORIES

A. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.
   1. Manufacturers:
      a. Security Door Controls (SD) - DPS Series.
      b. Securitron (SU) - DPS Series.

B. Power Supplies: Provide Nationally Recognized Testing Laboratory Listed 12VDC or 24VDC (field selectable) filtered and regulated power supplies. Include battery backup option with integral battery charging capability in addition to operating the DC load in event of line voltage failure. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.
   1. Manufacturers:
      a. Sargent Manufacturing (SA) – 3280 Series.
      b. Von Duprin (VD) - PS.

2.15 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.16 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.02 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.03 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
   1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
   1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
   2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
   3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
   4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.04 FIELD QUALITY CONTROL

A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.05 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.

3.06 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.07 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.08 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should 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 and functionality.

B. The supplier is responsible for handing and sizing all products and providing the correct option for the appropriate door type and material where more than one is presented in the hardware sets. Quantities listed are for each pair of doors, or for each single door.

C. Manufacturer's Abbreviations:

END OF SECTION 08 71 00

SECTION 08 80 00
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Insulating glass units.

B. Glazing units.

C. Glazing Infill Panels

D. Plastic films.

E. Glazing compounds.

1.02 RELATED REQUIREMENTS

A. Section 07 92 00 - Joint Sealants: Sealants for other than glazing purposes.

B. Section 08 11 13 - Hollow Metal Doors and Frames: Glazed lites in doors and borrowed lites.

C. Section 08 14 16 - Flush Wood Doors: Glazed lites in doors.

D. Section 08 36 13 - Sectional Doors: Glazed lites in doors.

E. Section 08 43 13 - Aluminum-Framed Storefronts: Glazing provided as part of storefront assembly.

F. Section 08 44 13 - Glazed Aluminum Curtain Walls: Glazing provided as part of wall assembly.

G. Section 10 28 00 - Toilet, Bath, and Laundry Accessories: Mirrors.

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 (Reaffirmed 2020).

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 2015).

E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).

F. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2025.

G. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2025.

H. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass; 2021a.

I. ASTM D882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting; 2018.

J. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.

K. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2024.

L. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2024.

M. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes; 2017.

N. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2019.

O. ASTM F1233 - Standard Test Method for Security Glazing Materials And Systems; 2021.

P. GANA (GM) - GANA Glazing Manual; 2022.

Q. GANA (SM) - GANA Sealant Manual; 2008.

R. GANA (LGRM) - Laminated Glazing Reference Manual; 2009.

S. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

T. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use; 1990 (2016).

U. ITS (DIR) - Directory of Listed Products; Current Edition.

V. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.

W. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2023.

X. UL (DIR) - Online Certifications Directory; Current Edition.

Y. UL 9 - Standard for Fire Tests of Window Assemblies; Current Edition, Including All Revisions.

Z. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

AA. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

BB. UL 263 - Standard for Fire Tests of Building Construction and Materials; 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 30 00 - 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 12 by 12 inch in size of glass units.

E. Certificate: Certify that products of this section meet or exceed specified requirements.

F. 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. 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 the type specified and with at least three years documented experience.

1.07 MOCK-UPS

A. See Section 01 40 00 - 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 78 00 - 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.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Glass Fabricators:
   1. JE Berkowitz, LP: www.jeberkowitz.com.
   2. Trulite Glass & Aluminum Solutions, LLC: www.trulite.com.
   3. Viracon, Inc: www.viracon.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Float Glass Manufacturers:
   1. Cardinal Glass Industries: www.cardinalcorp.com.
   2. Guardian Industries Corp: www.sunguardglass.com.
   3. Pilkington North America Inc: www.pilkington.com/na.
   4. PPG Industries, Inc: www.ppgideascapes.com.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

C. Laminated Glass Manufacturers:
   1. Cardinal Glass Industries: www.cardinalcorp.com.
   2. Goldray Industries, Inc: www.goldrayglass.com/#sle.
   3. Viracon, Architectural Glass segment of Apogee Enterprises, Inc: www.viracon.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

D. Fire-Resistance-Rated Glass: Provide products as required to achieve indicated fire-rating period.
   1. Manufacturers:
   2. SAFTIFIRST, a division of O'Keeffe's Inc; SuperLite II-XL: www.safti.com/#sle.
   3. Technical Glass Products; Pilkington Pyrostop: www.fireglass.com/#sle.
   4. Vetrotech North America; Contraflam: www.vetrotechusa.com/#sle.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

E. Laminate Decorative and Security Film Manufacturers:
   1. Solar Film Basis of Design: 3M™ Sun Control Window Film Prestige Series: www.3m.com.
   2. Security Film Basis of Design: 3M Ultra S800: www.3m.com
   3. Other Manufacturers:
      a. Flexvue Films: www.flexvuefilms.com.
      b. Llumar, an Eastman Chemical Company: www.llumar.com/#sle.
      c. Substitutions: See Section 01 60 00 - Product Requirements.
   4. Provide full attachment system from laminate film manufacturer.

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 ASCE 7.

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.

B. Weather-Resistive Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure water-resistive barrier, vapor retarder, and/or air barrier.
1. In conjunction with weather barrier related materials described in other sections, as follows:
2. To utilize inner pane of multiple pane insulating glass units for continuity of vapor retarder and/or air barrier seal.
3. To maintain a continuous vapor retarder and/or air barrier throughout glazed assembly from glass pane to heel bead of glazing sealant.

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.

2.03 GLASS MATERIALS

A. Float Glass: Provide float glass based glazing unless otherwise indicated.
1. Kind HS - Heat-Strengthened Type: Complies with ASTM C1048.
2. Fully Tempered Safety Glass: Complies with ANSI Z97.1 or 16 CFR 1201 criteria for safety glazing used in hazardous locations.

2.04 INSULATING GLASS UNITS

A. Insulating 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: Black.
5. Edge Seal:
   a. Single-Sealed System: Provide silicone, polysulfide, or polyurethane sealant as seal applied around perimeter.
6. Color: Black.
7. Purge interpane space with dry air, hermetically sealed.

B. Type E-1 - Insulating Glass Units: Vision glass, double glazed.
1. Applications: Exterior glazing unless otherwise indicated.
2. Space between lites filled with air.
3. Outboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
   a. Tint: Clear.
   b. Coating: Guardian SunGuard SNX 70+, on #2 surface.
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), Winter - Center of Glass: 0.24, nominal.
7. Visible Light Transmittance (VLT): 66 percent, nominal.
8. Shading Coefficient: 0.31, nominal.

9. Solar Heat Gain Coefficient (SHGC): 0.28 percent, nominal.
10. Glazing Method: Dry glazing method, tape and gasket spline.

C. Type E-2 - Insulating Glass Units: Spandrel Glass.
1. Applications: Exterior glazing as indicate on Drawings.
2. Space between lites filled with air.
3. Outboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
   a. Tint: Clear.
   b. Coating: Same as on vision units, on #2 surface.
4. Inboard Lite: Fully tempered float glass, 1/4 inch thick.
   a. Tint: Spandrel.
   b. Opacifier: Elastomeric coating, on #3 surface.
   c. Opacifier Pattern: Monolithic.
5. Total Thickness: 1 inch.
6. Thermal Transmittance (U-Value), Winter - Center of Glass: 0.24, nominal.
7. Visible Light Reflectance: 62 percent, nominal.
8. Glazing Method: Dry glazing method, tape and gasket spline.

D. Type E-3 - Insulating Glass Units: Security Film
1. Applications: Exterior glazing unless otherwise indicated.
2. Space between lites filled with air.
3. Outboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
   a. Coating: Self-cleaning type, on #1 surface.
   b. Coating: Guardian SunGuard SNX 70+, on #2 surface.
4. Inboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
   a. Tint: Clear.
   b. Film: 3M Ultra S800, on #4 surface.
5. Total Thickness: 1 inch.
6. Thermal Transmittance (U-Value), Winter - Center of Glass: 0.24, nominal.
7. Visible Light Transmittance (VLT): 66 percent, nominal.
8. Shading Coefficient: 0.31, nominal.
9. Solar Heat Gain Coefficient (SHGC): 0.28 percent, nominal.
10. Glazing Method: Dry glazing method, tape and gasket spline.

E. Type E-4 - Insulating Glass Units: Solar Film
1. Applications: Exterior glazing unless otherwise indicated.
2. Space between lites filled with air.
3. Outboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
   a. Coating: Self-cleaning type, on #1 surface.
   b. Coating: Guardian SunGuard SNX 70+, on #2 surface.
4. Inboard Lite: Fully tempered float glass, 1/4 inch thick, minimum.
   a. Tint: Clear.
   b. Film: 3M™ Sun Control Window Film Prestige Series, on #4 surface.
5. Total Thickness: 1 inch.
6. Thermal Transmittance (U-Value), Winter - Center of Glass: 0.24, nominal.
7. Visible Light Transmittance (VLT): 66 percent, nominal.
8. Shading Coefficient: 0.31, nominal.
9. Solar Heat Gain Coefficient (SHGC): 0.28 percent, nominal.
10. Glazing Method: Dry glazing method, tape and gasket spline.

F. Type MP - Metal Panel Infill Unit
1. Basis of Design: GlazeGuard® 1000 WR Plus as manufactured by Citadel Architectural Products, Inc.
   a. Composition:
      1) Face: .024" prefinished smooth aluminum

2) Stabilizer: 3mm high density polypropylene
3) Core: 11/16" expanded polystyrene (EPS) foam
4) Stabilizer: 3mm high density polypropylene
5) Back: 024" prefinished smooth aluminum
6) Thickness: 1" (nominal)
7) Weight: 0.80 lbs/ft² (textured skins / EPS foam), 0.84 lbs/ft² (textured skins / ISO foam) 1.18 lbs/ft² (textured skins / EPS foam), 1.23 lbs/ft² (textured skins / ISO foam)

b. Tolerance:
1) Thickness: ±1/16"
2) Length / Width: +0, -1/8"
3) Squareness: 1/64" per lineal ft

c. Performance:
1) Surface Burning Characteristics: Panel shall have a Class A rating with a Flame Spread Index less than 25, and a Smoke Developed Index less than 450.
2) Testing shall be in accordance with ASTM E84.

d. Finish:
1) Polyvinylidene Fluoride (PVDF):
2) Type:
(a) Kynar 500® coating using 70% resin.
(b) Finish shall be in conformance with AAMA 2605.
3) Color:
(a) As selected by Architect from manufacturer's full color guide.
4) Composition:
(a) Two-Coat Colors:
(1) 0.2-mil primer coat, 0.8-mil color coat
(b) Three-Coat Colors:
(1) 0.2-mil primer coat, 0.8-mil color coat, 0.7-mil clear coat

2.05 GLAZING UNITS

A. Type I-1 - Monolithic Interior Vision Glazing:
1. Applications: Interior glazing unless otherwise indicated.
2. Glass Type: Fully tempered float glass.
3. Tint: Clear.
4. Thickness: 1/4 inch, nominal.
5. Glazing Method: Dry glazing method, gasket glazing.

B. Type I-2 - Fire-Resistance-Rated Glazing: Type, thickness, and configuration of glazing that contains flame, smoke, and blocks radiant heat, as required to achieve indicated fire-rating period exceeding 30 minutes.
1. Applications:
a. Glazing in fire-rated door assembly.
b. Glazing in fire-rated window assembly.
c. Glazing in sidelites, borrowed lites, and other glazed openings in fire-rated wall assemblies.
d. Other locations as indicated on drawings.
2. Glass Type: Tempered glass outer layers filled with semi-solid fire retardant.
3. Provide products listed by {\rs\#1} or {\rs\#1} and approved by authorities having jurisdiction.
4. Safety Glazing Certification: 16 CFR 1201 Category II.
5. Glazing Method: As required for fire rating.
6. Fire-Rating Period: As scheduled.

7. Markings for Fire-Resistance-Rated Glazing Assemblies: Provide permanent markings on fire-resistance-rated glazing in compliance with {\rs\#1}, local building code, and authorities having jurisdiction.
    a. "W" - meets wall assembly criteria of ASTM E119 or UL 263 fire test standards.
    b. "D" - meets fire door assembly criteria of NFPA 252, UL 10B, or UL 10C fire test standards.
    c. "H" - meets fire door assembly hose stream test of NFPA 252, UL 10B, or UL 10C fire test standards.
    d. "T" - meets temperature rise of not more than 450 degrees F above ambient at end of 30 minutes fire exposure in accordance with NFPA 252, UL 10B, or UL 10C fire test standards.
    e. "XXX" - placeholder that represents fire-rating period, in minutes.
8. Manufacturers:
    a. SAFTIFIRST, a division of O'Keeffe's Inc; SuperLite II-XL 90: www.safti.com.
    b. Technical Glass Products; Pilkington Pyrostop 90: www.fireglass.com.
    c. Vetrotech Saint-Gobain North America; Contraflam 90: www.vetrotechusa.com.
    d. Substitutions: See Section 01 60 00 - Product Requirements.

C. Type I-3 - Monolithic Interior Vision Glazing with Safety and Security Film along with attachment system:
1. Applications: As scheduled.
2. Glass Type: Fully tempered float glass.
3. Tint: ____.
4. Thickness: 1/4 inch, nominal.
5. Glazing Method: Dry glazing method, gasket glazing.
6. Location: Interior storefront located in Attendance
7. Film: 3M Ultra S800

2.06 PLASTIC FILMS

A. Solar Control Plastic Film: 3M™ Sun Control Window Film Prestige Series .
1. Application: Locations as indicated on drawings.
2. Manufacturers:
    a. 3M Window Films: solutions.3m.com/wps/portal/3M/en_US/Window_Film/Solutions/#sle.
    b. Substitutions: See Section 01 60 00 - Product Requirements.

B. Safety and Security Plastic Film: Polyester type. Basis of design: 3M Ultra 800 with attachment system
1. Application: Locations as indicated on drawings.
2. Tensile Strength: Minimum of 32,000 psi when measured in accordance with ASTM D882.
3. Impact Resistance: Comply with ANSI Z97.1 and 16 CFR 1201 impact test requirements when applied to 1/8 inch thick annealed glass.
4. Color: Clear.
5. Thickness Without Liner: 0.004 inch.

C. Decorative Plastic Film: Polyester type.
1. Application: Locations as indicated on drawings.
2. Series Type: Pattern. Custom Gradiation. Refer to Drawings.
3. Color: White.
4. Manufacturers:
    a. Basis of Design: Solyx Films, Gradients
    b. Other Manufacturers:
        1) 3M, FASARA, Glass finishes: Tsurugi SH2FGTG
        2) Kuraray America, Inc; Trosifol Decorative: www.kuraray.us.com/#sle.

3) Llumar, an Eastman Chemical Company; Decorative Window Film, Llumar: www.llumar.com/#sle.

D. Decorative Plastic Film: Polyester type.
   1. Series Type: Pattern. Frosted Matte.
   2. Color: White.
   3. Manufacturers:
      a. Basis of Design: Solyx Films, Frosted.
      b. Other Manufacturers
         1) 3M, FASARA, Glass finishes: Opaque White SH2MAOW
         2) Kuraray America, Inc; Trosifol Decorative: www.kuraray.us.com/#sle.
         3) Llumar, an Eastman Chemical Company; Decorative Window Film, Llumar: www.llumar.com/#sle.

E. Decorative Plastic Film: Polyester type.
   1. Application: Locations as indicated on drawings.
   2. Series Type: Pattern. Gradiation.
   3. Color: White.
   4. Manufacturers:
      a. 3M, FASARA, Glass finishes
      b. Kuraray America, Inc; Trosifol Decorative: www.kuraray.us.com/#sle.
      c. Llumar, an Eastman Chemical Company; Decorative Window Film, Llumar: www.llumar.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

2.07 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; non-bleeding, non-staining; 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. Manufacturers:
   1. Bostik Inc: www.bostik-us.com.
   2. Dow Corning Corporation: www.dowcorning.com/construction.
   3. Momentive Performance Materials, Inc: www.momentive.com.
   4. Pecora Corporation: www.pecora.com.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

2.08 ACCESSORIES

A. Setting Blocks: Neoprene, with 80 to 90 Shore A durometer hardness; ASTM C864 Option I. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x 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. 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; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black color.
   1. Width: As required for application.
   2. Thickness: As required for application.

D. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option I; 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, etc.

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 - DRY GLAZING METHOD (TAPE AND GASKET SPLINE GLAZING)

A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.

B. Cut glazing tape to length; install on glazing pane. Seal corners by butting tape and sealing junctions with butyl sealant.

C. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.

D. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.

E. Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.

F. Carefully trim protruding tape with knife.

3.06 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.

C. Install film tight to perimeter of glass and carefully trim film with razor sharp knife. Provide 1/16 inch to 1/8 inch gap at perimeter of glazed panel unless otherwise required. Do not score the glass.

3.07 FIELD QUALITY CONTROL

A. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.

B. Monitor and report installation procedures and unacceptable conditions.

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.

3.10 SCHEDULES

A. Refer to Drawings.

END OF SECTION 08 80 00

SECTION 09 05 61
COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings:
   1. Resilient tile and sheet.
   2. Carpet tile.
   3. Fluid-Applied Flooring.

B. Preparation of new concrete floor slabs for installation of floor coverings.

C. Testing of concrete floor slabs for moisture and alkalinity (pH).

D. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.
   1. Contractor shall perform all specified remediation of concrete floor slabs. If such remediation is indicated by testing agency's report and is due to a condition not under Contractor's control or could not have been predicted by examination prior to entering into the contract, a contract modification will be issued.

E. Patching compound.

F. Remedial floor coatings.

1.02 RELATED REQUIREMENTS

A. Section 01 40 00 - Quality Requirements: Additional requirements relating to testing agencies and testing.

B. Section 03 30 00 - Cast-in-Place Concrete: Moisture emission reducing curing and sealing compound for slabs to receive adhered flooring, to prevent moisture content-related flooring failures; to remain in place, not to be removed.

C. Section 03 30 00 - Cast-in-Place Concrete: Concrete admixture for slabs to receive adhered flooring, to prevent moisture content-related flooring failures.

D. Section 03 30 00 - Cast-in-Place Concrete: Limitations on curing requirements for new concrete floor slabs.

1.03 REFERENCE STANDARDS

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 50 mm [2 in.] Cube Specimens); 2024.

B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters, and Gypsum Concrete; 2020.

C. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

D. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

1.04 ADMINISTRATIVE REQUIREMENTS

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
   1. Moisture and alkalinity (pH) limits and test methods.
   2. Manufacturer's required bond/compatibility test procedure.

C. Remedial Materials Product Data (if required): Manufacturer's published data on each product to be used for remediation.

1. Manufacturer's qualification statement.
2. Certificate: Manufacturer's certification of compatibility with types of flooring applied over remedial product.
3. Test reports indicating compliance with specified performance requirements, performed by nationally recognized independent testing agency.
4. Manufacturer's installation instructions.

D. Testing Agency's Report:
1. Description of areas tested; include floor plans and photographs if helpful.
2. Summary of conditions encountered.
3. Moisture and alkalinity (pH) test reports.
4. Copies of specified test methods.
5. Recommendations for remediation of unsatisfactory surfaces.
6. Product data for recommended remedial coating.
7. Submit report not more than two business days after conclusion of testing.

E. Adhesive Bond and Compatibility Test Report.

1.06 QUALITY ASSURANCE

A. Contractor may perform adhesive and bond test with Contractor's own personnel or hire a testing agency.

B. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.
1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project Owner's project contact information.

C. Contractor's Responsibility Relating to Independent Agency Testing:
1. Provide access for and cooperate with testing agency.
2. Confirm date of start of testing at least 10 days prior to actual start.
3. Allow at least 4 business days on site for testing agency activities.
4. Achieve and maintain specified ambient conditions.
5. Notify Architect when specified ambient conditions have been achieved and when testing will start.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, handle, and protect products in accordance with manufacturer’s instructions and recommendations.

B. Deliver materials in manufacturer’s packaging; include installation instructions.

C. Keep materials from freezing.

1.08 FIELD CONDITIONS

A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.

B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

2.01 MATERIALS

A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:
1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.

2. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.
3. Products:
   a. ARDEX Engineered Cements; ARDEX Feather Finish: www.ardexamericas.com/#sle.
   b. H.B. Fuller Construction Products, Inc; TEC Feather Edge Skim Coat: www.tecspecialty.com/#sle.
   c. LATICRETE International, Inc; SKIM LITE: www.laticrete.com/#sle.
   d. USG Corporation; Durock Brand Advanced Skim Coat Floor Patch: www.usg.com/#sle.
   e. Substitutions: See Section 01 60 00 - Product Requirements.

B. Alternate Flooring Adhesive: Floor covering manufacturer's recommended product, suitable for the moisture and pH conditions present; low-VOC. In the absence of any recommendation from flooring manufacturer, provide a product recommended by adhesive manufacturer as suitable for substrate and floor covering and for conditions present.

C. Remedial Floor Coating (if required) : Single- or multi-layer coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.
   1. Thickness: As required for application and in accordance with manufacturer's installation instructions.
   2. Use product recommended by testing agency.

PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

A. Perform following operations in the order indicated:
   1. Existing concrete slabs (on-grade and elevated) with existing floor coverings:
      a. Visual observation of existing floor covering, for adhesion, water damage, alkaline deposits, and other defects.
      b. Removal of existing floor covering.
   2. Preliminary cleaning.
   3. Moisture vapor emission tests; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.
   4. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
   5. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
   6. Specified remediation, if required.
   7. Patching, smoothing, and leveling, as required.
   8. Other preparation specified.
   9. Adhesive bond and compatibility test.
   10. Protection.

B. Remediations:
   1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
   2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.
   3. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive

for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.02 PRELIMINARY CLEANING

A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.

B. Do not use solvents or other chemicals for cleaning.

3.03 MOISTURE VAPOR EMISSION TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F1869 and as follows.

D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.

F. Report: Report the information required by the test method.

3.04 INTERNAL RELATIVE HUMIDITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F2170 Procedure A and as follows.

D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.

F. Report: Report the information required by the test method.

3.05 ALKALINITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

3.06 PREPARATION

A. See individual floor covering section(s) for additional requirements.

B. Comply with requirements and recommendations of floor covering manufacturer.

C. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.

D. Do not fill expansion joints, isolation joints, or other moving joints.

3.07 ADHESIVE BOND AND COMPATIBILITY TESTING

A. Comply with requirements and recommendations of floor covering manufacturer.

3.08 APPLICATION OF REMEDIAL FLOOR COATING

A. Comply with requirements and recommendations of coating manufacturer.

3.09 APPLICATION OF REMEDIAL FLOOR TREATMENT

A. Comply with requirements and recommendations of treatment manufacturer.

3.10 PROTECTION

A. Cover prepared floors with building paper or other durable covering.

END OF SECTION 09 05 61

SECTION 09 21 16
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.

B. Metal stud wall framing.

C. Metal channel ceiling framing.

D. Acoustic insulation.

E. Gypsum sheathing.

F. Cementitious backing board.

G. Gypsum wallboard.

H. Joint treatment and accessories.

1.02 RELATED REQUIREMENTS

A. Section 05 40 00 - Cold-Formed Metal Framing: Structural steel stud framing.

B. Section 06 10 00 - Rough Carpentry: Building framing and sheathing.

C. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.

D. Section 07 25 00 - Weather Barriers: Water-resistive barrier over sheathing.

E. Section 07 26 00 - Vapor Retarders: Vapor-impermeable membranes.

F. Section 07 92 00 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

1.03 REFERENCE STANDARDS

A. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing; 2020.

B. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2015, with Errata (2020).

C. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2023.

D. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2023.

E. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

F. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.

G. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020.

H. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017 (Reapproved 2022).

I. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003 (Reapproved 2017).

J. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2024.

K. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.

L. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2023.

M. 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.

N. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2019.

O. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.

P. ASTM C1280 - Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing; 2018 (Reapproved 2023).

Q. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units; 2022, with Editorial Revision (2023).

R. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2024.

S. ASTM C1629/C1629M - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels; 2023.

T. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.

U. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

V. ASTM E413 - Classification for Rating Sound Insulation; 2022.

W. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).

X. GA-216 - Application and Finishing of Gypsum Panel Products; 2024.

Y. GA-226 - Application of Gypsum Board to Form Curved Surfaces; 2025.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the installation of gypsum board assemblies with size, location, and installation of service utilities.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data:
   1. Provide data on gypsum board, accessories, and joint finishing system.
   2. Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

C. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Store gypsum products and accessories indoors and keep above freezing. Elevate boards above floor, on nonwicking supports, in accordance with manufacturer's recommendations.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.

B. Interior Partitions, Indicated as Acoustic: 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. Grid Suspension Systems: Provide grid suspension systems in accordance with ASTM C840 and GA-216 complying with the following:
   1. ICC-ES Evaluation Report No. _____.

2.02 METAL FRAMING MATERIALS

A. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S220 or equivalent.

B. Manufacturers - Metal Framing, Connectors, and Accessories:
   1. ClarkDietrich; ____: www.clarkdietrich.com/#sle.
   2. MarinoWARE; ____: www.marinoware.com/#sle.
   3. Phillips Manufacturing Co; ____: www.phillipsmfg.com/#sle.
   4. SCAFCO Corporation; _____: www.scafco.com/#sle.
   5. Steel Construction Systems; _____: www.steelconsystems.com/#sle.
   6. Substitutions: See Section 01 60 00 - Product Requirements.

C. Nonstructural Framing System Components: AISI S220; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf.
   1. Studs: C-shaped with knurled or embossed faces.
   2. Runners: U shaped, sized to match studs.

D. Partition Head To Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short and fastened as indicated on drawings.

E. Non-structural Framing Accessories:
   1. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
   2. Partial Height Wall Framing Support: Provides stud reinforcement and anchored connection to floor.
      a. Materials: ASTM A36/A36M formed sheet steel support member with factory-welded ASTM A1003/A1003M steel plate base.
      b. Height: 35-3/4 inches.
      c. Products:
         1) ClarkDietrich; Pony Wall (PW): www.clarkdietrich.com/#sle.
         2) Substitutions: See Section 01 60 00 - Product Requirements.

F. Grid Suspension Systems: Steel grid system of main tees and support bars connected to structure using hanging wire.
   1. Products:
      a. CertainTeed Corporation; ____: www.certainteed.com/ceilings-and-walls/#sle.
      b. USG Corporation; Drywall Suspension System: www.usg.com/#sle.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:
   1. American Gypsum Company: www.americangypsum.com/#sle.
   2. CertainTeed Corporation: www.certainteed.com/#sle.
   3. Georgia-Pacific Gypsum: www.gpgypsum.com/#sle.
   4. USG Corporation: www.usg.com/#sle.
   5. Substitutions: See Section 01 60 00 - 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: Use for ceilings, unless otherwise indicated.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
      a. Mold resistant board is required at all locations.
   3. Thickness:
      a. Vertical Surfaces: 5/8 inch.
      b. Ceilings: 1/2 inch.
   4. Mold-Resistant, Paper-Faced Products:

a. American Gypsum Company; M-Bloc Type X: www.americangypsum.com/#sle.
b. CertainTeed Corporation; M2Tech 5/8" Type X Moisture & Mold Resistant Drywall: www.certainteed.com/#sle.
c. Georgia-Pacific Gypsum; ToughRock Fireguard X Mold-Guard: www.gpgypsum.com/#sle.
d. USG Corporation; Sheetrock Brand EcoSmart Panels Mold Tough Firecode X 5/8 in. (15.9 mm): www.usg.com/#sle.
e. Substitutions: See Section 01 60 00 - Product Requirements.

C. Impact Resistant Wallboard:
1. Application: All walls for the first 8' .
2. Surface Abrasion: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
3. Indentation: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
4. Soft Body Impact: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
5. Hard Body Impact: Level 2, minimum, when tested in accordance with ASTM C1629/C1629M.
6. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
7. Paper-Faced Type: Gypsum wallboard, as defined in ASTM C1396/C1396M.
8. Type: Fire-resistance-rated Type X, UL or WH listed.
9. Thickness: 5/8 inch.
10. Edges: Tapered.

D. Backing Board For Wet Areas: One of the following products:
1. Application: Surfaces behind tile in wet areas, including manufactured housing, tub and shower surrounds, and shower ceilings.
2. Application: Horizontal surfaces behind tile in wet areas including countertops.
3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
4. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
a. Thickness: 1/2 inch.

E. Ceiling Board: Special sag resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Application: Ceilings, unless otherwise indicated.
2. Thickness: 1/2 inch.
3. Edges: Tapered.

F. 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. Fungal Resistance: No fungal growth when tested in accordance with ASTM G21.
4. Glass Mat Faced Sheathing: Glass mat faced gypsum substrate as defined in ASTM C1177/C1177M.
5. Core Type: Type X.
6. Type X Thickness: 5/8 inch.
7. Edges: Square.
8. Glass Mat Faced Products:
a. American Gypsum Company; M-Glass Exterior Sheathing Type X: www.americangypsum.com/#sle.
b. CertainTeed Corporation; GlasRoc Type X Exterior Sheathing: www.certainteed.com/#sle.
c. Georgia-Pacific Gypsum; DensGlass Sheathing: www.gpgypsum.com/#sle.

d. USG Corporation; Securock ExoAir 430 Panel USGX 5/8 in. (15.9 mm): www.usg.com/#sle.

G. Exterior Soffit Board: Exterior gypsum soffit board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Application: Ceilings and soffits in protected exterior areas, unless otherwise indicated.
2. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X.
3. Type X Thickness: 5/8 inch.
4. Edges: Tapered.

2.04 GYPSUM BOARD ACCESSORIES

A. Acoustic Insulation: ASTM C665; preformed mineral-fiber, friction fit type, unfaced; thickness depth of stud.

B. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.

C. Water-Resistive Barrier: See Section 07 25 00.

D. Vapor Retarder: See Section 07 26 00.

E. Finishing Accessories: ASTM C1047, galvanized steel sheet ASTM A924/A924M G90, unless noted otherwise.
1. Types: As detailed or required for finished appearance.
2. Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed panel edges.
3. Products:
a. Phillips Manufacturing Co: www.phillipsmfg.com/#sle.
b. Stockton Products: www.stocktonproducts.com/#sle.
c. Trim-tex, Inc: www.trim-tex.com/#sle.
d. Substitutions: See Section 01 60 00 - Product Requirements.

F. Decorative Metal Trim:
1. Material: Extruded aluminum alloy 6063-T5 temper.
2. Finish: Anodized, as selected by architect color.
3. Type: Profile as selected from manufacturer's standard range.
4. Manufacturer: Inpro Corp

G. Joint Materials: ASTM C475/C475M.
1. Fiberglass Tape: 2 inch wide, coated glass fiber tape for joints and corners.
2. Joint Compound: Setting type, field-mixed.

H. Finishing Compound: Surface coat and primer, takes the place of skim coating.

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. Adhesive for Attachment to Wood, ASTM C557:

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 C1007AISI S220 and manufacturer's instructions.

B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.

C. Studs: Space studs at 16 inches on center.
1. Extend partition framing to structure in all locations.

2. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs with continuous bridging.

D. Blocking: Install wood blocking for support of:
1. Framed openings.
2. Wall-mounted cabinets.
3. Plumbing fixtures.
4. Toilet accessories.
5. Wall-mounted door hardware.

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.

3.04 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.

C. Exterior Sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.
1. Paper-Faced Sheathing: Immediately after installation, protect from weather by application of water-resistive barrier.

D. Exterior Soffits: Install exterior soffit board perpendicular to framing, with staggered end joints over framing members or other solid backing.

E. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.

F. Installation on Wood Framing: For nonrated assemblies, install as follows:
1. Single-Layer Applications: Adhesive application.

G. Curved Surfaces: Apply gypsum board to curved substrates in accordance with GA-226.

3.05 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as follows:
1. Not more than 30 feet apart on walls and ceilings over 50 feet long.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

D. Decorative Trim: Install at locations shown on drawings and in accordance with manufacturer's instructions.

3.06 JOINT TREATMENT

A. Paper Faced Gypsum Board: Use fiberglass joint tape, embed with drying type joint compound and finish with drying type joint compound.

B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and walls receiving vinyl wall graphics.
2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
3. Level 1: Fire-resistance-rated wall areas above finished ceilings, whether or not accessible in the completed construction.

C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.

D. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.07 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

3.08 CLEANING

A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.

3.09 PROTECTION

A. Protect installed gypsum board assemblies from subsequent construction operations.

END OF SECTION 09 21 16

SECTION 09 30 00
TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Tile for wall applications.

B. Ceramic accessories.

C. Ceramic trim.

D. Non-ceramic trim.

1.02 RELATED REQUIREMENTS

A. Section 07 13 00 - Sheet Waterproofing.

B. Section 07 92 00 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.

C. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

D. Section 09 21 16 - 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); 2024.

B. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2023.

C. ANSI A108.1b - Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set, Modified Dry-Set, or Improved Modified Dry-Set Cement Mortar; 2023.

D. 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, Modified Dry-Set, or Improved Modified Dry-Set Cement Mortar; 2023.

E. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesive or Water Cleanable Tile-Setting Epoxy Adhesive; 2023.

F. ANSI A108.5 - Setting of Ceramic Tile with Dry-Set Cement Mortar, Modified Dry-Set Cement Mortar, EGP (Exterior Glue Plywood) Modified Dry-Set Cement Mortar, or Improved Modified Dry-Set Cement Mortar; 2023.

G. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 2017 (Reaffirmed 2022).

H. 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).

I. ANSI A108.19 - American National Standard Specifications for Interior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs by the Thin-Bed Method Bonded with Modified Dry-Set Cement Mortar or Improved Modified Dry-Set Cement Mortar; 2020.

J. ANSI A108.20 - American National Standard Specifications for Exterior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs; 2020.

K. ANSI A118.1 - American National Standard Specifications for Dry-Set Cement Mortar; 2023.

L. 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.

M. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar; 2023.

N. ANSI A118.6 - American National Standard Specifications for Standard Cement Grouts for Tile Installation; 2019.

O. ANSI A118.7 - American National Standard Specifications for High Performance Cement Grouts for Tile Installation; 2019.

P. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2023.

Q. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2014 (Reaffirmed 2019).

R. ANSI A118.15 - American National Standard Specifications for Improved Modified Dry-Set Cement Mortar; 2023.

S. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2022.

T. ANSI A137.3 - American National Standard Specifications for Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs; 2017.

U. ASTM D4068 - Standard Specification for Chlorinated Polyethylene (CPE) Sheeting for Concealed Water-Containment Membrane; 2017 (Reapproved 2022).

V. ASTM D4551 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Flexible Concealed Water-Containment Membrane; 2022.

W. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.

X. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.

Y. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

1.04 SUBMITTALS

A. See Section 01 30 00 - 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, thresholds, ceramic accessories, and setting details.

D. Samples: Mount tile and apply grout on two plywood panels, minimum 18 by 18 inches in size illustrating pattern, color variations, and grout joint size variations.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.

B. Installer Qualifications:
   1. Company specializing in performing tile installation, with minimum of five years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.07 FIELD CONDITIONS

A. Do not install solvent-based products in an unventilated environment.

B. Maintain ambient and substrate temperature above 50 degrees F and below 100 degrees F during installation and curing of setting materials.

PART 2 PRODUCTS

2.01 TILE

A. Manufacturers: Refer to finish schedule for manufacture and type .
   1. Dal-Tile Corporation; _____: www.daltile.com/#sle.
   2. Urban Coast Tile: www.urbancoastile.com
   3. Garden State Tile: www.gstile.com
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 TRIM AND ACCESSORIES

A. Ceramic Accessories: Glazed finish, same color and finish as adjacent field tile; same manufacturer as tile.

B. Non-Ceramic Trim: Satin natural anodized extruded aluminum, style and dimensions to suit application, set with tile mortar or adhesive.
   1. Applications:
      a. Open edges of wall tile.
      b. Inside and outside wall corners.
      c. Thresholds at door openings.
      d. Floor and wall expansion and control joints.
      e. Floor-to-wall joints.
      f. Borders and other trim as indicated on drawings.
   2. Products:
      a. Schluter-Systems; Schiene: www.schluter.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

2.03 SETTING MATERIALS

A. Provide setting and grout materials from same manufacturer.

B. Manufacturers:
   1. ARDEX Engineered Cements; _____: www.ardexamericas.com/#sle.
   2. Custom Building Products; _____: www.custombuildingproducts.com/#sle.
   3. H.B. Fuller Construction Products, Inc; ____: www.tecspecialty.com/#sle.
   4. LATICRETE International, Inc; _____: www.laticrete.com/#sle.
   5. Mapei Corporation; _____: www.mapei.com/#sle.
   6. Substitutions: See Section 01 60 00 - Product Requirements.

C. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4.
   1. Applications: Use this type of bond coat where indicated, and where no other type of bond coat is indicated.
   2. Products:
      a. ARDEX Engineered Cements; ARDEX X 5: www.ardexamericas.com/#sle.
      b. Custom Building Products; ProLite Premium Rapid Setting Large Format Tile Mortar, with Multi-Surface Bonding Primer: www.custombuildingproducts.com/#sle.
      c. H.B. Fuller Construction Products, Inc; TEC TotalFlex 110 Universal Mortar: www.tecspecialty.com/#sle.
      d. Mapei Corporation; Adesilex P10 Mosaic & Glass Tile: www.mapei.com/#sle.
      e. Substitutions: See Section 01 60 00 - Product Requirements.

D. Improved Latex-Portland Cement Mortar Bond Coat: ANSI A118.15.
   1. Applications: Use this type of bond coat where Large and Heavy Tile (LHT) mortar is indicated.
   2. Products:
      a. ARDEX Engineered Cements; S 28: www.ardexamericas.com/#sle.
      b. H.B. Fuller Construction Products, Inc; TEC TotalFlex 150 Universal Mortar: www.tecspecialty.com/#sle.
      c. LATICRETE International, Inc; MULTIMAX LITE: www.laticrete.com/#sle.

d. Mapei Corporation; Granirapid System: www.mapei.com/#sle.
e. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 GROUTS

A. Provide setting and grout materials from same manufacturer.

B. Manufacturers:
1. ARDEX Engineered Cements; _____: www.ardexamericas.com/#sle.
2. Custom Building Products; _____: www.custombuildingproducts.com/#sle.
3. H.B. Fuller Construction Products, Inc; _____: www.tecspecialty.com/#sle.
4. LATICRETE International, Inc; _____: www.laticrete.com/#sle.
5. Mapei Corporation; _____: www.mapei.com/#sle.
6. Substitutions: See Section 01 60 00 - Product Requirements.

C. 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.
4. Products:
a. ARDEX Engineered Cements; ARDEX FL: www.ardexamericas.com/#sle.
b. Custom Building Products; Prism Color Consistent Grout: www.custombuildingproducts.com/#sle.
c. H.B. Fuller Construction Products, Inc; TEC AccuColor Plus Grout: www.tecspecialty.com/#sle.
d. LATICRETE International, Inc; LATICRETE PERMACOLOR Grout: www.laticrete.com/#sle.
e. Substitutions: See Section 01 60 00 - Product Requirements.

D. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
1. Applications: Where indicated.
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.

B. Tile Sealant: Two-component, semi-rigid, 100 percent epoxy sealant; resistant to rolling loads.
1. Applications: Nonmoving and saw-cut control and construction joints in tile flooring.

C. Grout Sealer: Liquid-applied, moisture and stain protection for existing or new Portland cement grout.
1. Composition: Water-based colorless silicone.

D. Grout Release: Temporary, water-soluble pre-grout coating.

2.06 ACCESSORY MATERIALS

A. Concrete Floor Slab Crack Isolation Membrane: Material complying with ANSI A118.12; not intended as waterproofing.
1. Crack Resistance: No failure at 1/8 inch gap, minimum.

B. Waterproofing Membrane at Floors: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
1. Crack Resistance: No failure at 1/16 inch gap, minimum; comply with ANSI A118.12.
2. Fluid or Trowel Applied Type:
a. Material: Synthetic rubber or Acrylic.

b. Thickness: 25 mils, minimum, dry film thickness.
c. Products:
1) ARDEX Engineered Cements; ARDEX 8+9: www.ardexamericas.com/#sle.
2) Custom Building Products; RedGard Crack Prevention and Waterproofing Membrane: www.custombuildingproducts.com/#sle.
3) H.B. Fuller Construction Products, Inc; TEC HydraFlex Waterproofing Crack Isolation Membrane: www.tecspecialty.com/#sle.
4) LATICRETE International, Inc; LATICRETE HYDRO BAN: www.laticrete.com/#sle.
5) Mapei Corporation; Mapelastic AquaDefense: www.mapei.com/#sle.

3. Bonded Sheet Membrane Type:
a. Material: PVC sheet membrane with polyester fleece laminated to both sides, 40 mils thick, nominal.
b. Material: Polyethylene sheet membrane with nonwoven fabric laminated to both sides, 20 to 30 mils thick, nominal.
c. Products:
1) ARDEX Engineered Cements; ARDEX TLT 716: www.ardexamericas.com/#sle.
2) COMPOTITE Corporation; Composeal Gold: www.compotite.com/#sle.
3) LATICRETE International, Inc; LATICRETE HYDRO BAN Sheet Membrane: www.laticrete.com/#sle.
4) Mapei Corporation; Mapeguard WP 200 Membrane: www.mapei.com/#sle.
5) Substitutions: See Section 01 60 00 - Product Requirements.

C. Waterproofing Membrane at Showers and Tiled Tubs: 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. Material: Synthetic rubber.
b. Material: Acrylic.
c. Thickness: 25 mils, minimum, dry film thickness.
d. Products:
1) ARDEX Engineered Cements; ARDEX 8+9: www.ardexamericas.com/#sle.
2) LATICRETE International, Inc; LATICRETE HYDRO BAN: www.laticrete.com/#sle.
3) USG Corporation; Durock Brand Liquid Waterproofing Membrane: www.usg.com/#sle.
4) Sika Corp; SikaTile 100 Moisture Guard: www.sika.com/#sle.
5) Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subfloor 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 subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.

3.02 INSTALLATION - GENERAL

A. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

B. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

C. 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.

D. Form internal angles square and external angles bullnosed.

E. Install ceramic accessories rigidly in prepared openings.

F. Install non-ceramic trim in accordance with manufacturer's instructions.

G. Sound tile after setting. Replace hollow sounding units.

H. Keep control and expansion joints free of mortar, grout, and adhesive.

I. Prior to grouting, allow installation to completely cure; minimum of 48 hours.

3.03 INSTALLATION - SHOWERS AND BATHTUB WALLS

A. At tiled shower receptors install in accordance with TCNA (HB) Method B415, mortar bed floor, and W244, thin-set over cementitious backer unit walls.

3.04 INSTALLATION - WALL TILE

A. Over cementitious backer units on studs, install in accordance with TCNA (HB) Method W244, using membrane at toilet rooms.

B. Over interior concrete and masonry install in accordance with TCNA (HB) Method W202, thin-set with dry-set or latex-Portland cement bond coat.

3.05 CLEANING

A. Clean tile and grout surfaces.

3.06 PROTECTION

A. Do not permit traffic over finished floor surface for 4 days after installation.

3.07 SCHEDULE

A. Refer to drawing and schedules for tile type, size, and patters.

END OF SECTION 09 30 00

SECTION 09 51 00
ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

C. Supplementary acoustical insulation above ceiling.

1.02 RELATED REQUIREMENTS

A. Section 05 31 00 - Steel Decking: Placement of special anchors or inserts for suspension system.

B. Section 21 13 00 - Fire-Suppression Sprinkler Systems: Sprinkler heads in ceiling system.

C. Section 23 37 00 - Air Outlets and Inlets: Air diffusion devices in ceiling.

D. Section 26 51 00 - Interior Lighting: Light fixtures in ceiling system.

E. Section 27 51 16 - Public Address Systems: Speakers in ceiling system.

F. Section 28 46 00 - Fire Detection and Alarm: Fire alarm components in ceiling system.

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 C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2022.

C. 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; 2014.

D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2023.

E. CHPS (HPPD) - High Performance Products Database; Current Edition.

F. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.

G. 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 30 00 - 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 x6 inch in size illustrating material and finish of acoustical units.

E. Samples: Submit two samples each, 6 inches long, of suspension system main runner.

F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.

2. Extra Acoustical Units: 20 sq ft of each type and size.

1.06 QUALITY ASSURANCE

A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.07 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acoustic Tiles/Panels:
   1. Armstrong World Industries, Inc: www.armstrong.com.
   2. CertainTeed Corporation: www.certainteed.com.
   3. USG: www.usg.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Suspension Systems:
   1. Same as for acoustical units.

2.02 ACOUSTICAL UNITS

A. Acoustical Panels Type ACT-1: Painted mineral fiber,ASTM E1264 Type III, with the following characteristics:
   1. Size: 24 by 24 inches.
   2. Thickness: 3/4 inches.
   3. Composition: Wet felted.
   4. Light Reflectance: 85 percent, determined in accordance with ASTM E1264.
   5. NRC Range: 0.70 to 0.75, determined in accordance with ASTM E1264.
   6. Ceiling Attenuation Class (CAC): 40, determined in accordance with ASTM E1264.
   7. Edge: Square.
   8. Surface Color: White.
   9. Surface Pattern: Non-directional fissured.
   10. Suspension System: Exposed grid.
   11. Products:
      a. "SchoolZone Fine Fissured 1717" by Armstrong.
      b. Other acceptable manufacturers: USG Corporation: www.usg.com
      c. Substitutions: See Section 01 60 00 - Product Requirements.

B. Acoustical Panels Type ACT-2: Painted mineral fiber,ASTM E1264 Type III, with the following characteristics:
   1. Size: 24 by 24 inches.
   2. Thickness: 3/4 inches.
   3. Composition: Wet felted.
   4. Light Reflectance: 86 percent, determined in accordance with ASTM E1264.
   5. NRC Range: 0.65 to 0.70, determined in accordance with ASTM E1264.
   6. Ceiling Attenuation Class (CAC): 35, determined in accordance with ASTM E1264.
   7. Edge: Square.
   8. Surface Color: White.
   9. Surface Pattern: Non-directional fissured.
   10. Suspension System: Exposed grid.
   11. Location: As scheduled.
   12. Basis of Design product: Ultima Health Zone by Armstrong.

a. Other acceptable manufacturers:
b. USG Corporation: www.usg.com
c. Substitutions: See Section 01 60 00 - Product Requirements.

C. Acoustical Panels Type ACT-3: Acoustical Panel Ceiling
1. Manufacturer: Armstrong
2. Basis of Design: Invisacoustics
3. Composition: Mineral Fiber
4. Color: White
5. Size: 24 in x 48 in
6. Edge Profile: Square
7. NRC ASTM C 423 0.75
8. Flame Spread: ASTM E 1264; Class A

D. Acoustical Panels Type ACT-4: Tectum Shapes and or Clouds
1. Manufacturer: Armstrong
2. Surface Texture: Coarse
3. Composition: Aspen wood fibers bonded with inorganic hydrulic cement.
4. Color: Refer to drawings
5. Size: Refer to drawings
6. Thickness: 2"
7. Flame Spread: ASTM E 1264
8. Metal suspension systems composed of double-web steel construction with 15/16" type exposed flange. Air crapt cable to be used to hang suspension systems.

E. Acoustical Panels Type[ACT-5]: Painted mineral fiber, ASTM E1264Type III, with the following characteristics:
1. Size: 24 by 24 inches.
2. Thickness: 3/4 inches.
3. Composition: Wet felted.
4. Light Reflectance: [86] percent, determined in accordance with ASTM E1264.
5. NRC Range: [0.85] determined in accordance with ASTM E1264.
6. Ceiling Attenuation Class (CAC): [35], determined in accordance with ASTM E1264.
7. Edge: Square.
8. Surface Color: White.
9. Surface Pattern: Non-directional fissured.
10. Suspension System: Exposed grid.
11. Location: As scheduled.
12. Basis of Design product: Ultima High NRC 0.85 NRC.
13. USG Corporation: www.usg.com
14. Substitutions: See Section 01 60 00-Product Requirements.

2.03 SUSPENSION SYSTEM(S)

A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold down clips, stabilizer bars, clips, and splices as required.
1. Basis of Design for ACT-1, ACT-3 and ACT-5: Armstrong Prelude XL

B. Exposed Steel Suspension System: Formed steel, commercial quality cold rolled; heavy-duty.
1. Profile: Tee; 15/16 inch wide face.
2. Construction: Double web.
3. Finish: White painted.

2.04 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

B. Hanger Wire: 12 gauge, 0.08 inch galvanized steel wire.

C. Hold-Down Clips: Manufacturer's standard clips to suit application.

D. Perimeter Moldings: Same metal and finish as grid.
   1. Angle Molding: L-shaped, for mounting at same elevation as face of grid.
   2. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.
   3. Size: 6 inch high unless noted otherwise on Drawings.

E. Metal Edge Trim for "Cloud" Suspension Systems: Steel or extruded aluminum; provide attachment clips, splice plates, and preformed corner pieces for complete trim system.
   1. Trim Height: 6 inch.
   2. Finish: Baked enamel.
   3. Color: White.
   4. Products:
      a. USG Corporation; Compasso Suspension Trim: www.usg.com/ceilings/#sle.

F. Touch-up Paint: Type and color to match acoustical and grid units.

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 ASTM C636/C636M, ASTM E580/E580M, 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. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Use longest practical lengths.

E. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.

F. Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.

G. Suspension System, Non-Seismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

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. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.

K. Do not eccentrically load system or induce rotation of runners.

L. 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.

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. Fit border trim neatly against abutting surfaces.

D. Install units after above-ceiling work is complete.

E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

F. Cutting Acoustical Units:
   1. Make field cut edges of same profile as factory edges.

G. Where round obstructions occur, provide preformed closures to match perimeter molding.

H. Install hold-down clips on each panel to retain panels tight to grid system; comply with fire rating requirements.

I. Install hold-down clips on panels within 20 ft of an exterior door.

3.04 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

3.05 SCHEDULE

A. Refer to Drawings.

END OF SECTION 09 51 00

SECTION 09 54 26
SUSPENDED WOOD CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wood veneer panels.

B. Linear wood planks.

C. Metal suspension system.

1.02 RELATED REQUIREMENTS

A. Section 09 51 00 - Acoustical Ceilings: Metal suspension systems.

1.03 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

B. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

C. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

D. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2022.

E. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2013.

F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.

G. 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; 2014.

H. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2023.

I. CISCA (WC) - Wood Ceilings Technical Guidelines; 2009.

1.04 SUBMITTALS

A. See Section 01 30 00 - 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. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements for additional provisions.
   2. Wood Ceiling Components: Provide a quantity equal to 2 percent of total product installed.

1.05 QUALITY ASSURANCE

A. Designer Qualifications for Seismic Design: Perform design under direct supervision of Professional Structural Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with at least three years documented experience.

C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

1.06 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.

1.07 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.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Suspended Wood Ceilings:
   1. Basis of Design
      a. Armstrong World Industries, Inc; Woodworks: www.armstrongceilings.com/#sle.
   2. Certainteed Architectural; _____: www.certainteed.com/ceilings-and-walls/#sle.
   3. Rulon International; _____: www.rulonco.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 SUSPENDED WOOD CEILING SYSTEM

A. Performance Requirements:
   1. Design for maximum deflection of 1/360 of span.

B. Linear Wood Planks: Composite wood core with wood veneer finish.
   1. Basis of Design: Armstrong Suspended Wood Linear Veneer Panel with Biocoustic Black Infill.
   2. Type: Pre-assembled module of linear planks with battens attached perpendicularly to back of planks.
      a. Module Size: 24 by 96 inches, nominal.
      b. Plank Thickness: 3/4 inch.
      c. Acoustical Backer: Fiberglass, 1 inch thick.
         1) Color: Black.

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.
      a. Materials:
         1) Steel Grid: ASTM A653/A653M, G30 coating, unless otherwise indicated.
   2. Exposed Suspension System: Hot-dipped galvanized steel grid and cap.
      a. Structural Classification: Heavy-duty, when tested in accordance with ASTM C635/C635M.
      b. Profile: Tee; 15/16 inch face width.
      c. Finish/Color: Baked enamel, black.
   3. 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, seismic requirements and 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. Layout wood ceiling components in pattern according to reflected ceiling plan and as shown on shop drawings.

B. 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. 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 acoustical backer above wood ceiling components; fit tight between grid members.

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 09 54 26

SECTION 09 65 00
RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Resilient tile flooring.

B. Resilient base.

C. Resilient stair accessories.

D. Installation accessories.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied resilient flooring.

B. Section 03 54 00 - Cast Underlayment.

C. Section 09 05 61 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.

D. Section 26 05 26 - Grounding and Bonding for Electrical Systems: Grounding and bonding of static control flooring to building grounding system.

1.03 REFERENCE STANDARDS

A. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2023.

B. ASTM E2179 - Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors; 2003 (Reapproved 2016).

C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.

D. ASTM F970 - Standard Test Method for Measuring Recovery Properties of Floor Coverings after Static Loading; 2022.

E. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile; 2025.

F. ASTM F1700 - Standard Specification for Solid Vinyl Floor in Modular Format such as Tile(s) or Plank(s); 2025.

G. ASTM F1861 - Standard Specification for Resilient Wall Base; 2021 (Reapproved 2025).

H. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

I. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

J. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2015.

K. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; 2018.

1.04 SUBMITTALS

A. See Section 01 30 00 - 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. Shop Drawings: Indicate seaming plans and floor patterns.

D. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.

E. Verification Samples: Submit two samples, 6 by 6 inch in size illustrating color and pattern for each resilient flooring product specified.

F. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of subfloor is acceptable.

G. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Flooring Material: 50 square feet of each type and color.
   3. Extra Wall Base: 20 linear feet of each type and color.
   4. Extra Stair Materials: Quantity equivalent to 5 percent of each type and color.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in installing specified flooring with minimum three years documented 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. Protect roll materials from damage by storing on end.

1.07 FIELD CONDITIONS

A. Maintain temperature in storage area between 55 degrees F and 90 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 55 degrees F.

PART 2 PRODUCTS

2.01 TILE FLOORING

A. Luxury Vinyl Tile: Solid vinyl with color and pattern throughout thickness.
   1. Manufacturers:
      a. Mannington Commercial; _____: www.manningtoncommercial.com#sle.
      b. Milliken: www.milliken.com
      c. Armstrong Flooring: www.armstrongflooring.com
      d. Interface: www.interface.com
      e. As indicated on drawings.
      f. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Minimum Requirements: Comply with ASTM F1700, of Class corresponding to type specified.
   3. Pattern: As indicated on drawings..
   4. Color: As indicated on drawings.

B. Rubber Tile - Type ____: Homogeneous, color and pattern throughout thickness.
   1. Manufacturers:
      a. Johnsonite, a Tarkett Company; _____: www.johnsonite.com/#sle.
      b. Mannington Commercial; _____: www.manningtoncommercial.com#sle.
      c. Roppe Corporation; Rubber Tile: www.roppe.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Minimum Requirements: Comply with ASTM F1344, of Class corresponding to type specified.
   3. Size: As indicated on drawings nominal.

4. Total Thickness: 0.125 inch.
5. Texture: Hammered.
6. Color: As indicated on drawings.

2.02 STAIR COVERING

A. Stair Treads: Rubber; full width and depth of stair tread and riser in one piece; tapered thickness; nosing not less than 1-3/4 inch deep.
   1. Minimum Requirements: Comply with ASTM F2169, Type TS, rubber, vulcanized thermoset.
   2. Nominal Thickness: 0.250 inch.
   3. Nosing: Square.
   4. Color: To be selected by Architect from manufacturer's full range.
   5. Style: Hammered Texture with Visually Impaired Rubber Insert.
   6. Color: Solid.
   7. Manufacturers:
      a. Basi
      b. Tarkett Company: commercial.tarkett.com.
      c. Roppe Corp: www.roppe.com.
   8. Location: As indicated on drawings.

2.03 RESILIENT BASE

A. Resilient Base: ASTM F1861, Type TP, rubber, thermoplastic; top set Style B, Cove.
   1. Manufacturers:
      a. Tarkett Company; _____: commercial.tarkett.com
      b. Mannington Commercial; _____: www.manningtoncommercial.com#sle.
      c. Roppe Corporation; Contours Profiled Wall Base System: www.roppe.com/#sle.
      d. As indicated on drawings.
      e. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648, NFPA 253, ASTM E 648, or NFPA 253.
   3. Height: 4 inch.
   4. Thickness: 0.125 inch.
   5. Finish: Satin.
   6. Length: Roll.
   7. Color: As indicated on drawings.
   8. Color: Color as selected from manufacturer's standards.

2.04 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

B. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.

C. Moldings, Transition and Edge Strips: Rubber Material. Profile as indicated on drawings.

D. Tactile Warning Surface: As indicated on drawings.

E. Filler for Coved Base: Plastic.

F. 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. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient 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 resilient flooring manufacturer and adhesive materials manufacturer.

C. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Remove existing resilient flooring and flooring adhesives; follow the recommendations of RFCI (RWP).

B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

C. Remove subfloor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with subfloor filler to achieve smooth, flat, hard surface.

D. Prohibit traffic until filler is fully cured.

E. Clean substrate.

F. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

3.03 INSTALLATION - GENERAL

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install in accordance with manufacturer's written instructions.

C. Adhesive-Applied Installation:

D. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.

E. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

F. Spread only enough adhesive to permit installation of materials before initial set.

G. Fit joints and butt seams tightly.

H. Set flooring in place, press with heavy roller to attain full adhesion.

I. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.

J. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
   1. Metal Strips: Attach to substrate before installation of flooring using stainless steel screws.
   2. Resilient Strips: Attach to substrate using adhesive.

K. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

L. Install flooring in recessed floor access covers, maintaining floor pattern.

M. At movable partitions, install flooring under partitions without interrupting floor pattern.

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 loose-laid tile, fit interlocking edges tightly.

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 exposed ends, 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.

3.06 INSTALLATION - STAIR COVERINGS

A. Install stair coverings in one piece for full width and depth of tread.

B. Adhere over entire surface. Fit accurately and securely.

3.07 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's written instructions.

3.08 PROTECTION

A. Prohibit traffic on resilient flooring for 48 hours after installation.

3.09 SCHEDULE

A. Refer to Floor Finish Drawing.

END OF SECTION 09 65 00

SECTION 09 65 66
RESILIENT ATHLETIC FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Vinyl sheet flooring, adhesively installed.

B. Painted game lines.

1.02 RELATED REQUIREMENTS

A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied flooring.

C. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

1.03 REFERENCE STANDARDS

A. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).

B. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015 (Reapproved 2021).

C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.

D. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

E. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

F. ASTM F2772 - Standard Specification for Athletic Performance Properties of Indoor Sports Floor Systems; 2011 (Reapproved 2019).

G. CHPS (HPPD) - High Performance Products Database; Current Edition.

H. DIN EN 14904 - Surfaces for Sports Areas – Indoor Surfaces for Multi-Sports Use – Specification; 2006.

I. SCS (CPD) - SCS Certified Products; Current Edition.

J. UL (GGG) - GREENGUARD Gold Certified Products; Current Edition.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's printed data sheets for products specified.

C. Shop Drawings: Fabrication and installation details, and layout, colors, and widths of game lines and equipment locations.

D. Selection Samples: Manufacturer's color charts for flooring materials specified and game line paints, indicating full range of colors and textures available.

E. Verification Samples: Actual flooring material specified, not less than 12 inch square, mounted on solid backing.
   1. Include samples of game lines, illustrating colors selected.

F. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

G. Manufacturer's Instructions: Indicate standard and special installation procedures.

H. Manufacturer's qualification statement.

I. Installer's qualification statement.

J. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Flooring Material: 10 square yards matching installed flooring.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least 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.

C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to project site in unopened containers clearly labeled with manufacturer's name and identification of contents.

B. Store materials in dry and clean location until needed for installation. During installation, handle in a manner that will prevent marring and soiling of finished surfaces.

1.07 FIELD CONDITIONS

A. Maintain temperature in spaces to receive adhesively installed resilient flooring within range of 70 to 95 degrees F for not less than 48 hours before the beginning of installation and for not less than 48 hours after installation has been completed. Subsequently, do not allow temperature in installed spaces to drop below 50 degrees F or to go above 100 degrees F.

PART 2 PRODUCTS

2.01 PREFORMED ATHLETIC FLOORING

A. Manufacturers:
   1. Basis of Design: Omnisports HPL 9mm - Prefabricated sport surface with wood flooring design and slightly textured embossed surface as supplied by Tarkett
   2. Burke Flooring; ____: www.burkeflooring.com/#sle.
   3. Robbins Sports Surfaces; _____: www.robbinsfloor.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ACCESSORIES

A. Leveling Compound: Latex-modified cement formulation as recommended by flooring manufacturer for substrate conditions.

B. Flooring Adhesive: Waterproof; types recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates for conditions detrimental to installation of athletic flooring. Proceed with installation only after unsatisfactory conditions have been corrected.

B. 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 athletic flooring to substrate.

C. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).
   1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

3.02 PREPARATION

A. Concrete: Use leveling compound as necessary to achieve substrate flatness of plus or minus 1/8 inch within 10 ft radius.

B. Remove coatings that are incompatible with flooring adhesives, using methods recommended by flooring manufacturer.

C. Broom clean areas to receive athletic flooring immediately before beginning installation.

3.03 INSTALLATION

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install in accordance with manufacturer's written instructions.

3.04 CLEANING

A. Clean flooring using methods recommended by manufacturer.

3.05 PROTECTION

A. Protect finished athletic flooring from construction traffic to ensure that it is without damage upon Date of Substantial Completion.

END OF SECTION 09 65 66

SECTION 09 67 00
FLUID-APPLIED FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fluid-applied flooring and base.

1.02 RELATED REQUIREMENTS

A. Section 03 54 00 - Cast Underlayment: Substrate preparation.

B. Section 07 92 00 - Joint Sealants: Sealing joints between fluid-applied flooring and adjacent construction and fixtures.

C. Section 09 05 61 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.

D. Section 22 10 06 - Plumbing Piping Specialties: Recessed plumbing access cover frames.

1.03 REFERENCE STANDARDS

A. ASTM D638 - Standard Test Method for Tensile Properties of Plastics; 2022.

B. ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics; 2023.

C. ASTM D4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser; 2025.

D. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.

E. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

F. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair; 2013.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available.

C. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.

D. Verification Samples: Submit two samples, 6 by 6 inch in size illustrating color and pattern for each resilient flooring product selected.

E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and application rate for each coat.

F. Maintenance Data: Include maintenance procedures, recommended maintenance materials, procedures for stain removal, repairing surface, and suggested schedule for cleaning.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in performing the work of this section.
   1. Minimum three years of experience.

C. Supervisor Qualifications: Trained by product manufacturer.

1.06 MOCK-UPS

A. Construct mock-up(s) of fluid applied flooring to serve as basis for evaluation of texture and workmanship.
   1. Number of Mock-Ups to be Prepared: One.

2. Use same materials and methods for use in the work.
3. Use approved design samples as basis for mock-ups.
4. Locate where directed.
5. Minimum Size: 48 inches by 48 inches.

B. See Section 01 40 00 - Quality Requirements for additional requirements.

C. Obtain approval of mock-up by Architect before proceeding with work.

D. Approved mock-up may remain as part of the work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Store resin materials in a dry, secure area.

B. Store materials for three days prior to installation in area of installation to achieve temperature stability.

1.08 FIELD CONDITIONS

A. Maintain minimum temperature in storage area of 55 degrees F.

B. Store materials in area of installation for minimum period of 24 hours prior to installation.

C. Maintain ambient temperature required by manufacturer 72 hours prior to, during, and 24 hours after installation of materials.

D. Substrate temperature must be minimum of 5 degrees above dew point prior to, during or up to 24 hours after application of flooring system.

E. Maintain a minimum of 30 footcandles when measured 3 feet from surface.

F. Advise other trades of fixtures and fittings not to be installed until flooring is cured and protected.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fluid-Applied Flooring:
1. Basis of Design - Quartz Blend:
   a. Sherwin-Williams Company: General Polymers Brand;; Resuflor Aqua Deco Quartz DB: www.generalpolymers.com/#sle.
2. Other Acceptable Manufacturers:
   a. Manufacturer's other than the basis of design must exactly match the color, texture, pattern, etc. of the basis of design product.
   b. Sika Corporation: www.sikafloorusa.com/#sle.
   c. Dex-o-Tex: www.dex-o-tex.com
   d. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 FLUID-APPLIED FLOORING SYSTEMS

A. Fluid-Applied Flooring: Epoxy base coat(s), with broadcast aggregate.
1. Aggregate: Quartz granules.
2. Top Coat: Polyurethane. Architect of Record to determine top coat quantity from mock-up (minimum 3 top coats).
3. System Thickness: 1/8 inch, nominal, dry film thickness (DFT).
4. Texture: Orange peel.
5. Sheen: High gloss.
6. Color: As selected by Architect.
7. Provide integral 4" high base.

2.03 ACCESSORIES

A. Base Caps: Zinc with projecting base of 1/8 inch; color as selected.

B. Cant Strips: Molded of flooring resin material.

C. Subfloor Filler: Type recommended by fluid-applied flooring manufacturer.

D. Primer: Type recommended by fluid-applied flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive flooring.

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 flooring.

C. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of materials to subfloor surfaces.

D. Verify that concrete sub-floor surfaces are ready for flooring installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by flooring materials manufacturer.

E. Verify that required floor-mounted utilities are in correct location.

F. Provide adequate ventilation and fire protection at all mixing and placing operations. Prohibit smoking or use of spark or flame producing devices within 50 feet of any mixing or placing operation.

3.02 PREPARATION

A. Remove subfloor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.

B. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Grind irregularities above the surface level. Prohibit traffic until filler is cured.

C. Vacuum clean substrate.

D. Apply primer to surfaces required by flooring manufacturer.

3.03 INSTALLATION - ACCESSORIES

A. Install cant strips at base of walls where flooring is to be extended up wall as base.

B. Install terminating cap strip at top of base; attach securely to wall substrate.

3.04 INSTALLATION - FLOORING

A. Apply in accordance with manufacturer's instructions.

B. Apply each coat to minimum thickness required by manufacturer.

C. Finish to smooth level surface.

D. Install flooring in recessed type floor access covers.

E. Cove at vertical surfaces.

3.05 PROTECTION

A. Prohibit traffic on floor finish for 48 hours after installation.

B. Barricade area to protect flooring until fully cured.

END OF SECTION 09 67 00

SECTION 09 68 13
TILE CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Carpet tile, fully adhered.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied flooring.

B. Section 03 54 00 - Cast Underlayment.

C. Section 09 05 61 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.

1.03 REFERENCE STANDARDS

A. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials; 2016 (Reapproved 2021).

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. CRI 104 - Standard for Installation of Commercial Carpet; 2015.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.

C. Shop Drawings: Indicate layout of joints, direction of carpet pile, and location of edge moldings.

D. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.

E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

F. Operation and Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum three years documented experience.

B. Installer Qualifications: Company specializing in installing carpet tile with minimum three years documented experience and approved by carpet tile manufacturer.

1.06 FIELD CONDITIONS

A. Store materials in area of installation for minimum period of 24 hours prior to installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Tile Carpeting:
   1. Interface, Inc: www.interfaceinc.com.

2. Milliken & Company; ____: www.milliken.com/#sle.
3. As indicated on drawings.
4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 MATERIALS

A. Carpet Tile
1. Refer to drawings and finish schedule for basis of design manufactures, style, color, and size.

2.03 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by flooring material manufacturer.

B. Edge Strips: Rubber, color as selected by Architect.

C. Carpet Tile Adhesive: Recommended by carpet tile manufacturer; releasable type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.

B. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to subfloor surfaces.

C. Cementitious Subfloor Surfaces: Verify that substrates are ready for flooring installation by testing for moisture and alkalinity (pH).
1. 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 subfloor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with subfloor filler.

C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.

D. Vacuum clean substrate.

3.03 INSTALLATION

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install carpet tile in accordance with manufacturer's instructions.

C. Blend carpet from different cartons to ensure minimal variation in color match.

D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.

E. Lay carpet tile in square pattern, with pile direction parallel to next unit, set parallel to building lines.

F. Locate change of color or pattern between rooms under door centerline.

G. Trim carpet tile neatly at walls and around interruptions.

H. Complete installation of edge strips, concealing exposed edges.

3.04 CLEANING

A. Remove excess adhesive without damage, from floor, base, and wall surfaces.

B. Clean and vacuum carpet surfaces.

END OF SECTION 09 68 13

SECTION 09 72 13
CUSTOM PRINTED WALL COVERINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparationand prime painting.

B. Custom printed wall covering- artwork provided by Architect.

1.02 RELATED REQUIREMENTS

A. Section 09 21 16 - Gypsum Board Assemblies: Preparation of wall surfaces.

B. Section 09 91 23 - Interior Painting: Preparationand priming of substrate surfaces.

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; 2024.

C. ASTM F793/F793M - Standard Classification of Wall Coverings by Use Characteristics; 2015.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on wall coveringand adhesive.

C. Shop Drawings: Indicate wall elevations with seaming layout.

D. Manufacturer's Installation Instructions: Indicate special procedures.

E. Maintenance Data: Submit data on cleaning, touch-up, and repair of covered surfaces.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years ofdocumented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years ofdocumented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Inspect roll materials at arrival on site, to verify acceptability.

B. Protect packaged adhesive from temperature cyclingand cold temperatures.

C. Do not store roll goods on end.

1.07 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.

C. Provide lighting level of 80 ft candles measured mid-height at substrate surfaces during installation.

PART 2 PRODUCTS

2.01 WALL COVERINGS

A. General Requirements:
   1. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84.

2. Chemical and Stain Resistance: No visible staining or discoloration and no damage to surface texture when tested in accordance with ASTM D1308.
3. Mold, Mildew, and Bacteria Resistance: No growth when tested in accordance with ASTM G21.
4. Toxicity: Cadmium and lead free formulation.

B. Wall Covering Fabric: Comply with the following:
1. Basis of Design:
a. Wolf Gordon Digitial Lab Arcadia and Custom: www.wolfgordon.com
2. Other Manufacturers:
a. MDC Wallcoverings; Product Dreamscape Smooth Matte, Suede, Artist Canvas: www.mdcwall.com.
b. Substitutions: See Section 01 60 00 - Product Requirements.
3. Fabric: Woven, poly/cotton osnaburg
4. Surface Texture: Smooth.
5. Total Thickness: 0.017 to 0.027 mil, depending on texture.
6. Vinyl Weight: 20 oz/linear yd (13 oz/sq yd).
7. Vinyl Weight: 17 oz/linear yd.
8. Fabric Weight: 3 oz/linear yd.
9. Roll Width: 60 inches.
10. Print Width: 54 inches.
11. Breaking Strength (lbs force):
a. Machine Direction: Exceeds Type II minimum of 50 lbs.
b. CrossMachine Direction: Exceeds Type II minimum of 55 lbs.
12. Tearing Strength (scale):
a. Machine Direction: Exceeds Type II minimum of 25lbs.
b. CrossMachine Direction: Exceeds Type II minimum of 25 lbs.
13. Cold Crack Resistance: No change at 20 degrees F.
14. Heat Aging: Does not become stiff, brittle, discolored, or show loss of grain when tested for seven days at 158 degrees F.

C. Adhesive: Type recommended by wall covering manufacturer to suit application to substrate.

D. Substrate Filler: As recommended by adhesive and wall covering manufacturers; compatible with substrate.

1. Where wall covering is called to be installed at CMU wall locations, manufacturer to provide recommended wall preparation and wall liner to ensure smooth substrate for final vinyl wall covering installation.

E. Substrate Primer and Sealer: Alkyd enamel type, white-pigmented, mold inhibiting.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that gypsum board substrate surfaces are finished to level 5.

B. Verify that substrate surfaces are clean, smooth, undamaged, free of mold, mildew, grease or stains.

C. Verify that substrate surfaces areprime painted and ready to receive work, and comply with requirements of wall covering manufacturer.

D. 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.

E. 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.

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: Removeor 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.

H. Before cutting, lay out panels in numeric order and examine goods to make certain no damage has occurred during shipping. Each panel should be inspected for color consistency, accuracy and proper mural dimension. Inspection and installation should be done under adequate/permanent lighting that represents the final lighting conditions as closely as possible.

3.03 INSTALLATION

A. Apply adhesive to wall surface immediately prior to application of wall covering.

B. Use wall covering in roll number sequence provided by the printer/manufacturer.

C. Razor trim edges on flat work table. Do not razor cut on gypsum board surfaces.
   1. Trim the sides of each panel to the printed image edge being careful not to cut into the image. This allows for an enhanced visual guide that will result in a more accurate pattern match.

D. Apply adhesive and wall covering in accordance with manufacturer's instructions for wet or dry hanging technique.
   1. Dry Hanging Technique: Apply adhesive to wall using 1/4 inch to 3/8 inch nap roller.
   2. Wet Hanging Technique: Apply adhesive to wall using 3/8 inch to 1/2 inch nap roller.
   3. Smooth panels into adhesive after approximately 10 minutes allowing adhesive time to tack up.

E. Hang the first panel to a vertical plumb line. Overlap subsequent panels being certain to match all design elements along the entire seam. Double cut matched seams on the wall.

F. Apply wall covering smooth, without wrinkles, gaps or overlaps. Eliminate air pockets and ensure full bond to substrate surface.

G. Butt edges tightly.

H. Overlap adjacent panels as recommended by manufacturer.

I. Do not seam within 2 inches of internal corners or within 6 inches of external corners.

J. Apply wall covering to electrical wall plates prior to replacing.

K. 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.

L. 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 wall covering areas.

B. Replace damaged, installed materials until Date of Substantial Competion.

END OF SECTION 09 72 13

SECTION 09 84 00
DECORATIVE ACOUSTICAL WALL PANELS

PART 1–GENERAL

1.01 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; 2024.

C. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

D. CARB (ATCM) - Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products; Current Edition.

1.02 RELATED DOCUMENTS

A. General conditions and shop drawings of Contract, including General and Supplementary Conditions including Division-1 sections should they apply to the work of this section.

1.03 SUMMARY

A. Section Includes:
   1. Wall panels, unfinished or prefinished decorative acoustical wall panels, and components.

B. Related Sections:
   1. EPA TSCA Title VI or California Air Resources Board (CARB) ATCM
   2. Division 26 (16) Sections – Electrical Work
   3. Substitutions
   4. Submittals which do not provide adequate product information required in the specification will not be considered. The proposed substitution shall meet all requirements of this section to be considered.
      a. REFERENCES
         1) Test Methods:
   5. ASTM C423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
   6. ASTM E90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
   7. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.
   8. ASTMD6007 Standard Test Method for Determining Formaldehyde Concentrations in Air from Wood Products using a Small-Scale Chamber.
      a. SUBMITTALS
         1) Product Data: Submit manufacturer’s data for each type of wall panel required.
         2) Samples: For each specified wall panel, submit 6-inch by 6-inch samples of panels.
         3) Certifications: Submit copies of independent third-party certifications which meet specified requirements and related certified independent laboratory reports showing compliance with specified tests and standards.
         4) Shop Drawings: Submit shop drawings indicating wall panel layout, required trim, and seam locations for this project.
      b. QUALITY ASSURANCE
         1) Manufacturer Qualifications: Minimum 10 years of experience in producing bamboo wall panel products.

2) Emissions Levels: Where indicated in Division 1 and, or Part 2, Products, quality assurance includes a copy of the laboratory report verifying the product meets or surpasses ULEF (ultra low emitting formaldehyde) standards under CARB II.
3) Applicable LEED™ Credits:
(a) 1.Low-Emitting Materials - Formaldehyde emissions evaluation
(1) Product meets one of the following: EPA TSCA Title VI or California Air Resources Board (CARB) ATCM for formaldehyde requirements for ultra-low-emitting formaldehyde (ULEF) resins or EPA TSCA Title VI or CARB (ATCM) formaldehyde requirements for no added formaldehyde resins (NAF).
(b) 2.Building product disclosure and optimization - sourcing of raw materials Bio-based materials.
(1) Bio-based products must meet the Sustainable Agriculture Network's Sustainable Agriculture Standard. Bio-based raw materials must be tested using ASTM Test Method D6866 and be legally harvested, as defined by the exporting and receiving country. Exclude hide products, such as leather and other animal skin material. Products meeting bio-based materials criteria are valued at 100% of their cost for the purposes of credit achievement calculation. (FSC 100% certified)

c. DELIVERY, STORAGE AND HANDLING
1) Wall panels are to be delivered to the project site in original, unopened packages and must be protected from moisture, direct sunlight, and damage.
2) Storage temperatures should not be different from normal conditions of an occupied space, between 50 degrees Fahrenheit and 80 degrees Fahrenheit, with relative humidity between 30 - 50 percent.
3) C. Before installing wall panels, allow to achieve room temperature of the conditioned environment.
(a) 1.7 WARRANTY
4) Submit a written warranty from the manufacturer available at: https://www.plyboo.com/wp-content/uploads/2021/03/20210311_SF_RLS-Warranty.pdf
(a) 1.8 MAINTENANCE
(1) A. Extra Materials:
5) 1. Wall Panels: Furnish extra quantity of units equal to 5.0 percent of amount installed.

PART 2 - PRODUCTS

2.01 2.1 MANUFACTURERS

a. Wall Panels:

B. Manufacturer: Smith & Fong Company
1. 394 Bel Marin Keys, Suite 6, Novato, CA 94949
2. Website: www.plyboo.com
(a) 2.2 WALL PANELS
2) Wall Panels: Type AWP-1:
3) Material: 100% Bamboo (FSC 100% Certified)
4) Surface Texture: Smooth
5) Surface Type: Species: Moso bamboo (Phyllostachys Pubescens)
6) Base/Core Composition: REALCORE™; Species: Moso bamboo (Phyllostachys Pubescens)
7) Sound Absorption: QuietWall™ Technology
8) Flexibility: 24" radius max.
9) Color: (Amber) or (Natural) or (Fog) or (Storm) or (Mist) or (Noir)
10) Patterns: (LH-51) (LH-52) (LH-53) (LH-55) (LH-56) (LH-57)
11) Standards/Certifications: (CARB ULEF) (ULEF/FSC 100%)

12) Thickness: 1/2-inch (12mm)
13) Width:47-1/2 inches
14) Panel Heights:95-1/2 inches
15) Edge Profile: Straight edge
16) ASTM Procedure C 423---09a, Standard Test Method For Sound Absorption And Sound Absorption: avg. 0.70
17) Sound Transmission Class (STC): ASTM E 795A: Rating 0.00
18) 43 – Wall Panel on one side of 5/8" drywall on 3-5/8" metal studs
19) 46 – Wall Panel on two sides of 5/8" drywall on 3-5/8" metal studs
20) 52 - Wall Panel on one side of 5/8" drywall on 3-5/8" metal studs with R-11 fiberglass insulation in cavity
21) Flame Spread: ASTM E84; Class C (Class B available).
22) Emission Testing: ASTM D6007: 0.04ppm – Ultra Low Emitting Formaldehyde
23) Dimensional Stability: Standard – space must be enclosed with HVAC systems operating and with appropriate humidity levels maintained between 30%RH-50%RH at all times.
24) Acceptable Product: The Living Hinge Collection, as manufactured by Smith & Fong Company.

PART 3 - EXECUTION

3.01 3.1 EXAMINATION

(1) A. All wet work such as concrete, terrazzo, plastering and painting must be completed and thoroughly dried out before installing the product specified, unless expressly permitted by manufacturer's printed recommendations.

(b) 3.2 PREPARATION

(1) A. Measure the wall area(s) and establish layout of wall panel units per shop drawings and to ensure border widths are balanced at opposite edges. Coordinate panel layout with mechanical and electrical fixtures.

3.02 3.3 INSTALLATION

(1) Install wall panels by attaching the panels to an existing wall per the manufacturer's instructions and in accordance with the authorities having jurisdiction.

(2) Install panels using a standard Z-clip system.

3.03 3.4 ADJUSTING AND CLEANING

(1) Replace damaged and broken panels.

(2) Perform routine maintenance involving frequent vacuuming to mitigate dirt accumulation. When needed, clean with a damp (not wet) cloth.

END OF SECTION 09 84 00

SECTION 09 84 11
WALL-MOUNTED ACOUSTIC PANELS

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section including the following.
   1. Wall-mounted acoustic panels.

B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
   1. Section 061000 - Rough Carpentry; concealed blocking and supports.

1.02 SUBMITTALS

A. Product Data: Submit for each product indicating materials, dimensions, profiles, textures and colors. Include installation instructions.

B. Shop Drawings: Submit shop drawings indicating plans, elevations, details of construction, and relationship with adjacent construction.

C. Verification Samples: Submit representative sample of felt in color specified.

1.03 QUALITY ASSURANCE

A. Manufacturer: Minimum of 2 years manufacturing similar products.

B. Installer: Minimum of 2 years installing similar products.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact.

B. Storage and Handling: Comply with manufacturer's recommendations for storage and handling. Protect from weather damage.

1.05 WARRANTY

A. Warranty: Provide manufacturer's standard limited warranty against defects in manufacturing.

PART 2 PRODUCTS

2.01 WALL-MOUNTED ACOUSTIC PANELS

A. Basis-of-Design: Muro Plus by FilzFelt, www.filzfelt.com/muro-plus; 100% Wool Design Felt.
   1. Materials:
      a. Felt: 100% Wool Design Felt, 100 percent biodegradable.
      b. Substrate: Akustika 10, 100 percent recyclable.
      c. Contains no formaldehyde, chemical irritants, or harmful substances.
      d. VOC free.
   2. Panel Thickness: 1 inch.
   3. Panel Thickness: 2 inch.
   4. Panel Thickness: 3 inch.
   5. Panel Size: As indicated on drawings
   6. Color: As selected from manufacturer's standard colors.
   7. Mounting Method: Preinstalled Z-Clips.
   8. Properties:
      a. NRC (((ASTM C423))): 0.90.
      b. SAA (((ASTM C423))): 0.92.
      c. Colorfastness to Light Class: 4–5 (40 hours).
      d. Colorfastness to Crocking: Class 3–4 (wet), Class 4–5 (dry).

e. Environmental: Oeko-Tex Standard 100 Certified Product Class II (100% Wool Design Felt), Meets VOC test limits for the CDPH v1.2 method (100% Wool Design Felt).

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine existing conditions to determine that they are suitable for installation. Proceed with installation only when unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Clean substrates of projections and substances detrimental to application.

B. Install units in accordance with manufacturer's instructions, approved submittals, and in proper relationship to adjacent construction.

3.03 ADJUSTING AND CLEANING

A. Adjust units for proper position, uniform appearance and operation.

B. Clean exposed and semi-exposed surfaces using materials acceptable to manufacturer.

END OF SECTION 09 84 11

SECTION 09 84 30
SOUND-ABSORBING WALL AND CEILING UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sound-absorbing panels.

B. Mounting accessories.

1.02 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; 2024.

C. ASTM E795 - Standard Practices for Mounting Test Specimens During Sound Absorption Tests; 2016.

1.03 SUBMITTALS

A. Product Data: Manufacturer's printed data sheets for products specified.

B. Shop Drawings: Fabrication and installation details, panel layout, fabric orientation, and wood grain orientation.

C. Selection Samples: Manufacturer's color charts for fabric covering, indicating full range of fabrics, colors, and patterns available.

D. Verification Samples: Fabricated samples of each type of panel specified; 12 by 12 inch, showing construction, edge details, and fabric covering.

E. Test Reports: Certified test data from an independent test agency verifying that panels meet specified requirements for acoustical and fire performance.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with at least three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

1.06 MOCK-UPS

1. Mock-up may remain as part of work.

PART 2 PRODUCTS

2.01 FABRIC-COVERED SOUND-ABSORBING UNITS

A. Manufacturers:
   1. Carnegie Xorel Artform Panels with substrate (Quiet Core or Quiet Core Plus), sizes, shapes and fabrics as indicated on drawings.
   2. Kinetics, TAD Panels, custom sizes and shapes as indicated on the drawings.
   3. Substitutions: See Section 01 60 00 - Product Requirements.

B. Sound Absorbing Units: 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.

C. Fabric-Covered Acoustical Panels for Walls:
   1. Panel Core: Manufacturer's standard rigid or semi-rigid fiberglass core.
      a. Facing: 1/16 inch impact-resistant and tackable surface laminated to core.
   2. Noise Reduction Coefficient (NRC): 0.80 when tested in accordance with ASTM C423 for Type 1 mounting, per ASTM E795.
   3. Panel Size: As indicated on Drawings.
   4. Panel Thickness: As indicated as drawings.

5. Corners: Square.
6. Fabric: As indicated on drawings. .
7. Color: As selected by Architect from manufacturer's full range as indicated on the drawings.
8. Mounting Method: Back-mounted in accordance with manufacturer's recommendations.

2.02 WOOD FIBER SOUND-ABSORBING UNITS

A. Manufacturers:
   1. Armstrong World Industries, Inc; _____: www.armstrongceilings.com/#sle.
   2. Substitutions: See Section 01 60 00 - Product Requirements.

B. Wood Fiber Acoustical Panels for Walls and Ceilings: Cementitious wood fiber.
   1. Size: 24 by 96 inches.
   2. To be field cut per shape and size indicated on drawings.
   3. Thickness: 2 inches.
   4. Noise Reduction Coefficient (NRC): 0.70 to 0.80 when tested in accordance with ASTM C423 for Type A mounting, per ASTM E795.
   5. Panel Edge: Square.
   6. Surface Pattern: Coarse.
   7. Surface Color: To be field painted, color as indicated on drawings.
   8. Mounting: Use fixing clips to attach to metal hat channels anchored to wall substrate.

2.03 FABRICATION

A. Fabric Wrapped, General: Fabricate panels to sizes and configurations as indicated, with fabric facing installed without sagging, wrinkles, blisters, or visible seams.

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.

2.04 ACCESSORIES

A. Back-Mounting Accessories: Manufacturer's standard accessories for concealed support, designed to allow panel removal, and as follows:
   1. Two-part clip and base-support bracket system; brackets designed to support full weight of panels and clips designed for lateral support, with one part mechanically attached to back of panel and the other attached to substrate.

B. Ceiling-Suspended Accessories: Manufacturer's standard accessories at locations as indicated on each acoustical unit, sized appropriately for weight of acoustical unit.

C. Fixing Clips: Manufacturers standard for application as indicated.

D. Furring Strips: Metal hat channel.

PART 3 EXECUTION

3.01 EXAMINATION

3.02 INSTALLATION

A. Align panels accurately, with edges plumb and top edges level. Scribe to fit accurately at adjoining work and penetrations.

B. Suspend ceiling baffles at locations and heights as indicated.

C. Furring Mounted Wood Veneer Panels:
   1. Install furring strip along meeting edges of adjacent panels to ensure they are attached to same furring strip along abutted edge; 24 inch on center, maximum.
   2. Install acoustic back-up material between furring as required for application.
   3. Adhere first panel from edge to furring strip, and attach subsequent panels using fixing clips.

D. Furring-Mounted Cementitious Wood Fiber Panels:

1. Install furring strip along meeting edges of adjacent panels to ensure they are attached to same furring strip along abutted edge; 24 inches on center, maximum.
2. Install acoustic insulation between furring as indicated on drawings.
3. Adhere first panel from edge to furring strip; attach subsequent panels using fasteners.

E. Install acoustical units to construction tolerances of plus or minus 1/16 inch for the following:
1. Plumb and level or as indicate.
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.

3.04 PROTECTION

END OF SECTION 09 84 30

SECTION 09 91 13
EXTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
   1. Exposed surfaces of steel lintels and ledge angles.
   2. Mechanical and Electrical:
      a. On the roof and outdoors, paint equipment exposed to weather or to view, including factory-finished materials.

D. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Non-metallic roofing and flashing.
   6. Stainless steel, anodized aluminum, bronze, terne-coated stainless steel, zinc, and lead.
   7. Marble, granite, slate, and other natural stones.
   8. Floors, unless specifically indicated.
   9. Ceramic and other types of tiles.
   10. Brick, glass unit masonry, architectural concrete, cast stone, integrally colored plaster and stucco.
   11. Glass.
   12. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

A. Section 09 91 23 - Interior Painting.

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 D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2024.

C. ASTM D4258 - Standard Practice for Surface Cleaning Concrete for Coating; 2023.

D. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; current edition, www.paintinfo.com.

E. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

F. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).

G. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide complete list of products to be used, with the following information for each:

1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
2. MPI product number (e.g. MPI #47).
3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
4. Manufacturer's installation instructions.
5. If proposal of substitutions is allowed under submittal procedures, explanation of substitutions proposed.

C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
1. Where sheen is specified, submit samples in only that sheen.
2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens not required.
3. Allow 30 days for approval process, after receipt of complete samples by Architect.
4. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as masonry, have been approved.

D. Samples: Submit two paper chip samples, 8 x 8 inch in size illustrating range of colors available for each surface finishing product scheduled.

E. Certification: By manufacturer that paints and finishes comply with VOC limits specified.

F. Manufacturer's Instructions: Indicate special surface preparation procedures and substrate conditions requiring special attention.

G. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum five years experience and approved by manufacturer.

1.06 MOCK-UPS

A. See Section 01 40 00 - Quality Requirements, for general requirements for mock-up.

B. Provide panel, 6 feet long by 6 feet wide, illustrating paint color, texture, and finish.
1. Provide five separate paint colors for mockups.

C. Provide door and frame assembly illustrating paint color, texture, and finish.

D. Locate where directed by Architect.

E. Mock-up may remain as part of the work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.08 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the paint product manufacturer's temperature ranges.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply exterior paint and finishes during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

D. Minimum Application Temperatures for Latex Paints: 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.

B. Paints:
1. PPG Paints: www.ppgpaints.com/#sle.
2. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
3.
4. Valspar Corporation: www.valsparpaint.com/#sle.

C. Primer Sealers: Same manufacturer as top coats.

D. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready-mixed, unless required to be a field-catalyzed paint.
1. Where MPI paint numbers are specified, provide products listed in Master Painters Institute Approved Product List, current edition available at www.paintinfo.com, for specified MPI categories, except as otherwise indicated.
2. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
3. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
4. 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.
5. Supply each paint material in quantity required to complete entire project's work from a single production run.
6. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is described explicitly in manufacturer's product instructions.

B. Flammability: Comply with applicable code for surface burning characteristics.

C. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.

D. Colors: To be selected from manufacturer's full range of available colors.
1. Selection to be made by Architect after award of contract.
2. Allow for minimum of three colors for each system, unless otherwise indicated, without additional cost to Owner.
3. Extend colors to surface edges; colors may change at any edge as directed by Architect.

2.03 PAINT SYSTEMS - EXTERIOR

A. Exterior Surfaces to be Painted, Unless Otherwise Indicated: Including primed metal.
1. Two top coats and one coat primer.
2. Top Coat(s): Exterior Latex.
a. Products:

1) Pittsburgh Paints Speedhide Exterior Latex, 6-900XI Series, Semi-Gloss. (MPI #11)
2) Sherwin Williams Exterior Latex, (MPI#11)
3) Valspar Professional Exterior, No. 12900 Series, Semi-Gloss.
4) Substitutions: Section 01 60 00 - Product Requirements.

3. Top Coat Sheen:
   a. Semi-Gloss: MPI gloss level 5; use this sheen at all locations.
4. Primer: As recommended by top coat manufacturer for specific substrate.

B. Galvanized Metals, Latex, 3 Coat:
1. One coat galvanize primer.
2. Semi-gloss: Two coats of latex enamel.

2.04 PRIMERS

A. Primers: Provide the following unless other primer is required or recommended by manufacturer of top coats.

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

D. Test shop-applied primer for compatibility with subsequent cover materials.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or repair existing paints or finishes that exhibit surface defects.

D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.

E. Seal surfaces that might cause bleed through or staining of topcoat.

F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

G. Galvanized Surfaces:
1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
2. Prepare surface according to SSPC-SP 2.

H. Ferrous Metal:
1. Solvent clean according to SSPC-SP 1.
2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.

3. Remove rust, loose mill scale, and other foreign substances using using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.

I. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

D. Apply each coat to uniform appearance.

E. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply additional coats until complete hide is achieved.

F. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

A. Protect finishes until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION 09 91 13

SECTION 09 91 23
INTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints and stains.

C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
   1. Surfaces inside cabinets.
   2. Prime surfaces to receive wall coverings.
      a. In finished areas, paint shop-primed items.
      b. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.

D. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
   5. Stainless steel, anodized aluminum, bronze, terne-coated stainless steel, and lead items.
   6. Marble, granite, slate, and other natural stones.
   7. Floors, unless specifically indicated.
   8. Ceramic and other tiles.
   9. Glass.
   10. Acoustical materials, unless specifically indicated.
   11. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

A. Section 09 91 13 - Exterior Painting.

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 D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2024.

C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2020 (Reapproved 2025).

D. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; current edition, www.paintinfo.com.

E. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

F. SSPC V1 (PM1) - Good Painting Practice: Painting Manual, Volume 1; Fourth Edition.

G. SSPC V2 (PM2) - Systems and Specifications: Steel Structures Painting Manual, Volume 2; Fourth Edition.

H. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).

I. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).

J. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g., "alkyd enamel").
   2. MPI product number (e.g., MPI #47).
   3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
   4. Manufacturer's installation instructions.
   5. If proposal of substitutions is allowed under submittal procedures, explanation of substitutions proposed.

C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.
   2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens not required.
   3. Allow 30 days for approval process, after receipt of complete samples by Architect.
   4. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as masonry, have been approved.

D. Samples: Submit two paper chip samples, 8 x8 inch in size illustrating range of colors available for each surface finishing product scheduled.

E. Certification: By manufacturer that paints and finishes comply with VOC limits specified.

F. Manufacturer's Instructions: Indicate special surface preparation procedures and substrate conditions requiring special attention.

G. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Paint and Finish Materials: 1 gallon of each color; from the same product run, store where directed.
   3. Label each container with color in addition to the manufacturer's label.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum five years experience and approved by manufacturer.

1.06 MOCK-UP

A. See Section 01 40 00 - Quality Requirements, for general requirements for mock-up.

B. Provide panel, 6 feet long by 6 feet wide, illustrating paint color, texture, and finish.
   1. Provide 5 separate color sample mock ups for approval.

C. Provide door and frame assembly illustrating paint color, texture, and finish.

D. Locate where directed by Architect.

E. Mock-up may remain as part of the work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.08 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply materials when relative humidity exceeds 85 percent, at temperatures less than 5 degrees F above the dew point, or to damp or wet surfaces.

D. Minimum Application Temperatures for Paints: 50 degrees F for interiors unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.

B. Paints:
1. Pittsburgh Paints: www.ppgpaints.com/#sle.
2. Benjamine Moore: www.benjaminmoore.com
3. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
4. Valspar Corporation: www.valsparpaint.com/#sle.

C. Primer Sealers: Same manufacturer as top coats.

D. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready-mixed, unless intended to be a field-catalyzed paint.
1. Where MPI paint numbers are specified, provide products listed in Master Painters Institute Approved Product List, current edition available at www.paintinfo.com, for specified MPI categories, except as otherwise indicated.
2. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
3. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
4. 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.
5. Supply each paint material in quantity required to complete entire project's work from a single production run.
6. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

B. Flammability: Comply with applicable code for surface burning characteristics.

C. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.

D. Colors: To be selected from manufacturer's full range of available colors.

1. Allow for minimum of three colors for each system, unless otherwise indicated, without additional cost to Owner.
2. Extend colors to surface edges; colors may change at any edge as directed by Architect.
3. In utility areas, finish equipment, piping, conduit, and exposed duct work in colors according to the color coding scheme indicated.

2.03 PAINT SYSTEMS - INTERIOR

A. Interior Surfaces to be Painted, Unless Otherwise Indicated: Including gypsum board, concrete masonry units, uncoated steel, shop primed steel, and galvanized steel.
   1. Two top coats and one coat primer.
   2. Top Coat(s): Institutional Low Odor/VOC Interior Latex; MPI #143, 144, 145, 146, 147, or 148.
      a. Products:
         1) PPG Paints Speedhide zero Latex, 6-4310XI Series, Eggshell. (MPI #144)
         2) Sherwin-Williams ProMar 200 Zero VOC Interior Latex, Eggshell.
         3) Valspar Professional Zero VOC Interior Latex, No. 11800 Series, Eggshell.
         4) Substitutions: Section 01 60 00 - Product Requirements.
   3. Top Coat Sheen:
      a. Eggshell: MPI gloss level 3; use this sheen at all locations.
   4. Primer: As recommended by top coat manufacturer for specific substrate.

B. Medium Duty Door/Trim: For surfaces subject to frequent contact by occupants, including metals:
   1. Medium duty applications include doors, door frames, railings, handrails, guardrails, and balustrades.
   2. Two top coats and one coat primer.
   3. Top Coat(s): Interior Epoxy-Modified Latex; MPI #115 or 215.
      a. Products:
         1) PPG Paints Pitt-Glaze WB Water-Borne Acrylic Epoxy, 16-599 Series, Gloss.
         2) Sherwin-Williams Waterbased Catalyzed Epoxy, Semi-Gloss.
         3) Substitutions: Section 01 60 00 - Product Requirements.
   4. Primer: As recommended by top coat manufacturer for specific substrate.

C. Dry Fall: Metals; exposed structure and overhead-mounted services, including shop primed steel deck, structural steel, metal fabrications, galvanized ducts, galvanized conduit, and galvanized piping.
   1. Shop primer by others.
   2. One top coat _____.
   3. Top Coat: Latex Dry Fall; MPI #118, 155, or 226.
      a. Products:
         1) PPG Paints Speedhide Super Tech Water Based Interior Dry-Fog.
         2) Sherwin-Williams Waterborne Acrylic Dryfall
         3) Valspar Professional Interior Latex Dry Fall, No.275 Series.
         4) Substitutions: Section 01 60 00 - Product Requirements.
   4. Top Coat Sheen:
      a. Eggshell: MPI gloss level 3; use this sheen at all locations.
   5. Primer: As recommended by top coat manufacturer for specific substrate.

D. Paint I-TR -W - Transparent Finish on Wood.
   1. Stain: Semi-Transparent Stain for Wood; MPI #90.
   2. Top Coat(s): Polyurethane Varnish, High Build.

E. Paint I-TR-FL - Transparent Finish on Wood Floors:
   1. Stain: Semi-Transparent Stain for Wood; MPI #90.
   2. Top Coat(s): Polyurethane Varnish, High Build.

F. Ferrous Metals, Unprimed, Latex, 3 Coat:

1. One coat of latex primer.
2. Semi-gloss: Two coats of latex enamel.

G. Ferrous Metals, Primed, Latex, 2 Coat:
1. Touch-up with latex primer.
2. Semi-gloss: Two coats of latex enamel.

H. Galvanized Metals, Latex, 3 Coat:
1. One coat galvanize primer.
2. Semi-gloss: Two coats of latex enamel.

2.04 PRIMERS

A. Primers: Provide the following unless other primer is required or recommended by manufacturer of top coats.
1. Interior/Exterior Latex Block Filler; MPI #4.
a. Products:
1) Kilz Pro-X p50 Block Filler Primer.
2) Pittsburgh Paints Speedhide Masonry Hi Fill Latex Block Filler, 6-15XI . (MPI #4)
3) Sherwin-Williams ConFlex Block Filler. (MPI #4)
2. Bonding Primer, Used on Existing Glazed Block.
a. Products:
1) Basis of Design: Extreme Bond Primer by Sherman Williams.
2) Substitutions: Section 01 60 00 - Product Requirements.

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

D. Test shop-applied primer for compatibility with subsequent cover materials.

E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces is below the following maximums:
1. Gypsum Wallboard: 12 percent.
2. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
3. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

E. Masonry:

1. Remove efflorescence and chalk. Do not coat surfaces if moisture content, alkalinity of surfaces, or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions. Allow to dry.
2. Prepare surface as recommended by top coat manufacturer.
3. Clean surfaces with pressurized water. Use pressure range of 600 to 1,500 psi at 6 to 12 inches. Allow to dry.

F. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.

G. Galvanized Surfaces:
1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
2. Prepare surface according to SSPC-SP 2.

H. Ferrous Metal:
1. Solvent clean according to SSPC-SP 1.
2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
3. Remove rust, loose mill scale, and other foreign substances using using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.

I. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

C. Apply each coat to uniform appearance in thicknesses specified by manufacturer.

D. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

E. Sand wood and metal surfaces lightly between coats to achieve required finish.

F. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

A. Protect finishes until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

3.06 SCHEDULE - PAINT SYSTEMS

A. Concrete, Concrete Masonry Units (CMU), Concrete Block, Brick Masonry: Finish surfaces exposed to view.

B. Gypsum Board: Finish surfaces exposed to view.

C. Steel Doors and Frames: Finish surfaces exposed to view; MI-OP-3A, gloss.

D. Steel Fabrications: Finish surfaces exposed to view.

E. Galvanized Steel: Finish surfaces exposed to view.

F. Shop-Primed Metal Items: Finish surfaces exposed to view.

END OF SECTION 09 91 23

SECTION 10 11 00
VISUAL DISPLAY UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Tackable wall panels.

B. Markerboards and Tackboards.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Blocking and supports.

B. Section 09 21 16 - Gypsum Board Assemblies: Concealed supports in metal stud walls.

1.03 REFERENCE STANDARDS

A. ANSI A135.4 - Basic Hardboard; 2012 (Reaffirmed 2020).

B. ANSI A208.1 - American National Standard for Particleboard; 2022.

C. ASTM A424/A424M - Standard Specification for Steel, Sheet, for Porcelain Enameling; 2025.

D. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2024.

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.

F. ASTM F793/F793M - Standard Classification of Wall Coverings by Use Characteristics; 2015.

G. PS 1 - Structural Plywood; 2023.

1.04 SUBMITTALS

A. See Section 01 30 00 - 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. Samples: Submit color charts for selection of color and texture of markerboard, tackboard, tackboard surface covering, and trim.

E. Test Reports: Show compliance to specified surface burning characteristics requirements.

F. Manufacturer's printed installation instructions.

G. 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 three years documented experience.

1.06 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide five year warranty for chalkboard and markerboard to include warranty against discoloration due to cleaning, crazing or cracking, and staining.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Visual Display Boards:
   1. Claridge Products and Equipment, Inc: www.claridgeproducts.com.
   2. MooreCo, Inc: www.moorecoinc.com.
   3. Polyvision Corporation (Nelson Adams): www.polyvision.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 VISUAL DISPLAY UNITS

A. Porcelain Enamel Steel Markerboards:
   1. Color: White.
   2. Height: 48 inches.
   3. Length: As indicated on drawings.
   4. Frame: Extruded aluminum , with concealed fasteners.
   5. Frame Finish: Baked enamel, color to match board.
   6. Accessories: Provide chalk tray and map rail.
   7. All markerboards shall be magnetic.

B. Tackboards: Fabric laminated to fiberboard.
   1. Fabric: Vinyl-coated fabric.
   2. Color: As selected from manufacturer's full range.
   3. Backing: Hardboard, 1/4 inch thick, laminated to tack surface.
   4. Surface Burning Characteristics: Flame spread index of 25, maximum, and smoke developed index of 450, maximum, when tested in accordance with ASTM E84.
   5. Height: 48 inches.
   6. Length: As indicated on drawings.
   7. Frame: Extruded aluminum, with concealed fasteners.
   8. Frame Profile: Manufacturer's standard.
   9. Frame Finish: Anodized, natural.

C. Tackable Wall Panels: Framed Pinboard Linoleum; Factory-fabricated.
   1. Manufacturers:
      a. Forbo Flooring Systems: www.forbo.com
      b. Substitutions: See Section 01 60 00 - Product Requirements.
   2. Color, Pattern, and Texture: As indicated on drawings.
   3. Surface Burning Characteristics: Flame spread index of 25, maximum, and smoke developed index of 450, maximum, when tested in accordance with ASTM E84.
   4. Size: As indicated on drawings.
   5. Edge Molding: Provide aluminum "J-mold" type edge trim for exposed edges.
   6. Adhesives: Provide manufacturer's recommended adhesive, primer, and sealer, produced for use on substrate shown on drawings. Provide materials which are mildew-resistant and non staining to wallcovering.
   7. Provide backer board at all locaitons.

2.03 MATERIALS

A. Vinyl-Coated Fabric: ASTM F793 Category VI.

B. 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. Temporary Protective Cover: Sheet polyethylene, 8 mil thick.

C. Flag Holders: Cast aluminum bored to receive 1 inch diameter flag staff, bracketed to fit top rail of board.

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 indicated on shop drawings.

C. Verify flat wall surface for frameless adhesive-applied boards.

3.02 PREPARATION

A. Acclimatize tackable wall panels by removing from packaging in installation area not less than 24 hours before application.

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 boards in accordance with manufacturer's instructions.

B. Secure units level and plumb.

C. 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 10 11 00

SECTION 10 12 00
DISPLAY CASES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Recessed display cases.

1.02 RELATED REQUIREMENTS

A. Section 04 72 00 - Cast Stone Masonry

B. Section 06 10 00 - Rough Carpentry: Blocking and supports.

C. Section 09 21 16 - Gypsum Board Assemblies: Concealed supports in metal stud walls.

D. Section 09 22 16 - Non-Structural Metal Framing: Concealed supports in metal stud walls.

1.03 REFERENCE STANDARDS

A. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.

B. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

C. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

D. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2025.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit complete printed data and installation details indicating products to be provided as specified.

C. Shop Drawings: Submit complete installation details. Include dimensioned elevations.

D. Samples: Submit samples of material and trim to illustrate finish, color, and texture.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least three years of documented experience.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver display cases and materials to the Project site with manufacturer’s protective crate covering and do not open until ready for use.

B. Protect display cases before, during, and after installation. In case of damage, immediately provide necessary repairs and replacements.

1.07 FIELD CONDITIONS

A. Field Measurements: Verify field measurements for recessed application for display cases before preparation of shop drawings and before fabrication to ensure proper installation.

1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide five year manufacturer warranty against defects and in materials, finish product and workmanship.

PART 2 PRODUCTS

2.01 DISPLAY CASES

A. Manufacturers:

1. Claridge Products and Equipment, Inc; ____: www.claridgeproducts.com/#sle.
2. MooreCo, Inc; ____: www.moorecoinc.com/#sle.
3. Nelson Adams NACO: https://nelsonadamsnaco.com/#sle.
4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Recessed Display Case: Factory-fabricated display case with adjustable glass shelves, finished interior, and aluminum trim on face to cover edge of recessed opening.

2.02 COMPONENTS

A. Glazed Hinged Doors:
1. 1/4 inch clear tempered glass framed with 1/2 inch by 1 inch extruded aluminum trim.
2. Hinges: 1 inch by .040 inch nickel-plated steel-continuous piano hinges.
3. Lock: Glass door cylinder lock.

B. Glass Shelves:
1. 1/4 inch clear tempered glass with flat-polished edges.
2. Shelf Depth: As indicated on drawings.
3. Shelves per Unit: As indicated on drawings.

C. Cable Display Systems: Sizes and configurations indicated on drawings.
1. Manufacturers:
a. Arakawa Hanging Systems; ____: www.arakawagrip.com/#sle.
b. AS Hanging Display Systems, Inc; ____: www.ashanging.com/#sle.
c. Substitutions: See Section 01 60 00 - Product Requirements.
2. Description:
a. Tensioned cable display system used to support shelving, panels, artwork, and _____ from walls, ceilings, and _____ with the following components:
1) Wire Cable: 7x7 construction.

D. Lighting: Manufacturer's standard LED light fixture housed at top of case with louvered aluminum access door with keyed lock.

2.03 MATERIALS

A. Aluminum Extrusions for Framing and Trim: Alloy as recommended by manufacturer for construction and specified finish; nominal 1/8 inch wall thickness.

B. Aluminum Extrusions: ASTM B221 (ASTM B221M), 6063 alloy, T5 temper.
1. Finish: Factory anodized; AAMA 611: Clear anodized.

C. Heat-Strengthened and Fully Tempered Glass: ASTM C1048, Kind FT.

PART 3 EXECUTION

3.01 PREPARATION

A. Rough openings, electrical pre-wiring, and final finishing are by other trades.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Locate fastening devices to secure cases securely to back and sides of rough opening.

C. Refer to drawings for display case mounting heights.

D. Clean case and glass using manufacturers recommended procedures.

3.03 ADJUSTING AND CLEANING

A. Verify that all accessories are installed as detailed for each unit.

B. At completion of work, clean glass surfaces, back panels and trim in accordance with manufacturer’s recommendations leaving units ready for use.

3.04 CLOSEOUT ACTIVITIES

A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.

END OF SECTION 10 12 00

SECTION 10 14 00
SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Room and door signs.

B. Cast Aluminum Letters.

C. Vinyl wall graphics.

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.

D. ASTM E2072 - Standard Specification for Photoluminescent (Phosphorescent) Safety Markings; 2014.

E. UL 1994 - Luminous Egress Path Marking Systems; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. See Section , 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. 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. When content of signs is indicated to be determined later, request such information from Owner through Architect ; upon request, submit preliminary schedule.
   3. Submit for approval by Owner through Architect prior to fabrication.

D. Samples: Submit two samples, of size similar to that required for project, illustrating sign style, font, and method of attachment.

E. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.

F. Verification Samples: Submit samples showing colors specified.

G. 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 years of experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Package signs as required to prevent damage before installation.

B. Package room and door signs in sequential order of installation, labeled by floor or building.

C. 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.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Flat Signs:
   1. Best Sign Systems, Inc: www.bestsigns.com.
   2. Cosco Industries (ADA signs): www.coscoarchitecturalsigns.com.
   3. Inpro: www.inprocorp.com.
   4. ASI Sign Systems, Inc: www.asi.com
   5. Substitutions:

B. Cast Aluminum Letters:
   1. Cosco Industries: www.coscoarchitecturalsigns.com.
   2. Inpro: www.inprocorp.com.
   3. Gemini Signs and Letters; www.geminisignletters.com.
   4. Substitutions:

2.02 SIGNAGE APPLICATIONS

A. Accessibility Compliance: Signs are required to comply with ADA Standards and 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. Vinyl Door Numbers:
   1. Provide vinyl door numbers on all exterior doors and also address number above main entrance doors.
   2. Size: 10" die cut letters.
   3. Color: As selected by Architect from standard colors.
   4. Mounting: Self adhering to door.
   5. Coordinate numbering with Owner and Fire Department.

C. Vinyl Wall Graphics:
   1. Provide vinyl wall graphics at locations indicate on Drawings.
   2. Size: As indicated on Drawings.
   3. Colors: As required to meet graphic intent. No color or graphic limintations.
   4. Mounting: Self adhering to walls.
   5. Owner to supply art work for wall graphics.

D. 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.
   1. Sign Type: signs with panel media as specified.
   2. Provide "tactile" signage, with letters raised minimum and Grade II braille.
   3. Character Height: 1 inch.
   4. Sign Size: As indicated on the drawings.
   5. Office Doors: Identify with room names and numbers to be determined later, not those indicated on drawings; in addition, provide 'window' with replaceable information panel.
   6. Conference and Meeting Rooms: Identify with room names and numbers to be determined later, not those indicated on drawings.
   7. Service Rooms: Identify with .
   8. Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN", and braille.
   9. Classroom: Provide one sign at all classrooms and resource rooms; in addition, provide "window" section for replaceable information panel.

E. Cast Aluminum Letters
   1. Metal: 1" thick aluminum casting.
   2. Color: As indicated on drawings.
   3. Finish: Brushed, satin.
   4. Size: As indicated on Drawings.
   5. Font: As selected by Architect from full range.

6. Interior Mounting: Post with 1" offset.
7. Exterior Mounting: Post with 1" offset.
8. Illuminuated Back-Lit Letters
    a. Provide products that are listed and labeled as complying with UL 879.
    b. Illuminuated letters located at front canopy. Refer to drawings.
9. Locations: As indicated on drawings.

2.03 ACCESSORIES

A. Concealed Screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.

B. Tape Adhesive: Double sided tape, permanent adhesive.

C. If door to room has glass sidelite in frame, provide back cover plates to hide tape from inside room.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

B. Coordinate sign locations with Owner.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install neatly, with horizontal edges level.

C. Protect from damage until Date of Substantial Completion; repair or replace damaged items.

END OF SECTION 10 14 00

SECTION 10 14 16
PLAQUES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Plaques.

1.02 REFERENCE STANDARDS

1.03 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Package plaque signs as required to prevent damage before installation.

B. Store under cover and elevated above grade.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Plaques:
   1. A.R.K. Ramos: www.arkramos.com/#sle.
   2. FASTSIGNS International, Inc; _____: www.fastsigns.com/#sle.
   3. Takeform: www.takeform.net/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PLAQUES

A. Metal Plaques:
   1. Material: Bronze casting.
   2. Material Thickness: Manufacturer's standard.
   3. Size: 12 inches by 18 inches.
   4. Text and Typeface:
      a. Character Font: Times or other serif font.
      b. Character Case: Upper case only.
      c. Character Color: Contrast with background color.
   5. Border Style: Single line bevel edge.
   6. Background Texture: Pebble.
   7. Surface Finish: Brushed, satin.
   8. Painted Background Color: Light oxide stain.
   9. Protective Coating: Manufacturer's standard clear coating.
   10. Mounting: Rosettes and toggle bolts.

2.03 ACCESSORIES

A. Concealed Screws: Noncorroding metal; stainless steel, galvanized steel, chrome plated, or other.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

B. Notify Architect if conditions are not suitable for installation of signs; do not proceed until conditions are satisfactory.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install with horizontal edges level.

C. Protect from damage until 07-02-2027; repair or replace damaged items.

D. Install at entry vestibule

END OF SECTION 10 14 16

SECTION 10 21 23
CUBICLE CURTAINS AND TRACK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface mounted overhead curtain track and guides.

B. Cubicle curtains.

1.02 RELATED REQUIREMENTS

A. Section 09 51 00 - 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; 2024.

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 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for curtain fabric characteristics and tracks.

C. Product Data: Provide manufacturer's standard catalog pages and data sheets, including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.

D. Shop Drawings: Indicate a reflected ceiling plan view of curtain track, hangers and suspension points, attachment details, schedule of curtain sizes.

E. Selection Samples: Sumbit manufacturer's printed literature identifying all colors/finishes available for inititial color selection.

F. Samples: Submit two fabric samples, 6 by 152.4 inch in size illustrating fabric color.

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 60 00 - Product Requirements, for additional provisions.
   2. Extra Curtains: Two of each type and size.
   3. Extra Carriers: Ten.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least ten years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Accept curtain materials on site and inspect for damage.

B. Handle and store products in accordance with manufacturer's recommendations.

1.07 WARRANTY

A. See Section 01 78 00 - 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. Cubicle Track and Curtains:

1. Construction Specialties, Inc: www.c-sgroup.com/#sle.
2. Imperial Fastener Co., Inc: www.imperialfastener.com/#sle.
3. Inpro: www.inprocorp.com/#sle.
4. Substitutions: See Section 01 60 00 - 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: To fit track section.
   5. Track Bends: Minimum 12 inch radius; fabricated without deformation of track section or impeding movement of carriers.
   6. Finish on Exposed Surfaces: White enamel.
   7. Products:
      a. Construction Specialties, Inc; Narrowline Curtain Tracks: www.c-sgroup.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

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.
   4. Open Mesh Cloth: Open weave to permit air circulation; flameproof material, manufacturer's standard color.
   5. Attachment of Curtain Fabric to Open Mesh Cloth: Manufacturer's standard sewn seam.
   6. Products:
      a. Basis of Design: Impro Clickeze.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

B. Curtain Fabrication:
   1. Width of curtain to be 15 percent wider than track length.
   2. Length of curtain to end 10 inches above finished floor.
   3. Pattern match fabric with vertical seams.
   4. Include open mesh cloth at top 20 inches of curtain for room air circulation, attached to curtain as specified above.
   5. Curtain Heading: Fabric band matching curtain panel with metal grommet holes for carriers spaced 6 inches on center.
   6. Seams and Hems: Manufacturer's standard fabrication method for securely sewn and finished seams and hems.

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. Secure track to ceiling system.

C. Install end cap and stop device.

D. Install curtains on carriers ensuring smooth operation.

END OF SECTION 10 21 23

SECTION 10 22 39
FOLDING PANEL PARTITIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Top-supported folding panel partitions, horizontal opening.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Wood blocking and track support shimming.

1.03 REFERENCE STANDARDS

A. ANSI A208.1 - American National Standard for Particleboard; 2022.

B. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

C. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2024.

D. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2024.

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.

F. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.

G. ASTM E413 - Classification for Rating Sound Insulation; 2022.

H. ASTM E557 - Standard Guide for Architectural Design and Installation Practices for Sound Isolation Between Spaces Separated by Operable Partitions; 2012 (Reapproved 2020).

I. ASTM F793/F793M - Standard Classification of Wall Coverings by Use Characteristics; 2015.

J. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2016.

K. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

L. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on partition materials, operation, hardware and accessories, electric operating components, track switching components, and colors and finishes available.

C. Design Data: Design calculations, bearing seal and signature of structural engineer licensed to practice in the State in which the Project is located, showing loads at points of attachment to the building structure.

D. Shop Drawings: Indicate opening sizes, track layout, details of track and required supports, static and dynamic loads, location and details of pass door and frame, adjacent construction and finish trim, and stacking depth.

E. Samples for Selection: Submit two samples of full manufacturer's color range for selection of colors.

F. Certificates: Certify that partition system meets or exceeds specified acoustic requirements.

G. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods. Describe cleaning materials detrimental to finish surfaces and hardware finish.

1.05 QUALITY ASSURANCE

A. Designer Qualifications: Perform design under direct supervision of Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified this section with minimum three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until installation.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within five 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; 2000 Series Operable Walls: www.kwik-wall.com/#sle.
   2. Moderco, Inc; 800 Series Model 842: www.moderco.com/#sle.
   3. Modernfold, a DORMA Group Company: www.modernfold.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 FOLDING PANEL PARTITIONS - HORIZONTAL OPENING

A. Folding Panel Partitions: Center opening; paired 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, with acoustical insulation fill.
   2. Panel Substrate Facing: Steel sheet, manufacturer's standard thickness.
   3. Panel Properties:
      a. Thickness With Finish: 3 inches.
      b. Width: Standard width.

C. Panel Finishes:
   1. Facing: Acoustical carpet.
   2. Facing: Classroom side: Markerboard.

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; 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. Ceiling Closure: White enameled ceiling closure; aluminum jamb and head molding, fittings and attachments, and intermediate meeting posts.

2. Pocket Enclosures: Door, frame, and trim to match adjacent walls.
3. Acoustic Sealant: As recommended by partition manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that required utilities are available, of the correct characteristics, in proper location, and ready for use.

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 and pocket doors 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.

3.05 CLOSEOUT ACTIVITIES

A. Demonstrate operation of partition and identify potential operational problems.

END OF SECTION 10 22 39

SECTION 10 26 00
WALL AND DOOR PROTECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Corner guards.

B. Protective wall covering.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Blocking for wall and corner guard anchors.

B. Section 09 21 16 - Gypsum Board Assemblies: Placement of supports in stud wall construction.

C. Section 09 22 16 - Non-Structural Metal Framing: Placement of supports in stud wall construction.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2024.

C. ASTM D543 - Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents; 2021.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.

E. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2024.

F. ASTM F476 - Standard Test Methods for Security of Swinging Door Assemblies; 2023.

G. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).

H. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.04 SUBMITTALS

A. See Section 01 30 00 - 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. Show design and spacing of supports for protective corridor handrails, required to withstand structural loads.

D. Samples: Submit samples illustrating component design, configurations, joinery, color and finish.
   1. Submit two sections of corner guards, 24 inches long.
   2. Submit two samples of protective wall covering, 6 by 6 inches square.

E. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project:
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Stock Materials: One package(s) of minimum 96 inches long unit of each kind of covers for corner guards and protective corridor handrails.

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 78 00 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 5-year manufacturer warranty for metal crash rails. Complete forms in Owner's name and register with manufacturer.

C. Installer Warranty: Provide 5-year warranty for metal crash rails commencing on Date of Substantial Completion. Complete forms in Owner's name and register with installer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Corner Guards:
   1. Construction Specialties, Inc; _____: www.c-sgroup.com/#sle.
   2. Inpro: www.inprocorp.com/#sle.
   3. Substitutions: See Section 01 60 00 - Product Requirements.

B. Protective Wall Covering:
   1. Construction Specialties, Inc; Acrovyn High-Impact Wall Covering: www.c-sgroup.com/#sle.
   2. Inpro; _____: www.inprocorp.com/#sle.
   3. Substitutions: See Section 01 60 00 - 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.

C. Fungal Resistance: Unless otherwise noted, provide protection products and assemblies which pass ASTM G21 testing.

2.03 PRODUCT TYPES

A. Corner Guards - Flush Mounted:
   1. Material: High impact vinyl with full height extruded aluminum retainer.
   2. Performance: Resist lateral impact force of 100 lbs at any point without damage or permanent set.
   3. Fire Resistance: Where fire rating is specified for the wall in which the guard is mounted, provide assemblies that have been tested in accordance with ASTM E119 for the same rating as the wall.
   4. 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.
   5. Width of Wings: 2 inches.

6. Corner: Square.
7. Color: As selected from manufacturer's standard colors.
   a. Color of corner guard will match adjacent wall color. Refer to drawings.
8. Length: One piece.

B. Protective Wall Covering:
1. Material: High-impact acrylic-modified vinyl.
   a. Basis of Design: Impro Palladium Rigid Sheet
2. Thickness: 0.040 inch.
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. Color: As selected from manufacturer's standard colors.

2.04 FABRICATION

A. Fabricate components with tight joints, corners and seams.

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.
1. Test painted or wall covering surfaces for adhesion in inconspicuous area, as recommended by manufacturer. Follow adhesive manufacturer's recommendations for remedial measures at locations and/or application conditions where adhesion test's results are unsatisfactory.

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 _____.

C. Position protective wall covering no less than 4 inch above finished floor to allow for floor level variation.
1. Wainscot Installation: Establish a level line at the specified height for entire length of run. Install by aligning top of edge of covering with this line.
2. Apply adhesive with 1/8 inch V-notch trowel to an area of wall surface that can be completed within cure time of the adhesive.
3. Install trim pieces as required for a complete installation. Allow tolerance for thermal movement.
4. At joints indicated to be caulked, allow for a minimum 1/16 inch wide gap between edges of sheets. Gaps are required to be of consistent width throughout the project.
5. Use a roller to ensure maximum contact with adhesive.
6. At inside and outside corners cut covering sheets to facilitate installation of trim pieces or corner guards.

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 10 26 00

SECTION 10 28 00
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. Accessories for toilet rooms, showers, and utility rooms.

E. Utility room accessories.

F. Grab bars.

1.02 RELATED REQUIREMENTS

A. Section 09 30 00 - Tiling: Ceramic washroom accessories.

B. Section 10 21 13 - Solid Phenolic Core Toilet Compartments

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

C. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 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/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.

F. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2017 (Reapproved 2022).

G. ASTM C1036 - Standard Specification for Flat Glass; 2021.

H. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.

I. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2024.

J. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use; 2022.

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.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.

C. Samples: Submit two samples of each accessory, illustrating color and finish.

D. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Commercial Toilet, Shower, and Bath Accessories:
   1. ASI - American Specialties, Inc: www.americanspecialties.com.
   2. Bradley Corporation: www.bradleycorp.com.
   3. Bobrick Washroom Equipment; www.bobrick.com.
   4. Substitutions: Section 01 60 00 - Product Requirements.

2.02 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. Stainless Steel Sheet: ASTM A666/A666M, Type 304.

C. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.

D. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.

E. Mirror Glass: Tempered safety glass, ASTM C1048; and ASTM C1036 Type I, Class 1, Quality Q2, with silvering as required.

F. Adhesive: Two component epoxy type, waterproof.

G. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.

H. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.03 FINISHES

A. Stainless Steel: Satin finish, unless otherwise noted.

2.04 COMMERCIAL TOILET ACCESSORIES

A. Toilet Paper Dispenser: Owner Furnished, Contractor Installed.

B. Paper Towel Dispenser: Owner Furnished, Contractor Installed

C. Waste Receptacles: Owner Furnished, Contractor Installed

D. Soap Dispenser: Owner Furnished, Contractor Installed

E. Mirrors: Stainless steel framed, 1/4 inch thick tempered safety glass; ASTM C1048.
   1. Size: As indicated on Drawings.
   2. Frame: 0.05 inch angle shapes, with mitered and welded and ground corners, and tamperproof hanging system; No.4 finish.
   3. Backing: Full-mirror sized, minimum 0.03 inch galvanized steel sheet and nonabsorptive filler material.
   4. Basis of Design Product: B1658 manufactured by Bobrick..

F. Grab Bars: Stainless steel, smooth surface.
   1. Standard Duty Grab Bars:
      a. Push/Pull Point Load: 250 pound-force, minimum.
      b. Dimensions: 1-1/4 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. Length and Configuration: As indicated on drawings.
      d. Basis of Design Products: B-5806 Series manufactured by Bobrick.

G. Sanitary Napkin Dispenser: Owner Furnished, Contrator Installed

2.05 COMMERCIAL SHOWER AND BATH ACCESSORIES

A. Shower Curtain Rod: 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 installation with exposed fasteners.
   1. Basis of Design Product: B-207 x 60 as manufactured by Bobrick. Coordinate required size in field.

B. Shower Curtain:
   1. Material: Opaque vinyl, 0.008 inch thick, matte finish, with antibacterial treatment, flameproof and stain-resistant.
   2. Size: 48 by 72 inches, hemmed edges.
   3. Grommets: Stainless steel; pierced through top hem on 6 inch centers.
   4. Color: White.
   5. Shower Curtain Hooks: Chrome-plated or stainless steel spring wire designed for snap closure.
   6. Basis of Design Product: 204-3 as manufactured by Bobrick.

C. Folding Shower Seat: Wall-mounted surface; welded tubular seat frame, structural support members, swing-down legs, hinges, and mechanical fasteners of Type 304 stainless steel, L-shaped, right hand seat.
   1. Seat: Phenolic or polymeric composite one-piece seat or seat slats, of color as selected.
   2. Size: ADA Standards compliant.
   3. Basis of Design Product: B-5181 as manufactured by Bobrick.

D. Wall-Mounted Soap Dish: Heavy duty, seamless stainless steel, recessed, without grab bar, satin finish; with concealed mechanical fastening suitable for substrate and backplate.
   1. Basis of Design Product: B-4380 as manufactured by Bobrick.

E. Towel Pin: Stainless steel, 3 inch extension from wall; rectangular-shaped bracket and backplate for concealed attachment, satin finish.
   1. Basis of Design Product: B-677 as manufactured by Bobrick.
   2. Quantity: 3

2.06 UNDER-LAVATORY PIPE AND SUPPLY COVERS

A. Under-Lavatory Pipe and Supply Covers:
   1. Insulate exposed drainage piping, including hot, cold, and tempered water supplies under lavatories or sinks to comply with ADA Standards. Insulate piping as required and noted under the plumbing drawings and specifications.
   2. Exterior Surfaces: Smooth non-absorbent, non-abrasive surfaces.
   3. Color: White.
   4. Fasteners: Manufacturer recommended fasteners.
   5. Products:
      a. Zurn Water, LLC; Vandal Guard Shield: Z6900-VG
      b. Substitutions: See Section 01 60 00 - Product Requirements.

2.07 UTILITY ROOM ACCESSORIES

A. Combination Utility Shelf/Mop and Broom Holder: 0.05 inch thick stainless steel, Type 304, with 1/2 inch returned edges, 0.06 inch steel wall brackets.
   1. Drying rod: Stainless steel, 1/4 inch diameter.
   2. Hooks: Two, 0.06 inch stainless steel rag hooks at shelf front.
   3. Mop/broom holders: Three spring-loaded rubber cam holders at shelf front.
   4. Length: 36 inches.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify exact location of accessories for installation.

C. Verify that field measurements are as indicated on drawings.

D. See Section 06 10 00 - Rough Carpentry for installation of blocking and reinforcing plates in walls.

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.
   1. Refer to the drawings.

3.04 PROTECTION

A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION 10 28 00

SECTION 10 43 00
EMERGENCY AID SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Automated external defibrillators (AEDs).

B. Automated external defibrillator (AED) cabinets.

C. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.

1.03 DEFINITIONS

A. Automated External Defibrillator (AED): A Food and Drug Administration (FDA)-approved portable device, which automatically analyzes the heart rhythm and recognizes the presence of ventricular fibrillation and/or tachycardia. If defibrillation is warranted, the AED automatically charges and prompts (visual and/or audio) the operator to deliver an electrical shock.

1.04 REFERENCE STANDARDS

A. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2023a.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide AED operational features, color and finish, anchorage details, and installation instructions.

C. Shop Drawings: Indicate locations of cabinets and cabinet physical dimensions.

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 schedules and recertification requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Automated External Defibrillators (AEDs):
   1. Philips Medical Systems; _____: www.usa.philips.com/#sle.
   2. Stryker Corporation; HeartSine samaritan PAD 350P Defibrillator - PAD 350p: www.stryker.com/#sle.
   3. ZOLL Medical Corporation; _____: www.zoll.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Emergency Aid Cabinets and Accessories:
   1. Activar Construction Products Group, Inc. - JL Industries; LifeStart 1400 Series AED Cabinet: www.activarcpg.com/#sle.
   2. Modern Metal Products, a division of Technico, Inc; _____: www.modern-metal.com/#sle.
   3. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 AUTOMATED EXTERNAL DEFIBRILLATORS (AEDS)

A. Automated External Defibrillators (AEDs) - General: FDA approval required.
   1. Provide automated external defibrillators (AEDs) as indicated.

2.03 EMERGENCY AID CABINETS

A. Cabinet Configuration: Recessed type.

B. Door: 0.036 inch metal thickness, reinforced for flatness and rigidity with wire pull handle and nylon catch. Hinge door for 180 degree opening with two butt hinges.

C. Door Glazing: Tempered glass, clear, 1/8 inch thick, and set in resilient channel glazing gasket.

D. Fabrication: Weld, fill, and grind components smooth.

E. Finish of Cabinet Exterior Trim and Door: No.4 - Brushed stainless steel.

F. Finish of Door Pull or Handle: Stainless steel.

G. Finish of Cabinet Interior: White powder coat.

2.04 ACCESSORIES

A. Alarm Contacts: Contact devices.
   1. Magnetic door contact for existing alarm systems.

B. Cabinet Door Signage: 'AED" decal, or vinyl self-adhering, prespaced black lettering and identifying graphic in accordance with authorities having jurisdiction (AHJ).

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Cabinet Lettering:
   1. Location: Face of door framing.

3.03 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust cabinet doors to operate smoothly without binding. Verify that alarms and integral locking devices operate properly.

C. On completion of cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

D. Touch up marred finishes. Replace cabinets that cannot be restored to factory-finished appearance. Use materials and procedures recommended by cabinet manufacturer.

END OF SECTION 10 43 00

SECTION 10 44 00
FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fire extinguishers.

B. Fire extinguisher cabinets.

C. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.

1.03 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.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide extinguisher operational features, extinguisher ratings and classifications, color and finish, anchorage details, and installation instructions.

C. Shop Drawings: Indicate locations of cabinets, cabinet physical dimensions, rough-in measurements for recessed cabinets, locations of individual fire extinquishers, 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.

1.05 FIELD CONDITIONS

A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fire Extinguishers:
   1. JL Industries, Inc: www.jlindustries.com.
   2. Larsen's Manufacturing Co: www.larsensmfg.com
   3. Potter-Roemer: www.potterroemer.com.
   4. Strike First Corporation of America: www.strikefirstusa.com.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Fire Extinguisher Cabinets and Accessories:
   1. JL Industries, Inc: www.jlindustries.com.
   2. Larsen's Manufacturing Co: www.larsensmfg.com.
   3. Potter-Roemer: www.potterroemer.com.
   4. Strike First Corporation of America: www.strikefirstusa.com.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 FIRE EXTINGUISHERS

A. 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.

B. Multipurpose Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gauge.
   1. Cartridge Operated: Spun shell.
   2. Class: A:B:C type.
   3. Size: 10 pound.
   4. Finish: Baked polyester powder coat, red color.

2.03 FIRE EXTINGUISHER CABINETS

A. Cabinet Construction: Non-fire rated.

B. Cabinet Configuration: Recessed type.
   1. Basis of Design: Architectural Series; Vertical Duo, No. 4 stainless steel. as manufactured by Larsen's Manufacturing Co.
   2. Size to accommodate accessories.
   3. All cabinets and accessories are to be ADA compliant.
   4. Provide cabinet enclosure with right angle inside corners and seams, and with formed perimeter trim and door stiles.

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.

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. Fabrication: Weld, fill, and grind components smooth.

G. Finish of Cabinet Exterior Trim and Door: No.4 - Brushed stainless steel.

H. Finish of Cabinet Interior: White colored enamel.

2.04 ACCESSORIES

A. Extinguisher Brackets: Formed steel, chrome-plated.

B. Cabinet Signage: "Fire Extinguisher".

C. Lettering: FIRE EXTINGUISHER decal, or vinyl self-adhering, pre-spaced black lettering in accordance with authorities having jurisdiction (AHJ).

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, 27 inches from finished floor to inside bottom of cabinet.

C. Secure rigidly in place.

D. Place extinguishers in cabinets.

3.03 SCHEDULES

A. Refer to Drawing for locations.

END OF SECTION 10 44 00

SECTION 10 51 13
METAL LOCKERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal lockers.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Concrete base construction.

B. Section 06 10 00 - Rough Carpentry: Wood blocking and nailers.

1.03 REFERENCE STANDARDS

A. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2023a.

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 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.

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; 2024.

E. ASTM F1267 - Standard Specification for Metal, Expanded, Steel; 2018 (Reapproved 2023).

1.04 SUBMITTALS

A. See Section 01 30 00 - 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 3 by 6 inches in size showing color and finish of metal locker material.

E. Manufacturer's Installation Instructions: Indicate component installation assembly.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect locker finish and adjacent surfaces from damage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Lockers:
   1. Art Metal Products; ____: www.artmetalproducts.com/#sle.
   2. ASI Storage Solutions; _____: www.asi-storage.com/#sle.
   3. Lyon Workspace Products; ____: www.lyonworkspace.com/#sle.
   4. Penco Products, Inc; ____: www.pencoproducts.com/#sle.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 LOCKER APPLICATIONS

A. Locker: Metal lockers, free-standing with matching closed base.
   1. Width: 12 inches.
   2. Depth: 12 inches.
   3. Height: 72 inches.
   4. Configuration: Two tier.
   5. Fittings: Size and configuration as indicated on drawings.
      a. Hat shelf.
      b. Hooks: One double prong.

6. Ventilation: Louvers at top and bottom of door panel.
7. Locking: Padlock hasps, for padlocks provided by Owner.
8. Provide sloped top.
9. Color: To be selected from manufacturer's full range by Architect.

2.03 METAL LOCKERS

A. Locker Case Construction:
   1. Heavy-Duty, Welded Construction: Made of formed and welded together sheet steel; metal edges finished smooth without burrs; baked enamel or powder coat finished inside and out.
      a. Assembly: Do not use bolts, screws, or rivets to assemble locker bodies.
      b. Locker Body Components: Formed and flanged from steel sheet of the following type and minimum thicknesses:
         1) Unperforated Steel Sheet: Commercial Steel (CS), Type B, supplied for exposed applications and complying with ASTM A1008/A1008M and the following:
            (a) Zinc-Coated by the Hot-Dip Process: Comply with ASTM A653/A653M, coating designation G60/Z180.
         2) Body and Shelves: 16 gauge, 0.0598 inch.
         3) Backs: 18 gauge, 0.0478 inch.
         4) Base: 18 gauge, 0.0478 inch.
            (a) Height: 4 inches.
      c. Frames: Formed channel shape, welded and ground flush, welded to body, resilient gaskets and latching for quiet operation.
         1) Door Frame: 16 gauge, 0.0598 inch, minimum.
      d. Where ends or sides are exposed, provide flush panel closures.
      e. Provide filler strips where indicated or required, securely attached to lockers.

B. Latches and Door Handles: Manufacturer's standard.
   1. Latching: Manufacturer's standard for locking arrangement selected.
      a. Single-Point Latch: Provide for doors indicated.
         1) Stationary latch welded securely to locker frame.
         2) Latch extends no more than 1-1/4 inch into locker opening, penetrating through cup.
         3) Flush-mounted, recessed stainless steel cup in a formed door with 18 gauge, 0.0478 inch vertical back panel stiffener.

C. Sloped Top: 20 gauge, 0.0359 inch, with closed ends.

D. Coat Hooks: Stainless steel or zinc-plated steel.

E. Number Plates: Provide oval shaped aluminum plates. Form numbers ____ inch high of block font style with ADA designation, in contrasting color.

F. Locks: Locker manufacturer's standard type indicated in Applications article above.

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. Place and secure on prepared base.

C. Install lockers plumb and square.

D. Install end panels, filler panels, and sloped tops.

E. Install fittings if not factory installed.

F. Replace components that do not operate smoothly.

END OF SECTION 10 51 13

SECTION 10 75 00
FLAGPOLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum Flagpoles.

1.02 REFERENCE STANDARDS

A. AASHTO M 36 - Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains; 2024.

B. ASTM A312/A312M - Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes; 2025.

C. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

D. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

E. NAAMM FP 1001 - Guide Specifications for Design Loads of Metal Flagpoles; 2007.

1.03 SUBMITTALS

A. Product Data: Provide data on pole, accessories, and configurations.

B. Shop Drawings: Indicate detailed dimensions, base details, anchor requirements, and imposed loads.

C. Operation Data: Provide operating data for the controller and timer.

D. Maintenance Data: Provide lubrication and periodic maintenance requirement schedules and any other requirements.

1.04 QUALITY ASSURANCE

A. Designer Qualifications: Design flagpole foundation under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed the State in which the Project is located.

1.05 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. American Flagpole: www.americanflagpole.com.
   2. Concord Industries, Inc: www.concordindustries.com.
   3. Pole-Tech Co., Inc: www.poletech.com.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 FLAGPOLES

A. Flagpoles: Designed in accordance with NAAMM FP 1001
   1. Material: Aluminum.
   2. Design: Cone tapered.
   3. Mounting: Ground mounted type.
   4. Nominal Height: 30 ft; measured from nominal ground elevation.
   5. Halyard: Internal type, electric operation.
   6. Finish: Satin Aluminum

B. Performance Requirements:
   1. Flagpole With Flag Flying: Resistant without permanent deformation to 90 miles/hr wind velocity; non-resonant, safety design factor of 2.5.
   2. Flagpole Without Flag: Resistant without permanent deformation to 130 miles/hr wind velocity; non-resonant, safety design factor of 2.5.

2.03 POLE MATERIALS

A. Aluminum: ASTM B221 (ASTM B221M) , 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. Flag: United States design, 48 x 72 inch size, Nylon fabric, brass grommets, hemmed edges.

D. Cleat Box: Stainless steel, with built-in hinge and hasp assembly, attached to pole with tamper proof screws inside box.

E. Halyard: 5/16 inch diameter nylon, braided, white.

2.05 OPERATORS

A. Internal, manually operated cam clete.

2.06 MOUNTING COMPONENTS

A. Foundation Tube Sleeve: AASHTO M 36, corrugated 16 gauge, 0.0598 inch steel, galvanized, depth of ____ inches as indicated.

B. Pole Base Attachment: Flush; aluminum base with base cover.

2.07 FINISHING

A. Aluminum: Mill 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 30 00.

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 and flag function smoothly.

3.06 SCHEDULES

A. One 30 foot pole, with U.S. flag located near monumental sign.

END OF SECTION 10 75 00

SECTION 11 61 43
STAGE CURTAINS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Stage curtain fabrics.

B. Linings.

C. Scrims and drops.

D. Stage curtain track support systems.

1.02 REFERENCE STANDARDS

A. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2024.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

C. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

D. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

E. FM (AG) - FM Approval Guide; Current Edition.

F. ITS (DIR) - Directory of Listed Products; current edition.

G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

H. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2023, with Errata.

I. UL (DIR) - Online Certifications Directory; Current Edition.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide for each type of product as follows:
   1. Stage Curtains: Provide information on type of curtain, weight, location for use on project, and type of flame retardancy.

C. Shop Drawings: Indicate installation information for components not dimensioned or detailed in product data.
   1. Submit floor plans, elevations, sections, attachment details of curtains and operating clearances.
   2. Submit fabric assembly and support details.
   3. Submit documentation indicating load capacity of each batten, track, attachment, and rigging components.

D. Selection Samples: Submit color chart for each type of stage curtain indicated that includes full range of colors, textures, and patterns available, along with 12-inch square fabric sample, in any color, of each fabric type and seam.

E. Verification Samples: Submit fabric full width by at least 12-inch long section of each selected fabric from dye lot to be used for this work, with specified treatments applied and showing repeat of patterns; mark top and face of fabric.

F. Delegated Design Data: Indicate stage curtain system structural attachments, including analysis data signed and sealed by qualified designer responsible for their preparation.

G. Operation and Maintenance Data: For stage curtains and rigging operations.

H. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project:
   1. See Section 01 60 00 - Product Requirements, for additional provisions.

1.04 FIELD CONDITIONS

A. Ambient Conditions: Do not install stage curtains until spaces are fully enclosed and watertight, and the following:
   1. Wet work in adjacent areas is complete and surfaces are dry.
   2. Work at and above ceiling level has been completed.
   3. Ambient temperatures and humidity of adjacent areas are maintained at levels when occupied for intended use.

B. Field Measurements: Confirm supporting structural element locations and adjacent construction for stage curtains and rigging, and complete field measurements prior to fabrication and include these dimensions on shop drawings.

1.05 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a two year period after Date of Substantial Completion.
   1. Defective Work includes, but is not limited to, stage curtain support and rigging that is not operating properly.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Stage Curtain Fabrics:
   1. Beck Studios Inc: www.beckstudios.net/#sle.
   2. Fred Krieger & Company: www.fredkriegerfabrics.com/#sle.
   3. KM Fabrics, Inc: www.kmfabrics.com/#sle.
   4. LuXout Stage Curtains: www.luxout.com/#sle.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

A. Stage Curtain Systems Design: Engage qualified designer to develop design of stage curtain system, including comprehensive project specific analysis of necessary structural system attachments in compliance with performance requirements.

B. Structural Performance: Ensure attachment of stage curtain system to structure withstands material weight and operational loads applicable for this project and in compliance with local building codes and authorities having jurisdiction.
   1. Design Loads: Weight of stage curtains and track system.

C. Fire-Test Characteristics: Stage curtain fabrics in compliance with NFPA 701 flame propagation fire test requirements conducted by authorized testing agency, listed by UL (DIR), ITS (DIR), or FM (AG) and acceptable to authorities having jurisdiction.
   1. Permanently attach label to fabric of each curtain assembly indicating fabric treatment as follows:
      a. Inherently Flame Retardant (IFR), fibers/yarns that are non-combustible for life of fabric.

D. Electrical Components: Devices that are listed and labeled in compliance with NFPA 70, by a qualified testing agency, and marked for designated application.

2.03 STAGE CURTAIN FABRICS

A. Provide curtains of matching fabric and color from single dye lot, and when size and quantity of curtains exceeds maximum dye lot size, provide curtain or adjacent pair of curtains from only one dye lot, and arrange curtain dye lots to minimize exposure of any differences.

B. Type A - Polyester Velour: Weighing at least 25 oz/linear yd, napped fabric of 100 percent polyester with minimum pile height of 75 mil, 0.075 inch and minimum width of 54 inches.
   1. Application: Main Traveler, Main Valance, Olio Traveler, Olio Legs, Olio Valance, Cyclorama Traveler, Cyclorama Legs, Cyclorama Border, and _____ curtains
   2. Color: As selected by Architect from manufacturer's full range.
   3. Texture: As selected by Architect from manufacturer's full range.
   4. Pattern: As selected by Architect from manufacturer's full range.
   5. Products:
      a. Fred Krieger & Company; IFR Epic Velour 25 oz: www.fredkriegerfabrics.com/#sle.
      b. KM Fabrics, Inc; IFR Prestige Velvet/Velour 25 oz: www.kmfabrics.com/#sle.
      c. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 LININGS

A. Type LA - Light-Weight Polyester Lining: Weighing at least 10 oz/linear yd, 100 percent polyester fabric; 72-inch minimum width.
   1. Color: Black.

2.05 SCRIMS AND DROPS

A. Type SA - Scrim: Lightweight seamless gauze flat sewn fabric with an open weave.
   1. Application: Cyclorama, Skydrop, Backdrop, and _____ curtains.
   2. Color: As selected by Architect from manufacturer's full range.
   3. Continuous 6-inch high pipe pocket at bottom of curtain with 6-inch flap of matching fabric in front of pocket.
   4. 3-1/2-inch high double-stitched jute or laminated synthetic webbing at top of curtain with at least No. 2 brass grommets spaced at 12 inches on center and 1 inch from top corner of curtain.
   5. At least 2-inch wide double-folded side hem and 4-inch wide bottom hem.
   6. Fabric: Weighing at least 29 oz/linear yd, 100 percent cotton or 95 percent cotton and 5 percent polyester; 30-feet minimum width.
   7. Products:
      a. Fred Krieger & Company; Fred Krieger FR Sharktooth Scrim: www.fredkriegerfabrics.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

2.06 CURTAIN TRACK

A. Aluminum Track: Extruded aluminum, ASTM B221(ASTM B221M); alloy and temper as recommended by manufacturer as required for strength and corrosion resistance; mill finish; including support and operation accessories.
   1. Thickness: As recommended by manufacturer for curtain loads and operation.
      a. Heavy-Duty: 0.125-inch minimum thickness.

B. Curtain Rails: Provide single or double curtain capacity as indicated on drawings, and end stops.

C. Curved-Suspended-Track Stiffener: Steel pipe, 1-1/2-inch nominal diameter, Grade A, Schedule 40 in accordance with ASTM A53/A53M; support both sections of curved suspended tracks, with curve to match track.

D. Clamp and Bracket Hangers: Steel clamps and brackets of required strength to support loads for attaching track to overhead support.

E. Track-Lap Clamp: Clamp that matches track channel finish as necessary for attaching two tracks at center overlap.

F. Folding Guide: Carriers, as indicated on drawings, with rear-fold or backpack guide and rubber spacers to fold curtain from offstage end of curtain; size for use with operating line as required.

G. Operation:

1. Manual Walk-Along Operation: Curtain track without a cord, cable, pulleys, or floor pulley; must walk with curtain to open and close.

H. Track System: Provide heavy-duty curtain track with components as recommended by manufacturer for loads and operation, including track end stops.
   1. Carriers: Standard plated-steel carriers with a pair of nylon tired ball-bearing wheels riveted parallel to body, and equip carriers with rubber or neoprene bumpers to reduce noise and plated-steel swivel eye and trim chain for attaching curtain snap or S-hook, and required number of curtain carriers for track length and curtain fabrication.
      a. Master Curtain Carriers: One plated-steel master carrier for each leading curtain edge, with two pairs of nylon tired ball-bearing wheels and with two line guides per carrier.
   2. Pulleys: One dead-end, single-wheel pulley; one live-end, double-wheel pulley; and one adjustable pulley to maintain proper tension on operating line; each with molded-nylon-tired ball-bearing sheaves enclosed in steel housings; pulleys with steel housing finished to match track and with bracket for securing off-stage end of curtain.

2.07 FABRICATION - CURTAINS

A. General: Provide vertical seams unless otherwise indicated, locate vertical seams so they do not fall on faces of pleats, and only use fabric that is cut greater than half the width of fabric.
   1. Facing the full width of material at center meeting edges.
   2. Curtains that are tabled square, and hems that don't pucker.
   3. 1-1/2-inch clearance from floor at bottom of curtain.
   4. Curtains are 24 inches longer than clear height of valance opening.
   5. Curtains that overlap 36 inches at the center.
   6. Curtains that extend 24 inches on each side beyond full width of proscenium opening.

B. Vertical and Top Hems: Machine sew hems as follows, unless otherwise indicated:
   1. Vertical Hems: Fabricate at least 2 inches wide, and at least 4 inches wide at borders, valances, teasers, and tormentors with at least 1-inch tuck and without visible selvedge material from front of curtain; sew open ends of hems closed.
   2. Turnbacks: Fabricate leading-edge and trailing-edge turnbacks for traveler curtains by folding back at least 12 inches of face fabric, with at least 1-inch tuck, and vertically secured by sewing.
   3. Top Hems: Fabricate by double-stitching 3-1/2-inch wide heavy jute or laminated synthetic webbing to top edge at back side of curtain, and with at least 2 inches of face fabric turned under.

C. Fullness:
   1. Flat: Zero percent fullness in curtains.

D. Grommets:
   1. Black Colored Curtains: No. 3 brass, No, 4 brass, or aluminum grommets with black finish.

E. Bottom Hems: Machine sew hems as follows, unless otherwise indicated:

2.08 ACCESSORIES

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine areas and conditions, with installer present, for compliance with requirements for supporting structural members, blocking, clearances, installation tolerances, and other conditions that may impact performance of stage curtain assembly.

B. Examine placement and condition of inserts, clips, blocking, or other supports installed by others and for use in supporting track and battens of stage curtain assembly.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION, GENERAL

A. Install stage curtain assembly in accordance with curtain and track manufacturers written instructions.

3.03 INSTALLATION - CURTAIN

A. Track Hung: Secure curtains to track carriers with S-hooks.

3.04 INSTALLATION - TRACK

A. Mounting of Track Assembly:
   1. Ceiling Mounted: Provide ceiling supports for mounting track direct to ceiling structure and within intervals indicated in manufacturer's written instructions for on center spacing.

B. Track Support Spacing: Comply with manufacturer's recommendations for applied loads, and not to exceed the following dimensions between track supports:
   1. Heavy-Duty Track: 6 feet, maximum.

C. Install track for center-parting curtains with at least 24-inch overlap of track sections at center-line, and supported with track lap clamps.

3.05 CLOSEOUT ACTIVITIES

A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.

B. See Section 01 79 00 - Demonstration and Training, for additional requirements.

C. Demonstrate proper operation of equipment to Owner's designated representative.

D. Demonstration: Demonstrate operation of system to Owner's personnel.
   1. Use operation and maintenance data as reference during demonstration.
   2. Briefly describe function, operation, and maintenance of each component.

E. Training: Train Owner's personnel on operation and maintenance of system.
   1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
   2. Provide minimum of two hours of training.

END OF SECTION 11 61 43

SECTION 11 66 23
GYMNASIUM EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Basketball backboards, goals, and support framing.

B. Gymnasium exercise equipment.

C. Floor anchors for tensioned elements.

D. Floor sleeves for net and goal posts.

E. Wall mounted protection pads.

F. Gym divider curtains.

G. Volleyball nets and posts.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Concrete floor slab to receive floor sleeves and anchors.

B. Section 05 12 00 - Structural Steel Framing: Structural members supporting basketball systems.

C. Section 05 50 00 - Metal Fabrications: Secondary structural members supporting gymnasium equipment.

D. Section 09 65 66 - Resilient Athletic Flooring: Gymnasium flooring.

E. Section 26 05 83 - Wiring Connections.

1.03 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.

B. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

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 30 00 - 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. Fire rating certifications.
   3. Structural steel welder certifications.
   4. 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 gauge 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.

E. Samples: Submit samples of wall pad coverings in manufacturer's available range of colors.

F. Operating and maintenance data for each operating equipment item.

G. 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 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide five year manufacturer warranty for basketball goals.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Gymnasium Equipment:
   1. ADP Lemco, Inc; _____: www.adplemco.com/#sle.
   2. Draper, Inc; _____: www.draperinc.com/#sle.
   3. Bison Inc Indoor Wall Pads: www.bisoninc.com
   4. Performance Sports Systems; _____: www.perfsports.com/#sle.
   5. Porter Athletic Equipment Company; _____: www.porterathletic.com/#sle.
   6. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 GENERAL REQUIREMENTS

A. See drawings for sizes and locations, unless noted otherwise.

B. Where mounting dimensions or sizes are not indicated, comply with applicable requirements of the following:

C. Provide mounting plates, brackets, and anchors of sufficient size and strength to securely attach equipment to building structure; comply with requirements of Contract Documents.

D. Hardware: Heavy duty steel hardware, as recommended by manufacturer.

E. Electrical Wiring and Components: Comply with NFPA 70; provide UL-listed equipment.

F. Structural Steel Fabrications: Welded in accordance with AWS D1.1/D1.1M, using certified welders.

2.03 BASKETBALL

A. Basketball System: Backstop assembly, backboard, and goal.
   1. Manufacturers:
      a. ADP Lemco, Inc; _____: www.adplemco.com/#sle.
      b. Draper, Inc; _____: www.draperinc.com/#sle.
      c. IPI by Bison, Inc; _____: www.ipibybison.com/#sle.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

B. Wall-Mounted Backstop Assemblies: Wall-mounted steel frame assembly capable of mounting both rectangular and fan-shaped backboards.
   1. Framing: Side-folding retractable framing. Refer to Drawings for Locations.

2. Framing Color: As selected from manufacturer's standard selection.

C. Ceiling-Suspended Backstop Assemblies: Capable of mounting both rectangular and fan-shaped backboards. Refer to drawings for locations.
   1. Framing: Center strut; forward folding framing.
   2. Folding Control System: Electric hoist that folds backstop with 115 volt actuator, integral limit switches that provide automatic shut-off in both positions, and safety catch with automatic reset.
   3. Height Adjuster: Raises or lowers assembly by 2 feet to adjust goal height.
      a. Height Control System: Electric hoist that adjusts backstop with 115 volt actuator, and integral limit switches that provide automatic shut-off in both positions.
   4. Framing Color: As selected from manufacturer's standard selection.

D. Backboards: Tempered glass, rectangular shaped.
   1. Frame: Brushed aluminum edge, steel mounting.
   2. Dimensions: 42 inches high by 72 inches wide
   3. Markings: Painted.
   4. Provide safety padding for bottom edge of backboard.
   5. Provide mounting kit.
   6. Color: Manufacturer's standard.
   7. Basis of Design: B208 manufactured by Porter Athletic

E. Goals: Steel rim, mounted to backboard, with attached nylon net; complete with mounting hardware.
   1. Net Attachment Device: Tube-tie.
   2. Breakaway mechanism, adjustable.
   3. Finish: Powder coat orange.
   4. Basis of Design: B-23302 - Power-Flex Goal with tube ties manufactured by Porter Athletic.

2.04 FLOOR-MOUNTED EQUIPMENT

A. Volley Ball Nets and Posts: One court system of adjustable posts, net, and tensioning winch meeting requirements for FIVB, USA Volleyball, NCAA and NFHS competition requirements.
   1. Posts: 3-1/2 inch O.D. schedule 80 aluminum tube with 1 inch height adjustments between 42 and 96 inches.
   2. Net: 4 inch square #36 nylon cord with vinyl coated polyester hem, double stitched around the perimeter.
   3. Tensioning Winch: Manual crank heavy duty, self-locking worm gear mechanism.

B. Floor Sleeves for Posts: Metal sleeve, with latch cover, cast into concrete subfloor to hold poles for nets and goals; installed flush with finish floor surface.
   1. Latch Cover: Chrome plated, round; tamper resistant lock with key.
   2. Sleeve: Aluminum.
   3. Depth of Sleeve: 9 inches from floor surface to bottom, including latch cover.

2.05 WALL PADDING

A. Wall Padding: 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. 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, minimum.
   3. Foam, Fire-Rated: Open cell polychloroprene (Neoprene), with 5.5 pcf nominal density.

4. Foam Thickness: 2 inches.
5. Backing Board: Plywood.
    a. 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.
6. Panel Dimensions: 24 inches wide by 72 inches long, including nailing margins.
7. Mounting: Removable; Z-clips fixed to wall and to padding.
8. Product: 2" Impact Safe wall pad no nailing margin manufactured by Porter Athletic.

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 11 66 23

SECTION 11 68 33
ATHLETIC FIELD EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Outdoor basketball equipment.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Footings for field equipment.

B. Section 31 22 00 - Grading: Shaping subgrade to specified grade levels.

1.03 REFERENCE STANDARDS

A. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2024.

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.

C. ASTM A135/A135M - Standard Specification for Electric-Resistance-Welded Steel Pipe; 2021.

D. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.

E. ASTM A513/A513M - Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing; 2025.

F. ASTM B26/B26M - Standard Specification for Aluminum-Alloy Sand Castings; 2018, with Editorial Revision.

G. ASTM B108/B108M - Standard Specification for Aluminum-Alloy Permanent Mold Castings; 2019.

H. ASTM B179 - Standard Specification for Aluminum Alloys in Ingot and Molten Forms for Castings from All Casting Processes; 2018.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meetings: Convene a meeting one week before starting this work to discuss coordination between various installers.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store equipment on project site in accordance with manufacturer's recommendations.

B. Store materials in a dry, covered area, and elevated above grade.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide 1-year warranty against defects in materials and workmanship unless otherwise specified.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Athletic Field Equipment:
   1. ADP Lemco, Inc: www.adplemco.com/#sle.
   2. Grand Slam Safety, LLC: www.grandslamsafety.com/#sle.
   3. Draper, Inc., 411 South Pearl Street, Spiceland, Indiana 47385-0425; 765-987-7999.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ATHLETIC FIELD EQUIPMENT - GENERAL

A. Mount supporting posts in concrete footings, unless otherwise indicated, refer to Section 03 30 00 for additional concrete footing installation requirements.

B. Coordinate field grading as required for proper placement and arrangement of equipment, refer to Section 31 22 00 for additional information.

2.03 OUTDOOR BASKETBALL EQUIPMENT

A. Outdoor Basketball Support Post: Galvanized steel support post, with 4-1/2 inch diameter.
   1. Gooseneck style with 5 feet extension and 18 inch to 24 inch radius.
   2. Cap top of post to protect from weather.
   3. Anchor post in concrete footing; provide lug in support post to prevent rotation in footing.

B. Backboard: Anchored to support post or extension arms.
   1. Fan shaped cast aluminum backboard with perimeter flange and reinforcing ribs, 54 inch by 39 inch overall size.
   2. Color and Finish: White with powder coat finish, with contrast colored target and border lines.

C. Goal: Anchored to mounting plate through backboard to support post or extension arms.
   1. Outdoor Breakaway goal with nylon net.
   2. Color and Finish: Orange powder coat.
   3. Fabric Net: White braided nylon.

2.04 MATERIALS

A. Steel Pipe and Tube: Complying with ASTM A135/A135M, ASTM A500/A500M, or ASTM A513/A513M; hot-dip galvanized and free of excess weld and spatter.
   1. Tensile Strength: 45,000 psi, minimum.
   2. Yield Point: 33,000 psi, minimum.
   3. Galvanizing: Hot-dip metal components in zinc after fabrication, in accordance with ASTM A123/A123M; remove tailings and sharp protrusions and burnish edges.

B. Cast Aluminum: ASTM B26/B26M, ASTM B108/B108M, or ASTM B179.

C. Powder Coating for Steel: Electrostatically applied and oven cured polyester powder over electrostatic zinc coating.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that athletic field equipment area has been graded to subgrade elevations required and that excess soil, rocks, and debris has been removed as necessary for installation of footings.

B. Verify location of underground utilities and facilities in athletic field equipment area; damage to underground utilities and facilities will be repaired at Contractor's expense.

3.02 PREPARATION

A. Stake location of athletic field equipment elements, including necessary athletic field perimeters, surfacing, access and egress points, hard surfaces, walls, fences, _____, and/or structures.

B. Stake layout of athletic field equipment perimeter in accordance with approved shop drawings before starting any work.
   1. Verify that athletic field perimeters do not overlap hard surfaces, whether currently installed or not.
   2. Verify that athletic fields are free of obstructions.
   3. If conflicts or obstructions are found, notify Architect.
   4. Do not proceed with this work until revised drawings have been provided, showing corrected layout, and that any obstructions have been removed or corrections to layout have been made.

3.03 INSTALLATION

A. Install concrete footings with top surface a minimum of 1/2 inch below required subgrade elevation and slope top to drain, unless otherwise indicated.

B. Install athletic field equipment in accordance with manufacturer's instructions, and rules and regulations of specified athletic association indicated for this work.

C. Install backboards and goal posts plumb, level, and rigid using manufacturer provided attachment hardware, and ensure backstops are accurately positioned and free of vibrations.

D. Install athletic field equipment without sharp points, edges, or protrusions; entanglement hazards or pinch, crush, or shear points.

3.04 CLEANING

A. Clean athletic field equipment of construction materials, dirt, stains, filings, and blemishes due to shipment or installation; clean in accordance with manufacturer's instructions, using cleaning agents as recommended by manufacturer.

B. Clean athletic field area of excess construction materials, debris, and waste.

C. Remove excess and waste material and dispose of off-site in accordance with requirements of authorities having jurisdiction.

3.05 PROTECTION

A. Protect installed products until Date of Substantial Completion.

B. Replace damaged products before Date of Substantial Completion.

END OF SECTION 11 68 33

SECTION 12 24 00
WINDOW SHADES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Interior manual roller shades.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Concealed wood blocking for attachment of headrail brackets.

1.03 REFERENCE STANDARDS

A. ASTM E2180 - Standard Test Method for Determining the Activity of Incorporated Antimicrobial Agent(s) in Polymeric or Hydrophobic Materials; 2018.

B. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).

C. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2023, with Errata.

D. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

E. WCMA A100.1 - Standard for Safety of Window Covering Products; 2022.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week prior to commencing work related to products of this section; require attendance of affected installers.

B. Sequencing:
   1. Do not fabricate shades until field dimensions for each opening have been taken with field conditions in place.
   2. Do not install shades until final surface finishes and painting are complete.

1.05 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog pages and data sheets, including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.

B. 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.

C. Certificates: Manufacturer's documentation that line voltage components are UL listed or UL recognized.

D. Source Quality Control Submittals: Provide test reports indicating compliance with specified fabric properties.

E. Selection Samples: Include fabric samples in full range of available colors and patterns.

F. Verification Samples: Minimum size 6 inches square, representing actual materials, color and pattern.

G. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation, and installation of product.

H. Operation and Maintenance Data: List of all components with part numbers, sources of supply, and operation and maintenance instructions; include copy of shop drawings.

I. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.

1.06 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.

1.07 FIELD CONDITIONS

A. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Provide manufacturer's warranty from Date of Substantial Completion, covering the following:
   1. Shade Hardware: One year.
   2. Fabric: One year.
   3. Aluminum and Steel Coatings: One year.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Interior Manually Operated Roller Shades:
   1. Draper, Inc; Clutch Operated FlexShade NEXD: www.draperinc.com/#sle.
   2. Hunter Douglas Architectural; RB500 Manual Roller Shades: www.hunterdouglasarchitectural.com/#sle.
   3. MechoShade Systems LLC; Mecho/7 System: www.mechoshade.com/#sle.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Shade Fabric:
   1. Mermet Corporation: www:memetusa.com
   2. Phifer, Inc: www.phifer.com
   3. Substitutions: See Section01 60 00-Product Requirements.

C. Source Limitations: Furnish productsproduced by a single manufacturer and obtained from a single supplier.

2.02 WINDOW SHADE APPLICATIONS

A. Shades at exterior glazed openings. Privacy shades.
   1. Fabric preformance requirements.
      a. Openess factor: 3%
   2. Color: As selected by Architect from manufacturer's full range of colors.

B. Shades at interior classrom side lites for security protocol
   1. Fabric preformance requirements
      a. Blackout shades.
   2. Color: As selected by Architect from manufacturer's full range of colors.

2.03 ROLLER SHADES

A. General:
   1. Provide shade system components that are easy to remove or adjust without removal of mounted shade brackets.
   2. Provide shade system that operates smoothly when shades are raised or lowered.

B. Roller Shades:
   1. Description - Interior Roller Shades: Single roller, manually operated fabric window shade system complete with mounting brackets, roller tubes, hembars, hardware, and accessories.
      a. Drop Position: Regular roll.
      b. Roll Direction: Roll down, closed position is at window sill.
      c. Mounting: Window jamb mounted - inside, between jambs.

2. Brackets and Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
3. Roller Tubes: As required for type of shade operation.
4. Hembars: Designed to maintain bottom of shade straight and flat.
5. Manual Operation for Interior Shades:
    a. Clutch Operator: Manufacturer's standard material and design, permanently lubricated.
    b. Drive Chain: Continuous loop, beaded ball chain with restraining device, 95 lb minimum breaking strength; comply with WCMA A100.1. Provide upper and lower limit stops.
6. Accessories:
    a. Fascia: Extruded aluminum, size as required to conceal shade mounting, attachable to brackets without exposed fasteners; Architect to select from full range of colors include anodized finishes.
    b. End Caps: Provide manufacturer's standard end caps to cover exposed ends of brackets.

2.04 ROLLER SHADE FABRICATION

A. Field measure finished openings prior to ordering or fabrication.

B. Dimensional Tolerances: 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 stool.
2. Horizontal Dimensions - Inside Mounting: Fill openings from jamb to jamb.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine finished openings for deficiencies that may preclude satisfactory installation.

B. Start of installation shall be considered acceptance of substrates.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.

B. Adjust level, projection, and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure smooth shade operation.

3.03 CLEANING

A. Clean soiled shades and exposed components as recommended by manufacturer.

B. Replace shades that cannot be cleaned to "like new" condition.

3.04 CLOSEOUT ACTIVITIES

A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.

B. See Section 01 79 00 - Demonstration and Training, for additional requirements.

C. Demonstration: Demonstrate operation and maintenance of window shade system to Owner's personnel.

3.05 PROTECTION

A. Protect installed products from subsequent construction operations.

END OF SECTION 12 24 00

SECTION 12 36 00
COUNTERTOPS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Countertops for architectural cabinet work.

B. Solid Surface Benches and Paneling

C. Countertops for manufactured casework.

1.02 RELATED REQUIREMENTS

A. Section 06 41 00 - Architectural Wood Casework.

B. Section 22 40 00 - Plumbing Fixtures: Sinks.

1.03 REFERENCE STANDARDS

A. ANSI A208.1 - American National Standard for Particleboard; 2022.

B. ANSI A208.2 - Medium Density Fiberboard (MDF) for Interior Applications; 2022.

C. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2022.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.

E. AWI (QCP) - Quality Certification Program; Current Edition.

F. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

G. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

H. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.

I. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

J. PS 1 - Structural Plywood; 2023.

1.04 SUBMITTALS

A. See Section 01 30 00 - 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 ; combine with shop drawings of cabinets and casework specified in other sections.

D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finish product specified, minimum size 6 inches square, representing actual product, color, and patterns.

F. Test Reports: Chemical resistance testing, showing compliance with specified requirements.

G. Certificate: Submit labels and certificates required by quality assurance and quality control programs.

H. Installation Instructions: Manufacturer's installation instructions and recommendations.

I. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.05 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.

B. Quality Certification:
   1. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
   2. Provide designated labels on shop drawings as required by certification program.
   3. Provide designated labels on installed products as required by certification program.
   4. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

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 local 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.

PART 2 PRODUCTS

2.01 COUNTERTOPS, WALL PANELS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

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) Wilsonart[<>]: www.wilsonart.com/#sle. Basis of Design
         2) Formica Corporation: www.formica.com/#sle.
         3) Panolam Industries International, Inc. Nevamar: www.nevamar.com.
         4) Panolam Industries International, Inc. Pionite: www.pionitelaminates.com.
         5) Substitutions: See Section 01 60 00 - 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. Wear Resistance: In addition to specified grade, comply with NEMA LD 3 High Wear Grade requirements for wear resistance.
      d. Finish: Matte or suede, gloss rating of 5 to 20.
      e. Surface Color and Pattern: As selected by Architect from the manufacturer's full line.
   2. Exposed Edge Treatment: Molded PVC edge with T-spline, sized to completely cover edge of panel.
      a. Color: As selected by Architect from the manufacturer's full line.
   3. Back and End Splashes: Same material, same construction.
   4. Fabricate in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 11 - Countertops, Custom Grade.

C. Solid Surfacing Countertops and Wall Paneling: Solid surfacing sheet or plastic resin casting over continuous substrate.
   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) Dupont: www.corian.com/#sle. (Basis of Design)
      (a) Refer to drawings for locations.
   2) Plygood: www.polygood.com (Basis of Design)
      (a) Refer to drawings for locations.
   3) Durat USA: durat.fi/en
   4) Formica Corporation: www.formica.com/#sle.
   5) Wilsonart: www.wilsonart.com/#sle.
   6) Substitutions: See Section 01 60 00 - 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.
e. Color and Pattern: As selected by Architect from manufacturer's full line.

3. Other Components Thickness: 1/2 inch, minimum.
4. Exposed Edge Treatment: Built up to minimum 1-1/4 inch thick; radiused edge; use marine edge at sinks.
5. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.
6. Skirts: As indicated on drawings.
7. Fabricate in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 11 - Countertops, Premium Grade.

2.02 MATERIALS

A. Particleboard for Supporting Substrate: ANSI A208.1 Grade 2-M-2, 45 pcf minimum density; minimum 3/4 inch thick; join lengths using metal splines.

B. Medium Density Fiberboard for Supporting Substrate: ANSI A208.2.

C. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

D. Joint Sealant: Mildew-resistant silicone sealant, Color to be selected by Architect.

2.03 ACCESSORIES

A. Fixed Top-Mounted Countertop Support Brackets:
   1. Material: Steel.
   2. Finish: Manufacturer's standard, factory-applied, textured powder coat.
   3. Products:
      a. Centerline Brackets; Floating Wall Mount: www.countertopbracket.com/#sle.
      b. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 FABRICATION

A. 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.
   2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
      a. Rout a 1/8 inch drip groove at underside of exposed overlapping edges, set back 1/2 inch from face of edge.
   3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.

B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
   1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.

2. Height: 4 inches, unless otherwise indicated.

C. 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.

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. Attach wood countertops using screws with minimum penetration into substrate board of 5/8 inch.

D. 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 12 36 00

SECTION 14 21 00
ELECTRIC TRACTION ELEVATORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electric traction elevator systems.

1.02 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete.

B. Section 04 20 00 - Unit Masonry.

C. Section 09 65 00 - Resilient Flooring.

D. Section 26 05 33.13 - Conduit for Electrical Systems: Electrical conduit requirements.

E. Section 26 05 83 - Wiring Connections: Wiring connection requirements.

1.03 REFERENCE STANDARDS

A. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.

B. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

C. AISC 360 - Specification for Structural Steel Buildings; 2022, with Errata (2023).

D. ASME A17.1 - Safety Code for Elevators and Escalators Includes Requirements for Elevators, Escalators, Dumbwaiters, Moving Walks, Material Lifts, and Dumbwaiters with Automatic Transfer Devices; 2022.

E. ASME A17.2 - Guide for Inspection of Elevators, Escalators, and Moving Walks Includes Inspection Procedures for Electric Traction and Winding Drum Elevators, Hydraulic Elevators, Inclined Elevators, Limited-Use/Limited-Application Elevators, Private Residence Elevators, Escalators, Moving Walks, Dumbwaiters, and Material Lifts; 2023.

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.

H. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025.

I. ITS (DIR) - Directory of Listed Products; current edition.

J. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

K. NEMA MG 00001 - Motors and Generators; 2024.

L. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

M. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025.

N. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate work with other installers to provide necessary conduits for proper installation of wiring, including but not limited to, the following:
      a. Elevator equipment devices remote from elevator machine room or hoistway.
      b. Elevator pit for lighting, sump pump, and _____.
      c. Automatic transfer switch from controller cabinet.
      d. Fire alarm panel from controller cabinet.

B. Preinstallation Meeting: Convene meeting at least one week prior to start of this work.
   1. Review schedule of installation, proper procedures and conditions, and coordination with related work.

C. Construction Use of Elevator: Not permitted.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Submit data on following items:
   1. Signal and operating fixtures, operating panels, and indicators.
   2. Car design, dimensions, layout, and components.
   3. Car and hoistway door and frame details.
   4. Electrical characteristics and connection requirements.

C. Shop Drawings: Include appropriate plans, elevations, sections, diagrams, and details on following items:
   1. Elevator Equipment and Machines: Size and location of driving machines, power units, controllers, governors, and other components.
   2. Hoistway Components: Size and location of car machine beams, guide rails, buffers, ropes, and other components.
   3. Rail bracket spacing; maximum loads imposed on guide rails requiring load transfer to building structural framing.
   4. Clearances and over-travel of car and counterweight.
   5. Locations in hoistway and machine room of traveling cables and connections for car lighting, telephone, and _____.
   6. Location and sizes of hoistway and car doors and frames.
   7. Electrical characteristics and connection requirements.
   8. Indicate arrangement of elevator equipment and allow for clear passage of equipment through access openings.

D. Samples: Submit samples illustrating car floor material, car interior finishes, car and hoistway door and frame finishes, handrail material and finish, and _____ in the form of cut sheets, finish color selection brochures, or _____.

E. Manufacturer's Qualification Statement.

F. Installer's Qualification Statement.

G. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

H. Maintenance Contract: Submit proposal to Owner for standard one year continuing maintenance contract agreement in accordance with ASME A17.1 and requirements as indicated, starting on date initial maintenance contract is scheduled to expire.
   1. Indicate in proposal the services, obligations, conditions, and terms for agreement period and for renewal options.

I. Operation and Maintenance Data:
   1. Parts catalog with complete list of equipment replacement parts; identify each entry with equipment description and identifying code.
   2. Operation and maintenance manual.
   3. Schematic drawings of equipment, and wiring diagrams of installed electrical equipment with list of corresponding symbols to identify markings on machine room and hoistway apparatus.

1.06 QUALITY ASSURANCE

A. Maintain one copy of each quality standard document on site.

B. Designer Qualifications: Design guide rails under direct supervision of a licensed Professional Structural Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

C. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum ten years documented experience.

D. Installer Qualifications: Supervisor along with trained elevator installation personnel on staff of elevator equipment manufacturer.

E. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of type specified in this section.

F. Products Requiring Fire Resistance Rating: Listed and classified by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction.

G. Products Requiring Electrical Connection: Listed and classified by UL (DIR) or testing agency acceptable to authorities having jurisdiction as suitable for the purpose indicated in construction documents.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Provide manufacturer's warranty for elevator operating equipment and devices for one year from Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Electric Traction Elevators:
   1. KONE; KONE MonoSpace 300: 3,500LB www.kone.us/#sle.

B. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 ELECTRIC TRACTION ELEVATORS

A. Electric Traction Passenger Elevator:
   1. Electric Traction Elevator Equipment:
   2. Drive System:
   3. Operation Control Type:
   4. Service Control Type:
      a. Standard service control only.
   5. Interior Car Height: 93 inch.
   6. Electrical Power: 480 volts; alternating current (AC); three phase; 60 Hz.
   7. Rated Net Capacity: 3500 pounds.
   8. Rated Speed: 100 feet per minute.
   9. Hoistway Size: As indicated on drawings.
   10. Interior Car Platform Size: As indicated on drawings.
   11. Elevator Pit Depth: 60 inch.
   12. Overhead Clearance at Top Floor: 151 inch.
   13. Travel Distance: As indicated on drawings.
   14. Number of Stops: As indicated on drawings.
   15. Number of Openings: 1 Front.
   16. Traction Machine Location: Top of hoistway shaft.

2.03 COMPONENTS

A. Elevator Equipment:
   1. Motors, Controllers, Controls, Buttons, Wiring, Devices, and Indicators: Comply with NFPA 70 requirements, and see Section 26 05 83 for additional information.
   2. Guide Rails, Cables, Counterweights, Sheaves, Buffers, Attachment Brackets and Anchors: Design criteria for components includes safety factors in accordance with applicable requirements of Elevator Code, ASME A17.1.
   3. Buffers:
   4. Lubrication Equipment:
      a. Provide grease fittings for periodic lubrication of bearings.
      b. Grease Cups: Automatic feed type.
      c. Lubrication Points: Visible and easily accessible.

B. Electrical Equipment:
   1. Motors: NEMA MG 1.
   2. Boxes, Conduit, Wiring, and Devices: Comply with NFPA 70 requirements, and see Sections 26 05 33.13 and 26 05 83 for additional information.
   3. Spare Conductors: Provide ten percent in extra conductors and two pairs of shielded audio cables in traveling cables.
   4. Include wiring and connections to elevator devices remote from hoistway and between elevator machine room. Provide additional components and wiring to suit machine room layout. See Section 26 05 83.

2.04 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with ASME A17.1, applicable local codes, and authorities having jurisdiction (AHJ).

B. Accessibility Requirements: Comply with ADA Standards.

C. Perform structural steel design, fabrication, and installation in accordance with AISC 360.

D. Perform welding of steel in accordance with AWS D1.1/D1.1M.

E. Fabricate and install door and frame assemblies in accordance with NFPA 80 and complying with requirements of authorities having jurisdiction (AHJ).

F. Perform electrical work in accordance with NFPA 70.

2.05 OPERATION CONTROLS

A. Elevator Controls: Provide landing operating panels, landing indicator panels, and _____.
   1. Landing Operating Panels: Metallic type, one for originating "Up" and one for originating "Down" calls, one button only at terminating landings; with illuminating indicators.
   2. Landing Indicator Panels: Illuminating.
   3. Comply with ADA Standards for elevator controls.
   4. Controls to be card accessed from the landings.

B. Door Operation Controls:
   1. Program door control to open doors automatically when car arrives at floor landing.
   2. Render "Door Close" button inoperative when car is standing at dispatch landing with doors open.
   3. Door Safety Devices: Moveable, retractable safety edges, quiet in operation; equipped with photo-electric light rays.

2.06 OPERATION CONTROL TYPE

A. Single Automatic (Push Button) Operation Control: Applies to car in single elevator shaft.
   1. Refer to description provided in ASME A17.1.
   2. Set system operation so that momentary pressure of landing button dispatches car from other landing to that landing.
   3. Allow call registered by momentary pressure of landing button at any time to remain registered until car stops in response to that landing call.
   4. If elevator car door is not opened within predetermined period of time after car has stopped at terminal landing allow car to respond to call registered from other landing.

2.07 SERVICE CONTROL TYPE

A. Independent Service Control:
   1. Provide key operated "Independent Service" on car operating panel. Key activation will remove that car from normal operation and cancel pre-registered car calls.
   2. Car will respond to selected floor. Car will not respond to any calls from landing call buttons. Car will only respond to calls placed on the car operating panel. Doors will remain open at last landing requested. Doors will close with a constant pressure on "Door Close" button.
   3. Key activation to normal operation will return car to normal operation.

2.08 EMERGENCY POWER

A. Set-up elevator operation to run with elevator emergency power supply when the normal building power supply fails, and in compliance with ASME A17.1 requirements.

B. Elevator Emergency Power Supply: Supplied by battery backup; provide elevator system components as required for emergency power characteristics.

C. Emergency Lighting: Comply with ASME A17.1 elevator lighting requirements.

D. Provide operational control circuitry for adapting the change from normal to emergency power.

E. Upon transfer to emergency power, advance one elevator at a time to a pre-selected landing, stop car, open doors, disable operating circuits, and hold in standby condition.

2.09 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M), natural anodized finish unless otherwise indicated.

B. Resilient Flooring: Vinyl tile flooring and Sheet flooring, see Section 09 65 00, Type ___.

C. Plastic Laminate: NEMA LD 3, Type HGS, color as selected by Architect from manufacturer's standard line of colors.

2.10 CAR AND HOISTWAY ENTRANCES

A. Elevator, No. ___:
   1. Car and Hoistway Entrances, Main Elevator Lobby:
      a. Framed Opening Finish and Material: Alkyd enamel on steel.
      b. Car Door Material: Powder coat on steel, with rigid sandwich panel construction.
      c. Hoistway Door Material: Powder coat on steel, with rigid sandwich panel construction.

2.11 CAR EQUIPMENT AND MATERIALS

A. Elevator Car, No. ___:
   1. Car Operating Panel: Provide main and auxiliary; flush-mounted applied face plate, with illuminated call buttons corresponding to floors served with "Door Open/Door Close" buttons, "Door Open" button, "Door Close" button, alarm button, and _____.
      a. Panel Material: Integral with front return; one per car.
      b. Car Floor Position Indicator: Above door with illuminating position indicators.
      c. Locate alarm button where it is unlikely to be accidentally actuated; not more than 54 inch above car finished floor.
   2. Flooring: Resilient vinyl tile.
   3. Front Return Panel: Match material of car door.
   4. Door Wall: Plastic laminate on plywood.
   5. Hand Rail: Aluminum, at three side walls. Provide open clearance space 1-1/2 inch (38 mm) wide to face of wall.
      a. Aluminum Finish: Clear anodized.
   6. Ceiling:

2.12 FINISHES

A. Powder Coat on Steel: Clean and degrease metal surface; apply one coat of primer; two coats of powder coat.

B. Finish Paint for Metal Surfaces: Alkyd enamel, semi-gloss, color as selected, comply with VOC limitations of authorities having jurisdiction (AHJ).

C. Clear Anodized Finish: Class I, AAMA 611 AA-M12C22A41 Clear anodic coating with electrolytically deposited organic seal; not less than 0.7 mils, 0.0007 inch thick.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting this work.

B. Verify that hoistway, pit, machine room, and _____ are ready for work of this section.

C. Verify hoistway shaft and openings are of correct size and within tolerance.

3.02 PREPARATION

A. Maintain elevator pit excavation free of water.

3.03 INSTALLATION

A. Coordinate this work with installation of hoistway wall construction.

B. Install system components, and connect equipment to building utilities.

C. Provide conduit, electrical boxes, wiring, and accessories; see Sections 26 05 33.13 and 26 05 83.

D. Mount machines, motors, and _____ on vibration and acoustic isolators.
   1. Place on structural supports and bearing plates.
   2. Securely fasten to building supports.
   3. Prevent lateral displacement.

E. Install hoistway, elevator equipment, and components in accordance with approved shop drawings.

F. Install guide rails to allow for expansion and contraction movement of guide rails.

G. Accurately machine and align guide rails, forming smooth joints with machined splice plates.

H. Install hoistway door sills, frames, and headers in hoistway walls; grout sills in place, set hoistway floor entrances in alignment with car openings, and align plumb with hoistway.

I. Structural Metal Surfaces: Clean surfaces of rust, oil or grease; wipe clean with solvent; prime with two coats.

J. Wood Surfaces not Exposed to Public View: Finish with one coat primer; one coat enamel.

K. Adjust equipment for smooth and quiet operation.

3.04 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements for additional requirements.

B. Perform testing and inspection in accordance with requirements.

C. Operational Tests:
   1. Perform operational tests in the presence of Owner and Architect.
   2. At an agreed time, and the building occupied with normal building traffic, conduct tests to verify performance.
      a. Furnish event recording of each landing call registrations, time initiated, and response time throughout entire working day.
   3. Set period of time elevator takes to travel between typical floor landings at not more than ____ seconds.
      a. Measure time from moment doors start to close until car has stopped level at next floor landing and doors are opening.

3.05 ADJUSTING

A. Adjust for smooth acceleration and deceleration of car to minimize passenger discomfort.

B. Adjust with automatic floor leveling feature at each floor landing to reach 1/4 inch maximum from flush with sill.

3.06 CLEANING

A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.

B. Remove protective coverings from finished surfaces.

C. Clean surfaces and components in accordance with manufacturers written instructions.

3.07 CLOSEOUT ACTIVITIES

A. Demonstrate proper operation of equipment to Owner's designated representative.

B. Demonstration: Demonstrate operation of system to Owner's personnel.
   1. Use operation and maintenance data as reference during demonstration.
   2. Briefly describe function, operation, cleaning and maintenance of each component.

C. Training: Train Owner's personnel on cleaning and operation and maintenance of system.
   1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
   2. Provide minimum of two hours of training.

3.08 PROTECTION

A. Do not permit construction traffic within car after cleaning.

B. Protect installed products until Date of Substantial Completion.

C. Touch-up, repair, or replace damaged products and materials before Date of Substantial Completion.

3.09 MAINTENANCE

A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements relating to initial maintenance service.

B. Submit proposal for continuation of Maintenance Contract in accordance with ASME A17.1 and requirements as indicated for installed elevator equipment.

END OF SECTION 14 21 00