

PROJECT MANUAL

FOR

**BURBANK HIGH SCHOOL
New Storage Building with Bleacher Seating**

At

BURBANK UNIFIED SCHOOL DISTRICT

Prepared by:

FLEWELLING & MOODY

Architecture planning interiors

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Flewelling & Moody Project No. 2986.0100

DSA# 03-123187; File# 19-H4

December 13, 2022

PROJECT DIRECTORY

Burbank High School – New Storage Building & Bleacher Seating with Shade Structure

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(DISTRICT OFFICE)**

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END OF SECTION

**PROJECT MANUAL
FOR
BURBANK HIGH SCHOOL
NEW STORAGE BUILDING & BLEACHER SEATING
WITH SHADE STRUCTURE
AT
BURBANK UNIFIED SCHOOL DISTRICT
Burbank, California**

Prepared by
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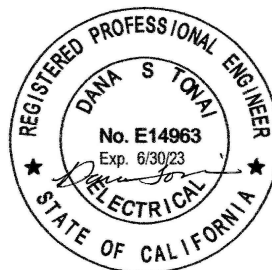
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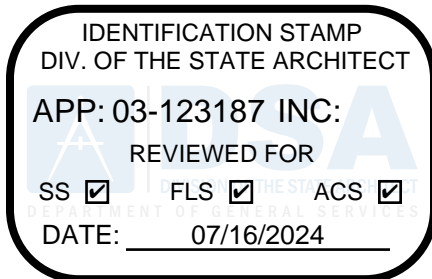
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Flewelling & Moody, Inc.
Project No. 2986.100

**SECTION 00 00 10
TABLE OF CONTENTS**

DIVISION 0 – GENERAL INFORMATION

00 00 01	Cover Page
00 00 02	Project Directory
00 00 05	Signature Page
00 00 10	Table of Contents

DIVISION 01 – GENERAL REQUIREMENTS

01 10 01	Summary of Work
01 10 30	Project Procedures
01 10 45	Cutting and Patching
01 10 60	Regulatory Requirements
01 31 00	Project Management and Coordination
01 32 16	Construction Schedule
01 33 00	Submittal Procedures
01 42 00	References
01 43 00	Quality Control
01 45 29	Testing and Inspection
01 50 00	Temporary Facilities and Controls
01 60 20	Storage and Protection
01 77 00	Closeout Procedures
01 77 01	Project Closeout
01 77 20	Project Record Documents
01 77 40	Warranties
01 78 23	Operation and Maintenance Manuals

DIVISION 02 – EXISTING CONDITIONS

02 41 19	Demolition
----------	------------

DIVISION 03 – CONCRETE

03 10 00	Concrete Forming and Accessories
03 20 00	Concrete Reinforcement
03 30 00	Cast-In-Place Concrete

DIVISION 04 – MASONRY

04 22 00	Concrete Unit Masonry
----------	-----------------------

DIVISION 05 – METALS

05 12 00	Structural Steel
05 30 00	Metal Decking
05 50 00	Metal Fabrications
05 55 00	Miscellaneous Metals

DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES

06 10 00	Rough Carpentry
----------	-----------------

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

07 26 00	Underslab Vapor Barrier
07 41 13	Preformed Metal Standing Seam Roofing

07 55 00	Modified Bituminous Membrane Roofing
07 57 00	DEX FLEX Traffic Coating System
07 60 00	Flashing and Sheet Metal
07 63 10	Gutters and Downspouts
07 92 00	Joint Sealants

DIVISION 08 – DOORS AND WINDOWS

08 11 13	Hollow Metal Doors and Frames
08 33 00	Roll Up Service Door
08 71 00	Door Hardware
08 80 00	Glazing

DIVISION 09 – FINISHES

09 24 00	Portland Cement Plaster
09 90 00	Painting

DIVISION 10 – SPECIALTIES

10 14 00	Identifying Devices
----------	---------------------

DIVISION 11 – EQUIPMENT

Not Used

DIVISION 12 – FURNISHINGS

Not Used

DIVISION 14 – CONVEYING SYSTEMS

14 42 00	Wheelchair Lifts
----------	------------------

DIVISION 21 – FIRE SUPPRESSION

Not used

DIVISION 27 – COMMUNICATIONS

27 51 23	Assistive Listening System
----------	----------------------------

DIVISION 23 – HEATING, VENTILATING AND AIR CONDITIONING (HVAC)

Not Used

DIVISION 31 – EARTHWORK

31 10 00	Site Clearing
31 20 00	Earthwork
31 23 33	Trenching and Backfilling

DIVISION 32 – EXTERIOR IMPROVEMENTS

32 12 16	Asphalt Concrete Paving
32 16 00	Curbs, Gutters, Sidewalks

DIVISION 33 – UTILITIES

33 40 00	Storm Drainage Utilities
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END OF SECTION

**SECTION 01 10 00
SUMMARY OF WORK**

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and drawing conventions.

B. Related Section:

1. Division 01 50 00 Section "Temporary Facilities & Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.2 PROJECT INFORMATION

A. Project Identification: Burbank High School Library

1. Project Location: 902 North Third Street, Burbank, CA 91502

B. Owner: Burbank Unified School District

1. Owner's Representative: Dennis Maxwell

C. Architect: Flewelling & Moody.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of the Project is defined by the Contract Documents and consists of the following:

1. Architectural and Structural alterations to an existing wood framed building on concrete foundations.
2. Interior improvements consist of non-bearing partition walls, rooms, ceilings, floors, and finishes.
3. Alterations of existing building systems and distribution of new mechanical, plumbing, electrical, and fire alarm system.
4. On site improvements consist of new pavement areas and retaining walls.

5. Path of travel and signage improvements as per 2019 CBC 11B-202.4

B. Type of Contract.

1. Project will be constructed under Design – Bid – Build.

1.4 ACCESS TO SITE

A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

B. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Limits: Limit site disturbance; 10 feet (3 m) beyond surface walkways, patios, surface parking, and utilities less than 12 inches (300 mm) in diameter; 15 feet (4.5 m) beyond primary roadway curbs and main utility branch trenches; and 25 feet (7.6 m) beyond constructed areas with permeable surfaces (such as pervious paving areas, storm water detention facilities, and playing fields) that require additional staging areas in order to limit compaction in the constructed area.

2. Driveways, Walkways and Entrances: Keep driveways loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

a. Schedule deliveries to minimize use of driveways and entrances by construction operations.

b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

1.5 COORDINATION WITH OCCUPANTS

A. Partial Owner Occupancy: Owner will partially occupy the premises during entire construction period. Adjacent site is commercial and residential area. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.

2. Provide not less than 72-hour notice to Owner of activities that will affect Owner's operations.

B. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.

1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.6 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 1. Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building to normal business working hours as regulated by the City of Burbank.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 1. Notify Owner not less than two days in advance of proposed utility interruptions.
 2. Obtain Owner's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
 1. Notify Owner not less than two days in advance of proposed disruptive operations.
 2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Nonsmoking Campus: Smoking is not permitted within the campus.
- F. Controlled Substances: Use of tobacco products and other controlled substances on the Project site is not permitted.

1.7 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on the Drawings are described in detail in the Specifications. One or more of the following are used on the Drawings to identify materials and products:
1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

**SECTION 01 10 30
PROJECT PROCEDURES**

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Work included: This section establishes special project procedures regarding
 - 1. Documents and bid procedures;
 - 2. Protection of existing facilities;
 - 3. Limits of work and storage areas;
 - 4. Construction controls;
 - 5. Coordination;

1.2 QUALITY ASSURANCE

- A. Perform all work in strict accordance with pertinent requirements of these Specifications and, in the event no such requirements are determined, in conformance with the Architect's written direction.

1.3 SUBMITTALS

- A. None required.

PART 2 – PRODUCTS

2.1 GENERAL

- A. It is the intent of these Specifications and other Contract Documents to provide a complete workable design in all parts; any equipment shown or specified shall be furnished and installed with all accessories, controls, power, and full connections as may be necessary to assure safe and proper installation and operation.

2.2 PRECEDENCE

- A. The Contract and each of the Contract Documents are complementary and they shall be interpreted so that what is called for in any one shall be as binding as if called for in all.
- B. If there is a conflict between these Technical Specifications and any remaining portion of the bid, the provisions requiring the most expensive or elaborate method of work, materials, or equipment shall control. Items in direct conflict, discovered during the bid, should be brought to the attention of the Architect, for clarification, by written Addenda. If clarification and/or Addenda is unable to be issued, the bidders shall bid the more expensive of the conflicting items/conditions; this provision shall govern the entire scope of this contract. Following Award of Bid, should the District elect to utilize the cheaper or less elaborate condition, a credit change Order shall be issued. Refer to related information in the General and Special Conditions. Contractor shall secure written permission from Architect before proceeding with work affected by omission or discrepancies in the Contract.
- C. Separate sections of this Specification are arranged only for convenience of Contractor, and nothing stated herein should be misconstrued as suggesting jurisdiction over items of work by any different building trades.
- D. When Agreement is signed, the Contractor will be given copies of the Architect's original plans and CAD disk to make one (1) set of reproducible sepias and one (1) as-built CAD Disk, the cost to be funded by the Bidder's General Conditions. All drawing print sets required by the

awarded firm, subcontractors and suppliers shall be included. This sepia and CAD disk set will also be used for the "as-built" drawings as referenced in Section 01720, Project Record Documents. A complete As-Built submission shall consist of the sepia's and the CAD disk.

PART 3 – EXECUTION

3.1 CARE OF PRESENT BUILDINGS AND GROUNDS

- A. Contractor shall be held responsible, so far as his operations are concerned, for the care and preservation of the adjacent premises, utilities, walks, streets and co-terminus property. Any parts of them injured, damaged, or disturbed because of his work shall be repaired, replaced, or cleaned, at Contractor's expense, to the satisfaction of District Representative. Prior to commencement of the Work, the Contractor or his designated representative shall jointly review the site as a part of the Pre-Construction Conference.
- B. Any such facilities as existing roads, curbing, utility poles, or underground utility lines damaged by Contractor in execution of this Contract shall be restored to former condition by Contractor at no change in the Contract price to satisfaction of District.
- C. Contractor shall take all precautions and care to preserve and protect all trees and shrubs in the right-of-ways and on the property. No tree or trees shall be cut or felled without specific permission in writing from the Architect. Trees cut without explicit instructions do so shall be replaced at the expense of the Contractor.
- D. No pruning of trees is to be done except by specified instructions of the District. Soil within the spread of the tree branches shall not be disturbed. Advance notice shall be given to the District if roots of a diameter greater than 1" must be cut.
- E. Contractor shall record and submit to District for verification any damage prior to commencement of work. Any damage not recorded and verified by District is the responsibility of the Contractor to correct.

3.2 LIMITS OF WORK AND STORAGE AREAS

- A. Submit for Construction Manager's approval a site utilization plan for construction. Plans shall indicate limits of work, storage areas, and truck routes.

3.3 CONSTRUCTION CONTROLS

- A. Dust palliation: In addition to cleanup provisions of the Specifications, Contractor shall take appropriate steps during and throughout term of the Project to prevent airborne dust due to work under this Contract. Water shall be applied to settle and prevent dust, particularly during excavation and moving of materials. No chemical palliatives shall be used without permission of the District.
- B. Noise control: Noise from job equipment shall be kept to a minimum by adequate mufflers and other means as approved by Architect or Construction manager.
- C. Interruptions of existing services shall be held to minimum and shall be made only at such times as the District directs. Approval of the District shall be requested at least 3 days in advance of desired interruption time. **Contractor shall be responsible for full Utility service to be maintained at all times to the adjacent buildings.**

3.4 SPECIAL COORDINATION REQUIREMENT

- A. It is possible that the District might have various projects under different contracts in progress simultaneously in areas adjacent to, or coincident with, areas involved in the Project.
- B. Contractor shall be responsible to coordinate the work with that of other contractors' work to allow access to sites and to avoid rework and damages to new work.

- C. Contractor shall submit a detailed critical-path schedule for District's approval before beginning work and shall make such changes in this schedule as required by District in order to assure smooth and proper execution of all works.

3.5 VERIFICATION OF EXISTING UTILITIES

- A. Prior to constructing any new underground utility, the Contractor shall expose and verify all existing underground facilities that may conflict with the new utility, to ensure accuracy of the information shown on the Drawings.

3.6 HAZARDOUS MATERIALS

- A. Should asbestos, PCB or other hazardous materials be encountered in any area, immediately stop all work in that area and notify the District's representative; the District will remove all hazardous material, clean the area, and have it certified as safe by a Certified Industrial Hygienist before work under this contract may proceed in that area. A time extension will be granted for delay caused by this cleanup.
- B. Non-Specified asbestos removal from buildings shall be done under separate contract by the District.

3.7 ADDENDA AND CHANGE ORDER

- A. Changes in the Plans and Specifications shall be made by Addenda and Change Orders approved by the Division of the State Architect. Minor modifications, as determined by the District, may be made to the Plans and Specifications in writing accompanied with the Architect's signature without the processing of a formal Change Order.

3.8 ACCESS PANELS

- A. Access panels are referenced in separate sections for different trades (mechanical, plumbing, electrical). It shall be the responsibility of the individual trades to provide the access panels (sized accordingly) required for their installations. Coordinate exact location with Construction Manager prior to installation.

3.9 FIRESAFETY DURING DEMOLITION

- A. Demolition of buildings shall be in accordance with Section 8706 and, where applicable, Sections 8704 and 8705 of the California Fire Code, most recent addition.
- B. Suitable fire hose, shall be maintained at the demolition site. Such hose shall be connected to an approved source of water and shall not impede fire department use of hydrants.
- C. Demolition operations involving cutting and welding shall be in accordance with Section 4907, C.F.C.
- D. Combustible waste material, trash and rubbish shall not be burned at the demolition site, unless approved. Accumulations of such material shall be removed from the site as often as necessary to minimize the hazards therefrom.
- E. When required by the District, for building demolition which is hazardous in nature, qualified personnel shall be provided to serve as on-site fire watch. The sole duty of fire watch personnel shall be to watch for the occurrence of fire.

3.10 FIRE SAFETY DURING CONSTRUCTION

- A. Buildings under construction shall be in accordance with Section 8704 of the California Fire Code, most recent edition.

- B. Fire department access roads shall be established and maintained in accordance with Section 902, C.F.C.
- C. Water mains and hydrants shall be installed and operational in accordance with Section 903.
- D. During the construction of a building and until the permanent fire-extinguishing system has been installed and is in service, fire protection shall be provided in accordance with Section 8704, C.F.C.
- E. Fire extinguishers shall be provided for the buildings under construction. The number and type of extinguishers and the type of extinguisher shall be suitable for the type of fire associated with the hazards present.
- F. Combustible Debris. Combustible debris shall not be accumulated within buildings. Combustible debris, rubbish and waste material shall be removed from building as often as practical. Combustible debris, waste material and trash shall not be burned on the site unless approved.
- G. Internal-combustion-powered construction equipment shall be used in accordance with the following:
 - 1. Equipment shall be located so that exhausts do not discharge against combustible material.
 - 2. When possible, exhausts shall be piped to the outside of the building.
 - 3. Equipment shall not be refueled while in operation.
 - 4. Fuel for equipment shall be stored in an approved area outside of the building.
- H. Temporary heating devices shall be located away from combustible materials, and attended and maintained by competent personnel.
- I. Smoking shall be prohibited. A suitable number and type of NO SMOKING signs shall be posted.
- J. Cutting and welding operations shall be in accordance with Article 49, C.F.C.
- K. The use of torched or flame-producing devices for the sweating of pipe joints shall be in accordance with Section 1109.3.2, C.F.C.
- L. The storage, use and handling of flammable liquids shall be in accordance with Article 79. Ventilation shall be provided for operation utilizing the application of materials containing flammable solvents.
- M. Open-flame devices and other sources of ignition shall not be located in areas where flammable materials are being used.
- N. Asphalt and tar kettles shall be located and operated in accordance with Section 1105, C.F.C.
- O. Temporary electrical wiring shall be in accordance with Section 8503, C.F.C.
- P. When required by the chief, access to buildings for the purpose of fire-fighting shall be provided. Construction material shall not block access to buildings, hydrants or fire appliances.
- Q. Telephone facilities shall be provided at the construction site for the purpose of emergency notification of the fire department. The street address of the construction site shall be posted adjacent to the telephone together with the fire department telephone number.
- R. A fire-protection plan shall be established by the Shell, Electrical and HVAC Contractors for each school site.

3.11 REQUESTS FOR INFORMATION AND OTHER OFFICIAL CONTRACT CORRESPONDENCE

- A. Requests for Information (and/or Clarification) (hereinafter referred to as "RFI's") submitted by the Contractor to the District shall contain the following:
1. Sequential RFI number.
 2. Date.
 3. Project Title and Information.
 4. Statement whether sent via facsimile only and/or hard copy to follow. It is acceptable to send a facsimile copy only; it is acceptable for the District to send a facsimile response only.
 5. Addressed to the District.
 6. Plan Sheet Reference and/or Spec. Section Reference including additional detail as required, such as column grid reference, or Part/Paragraph section of the Specification.
 7. Bold Reference citing the "Description of the Scope in Question" such as: "Ceiling Height in Classroom B123, Duct Clearances".
 8. A complete, concise question regarding the issue. Note: If sketches, or other documentation, are attached, a reference shall be provided alluding to these attachments. If the RFI is originated from a subcontractor, this shall be noted.
 9. The date the answer is needed by so as not to impact schedule. Note: The Contractor shall allow a minimum of 5 working days for each RFI.
 10. If a "yes" answer, or some such similar answer, would impact the contract schedule, this shall be noted.
 11. If there is a potential cost/credit impact to the District's answer, this shall be noted. Failure to notify the Construction manager at the time of the RFI may waive the Contractor's rights to such future claim.
 12. The signature of the Contractor or Contractor's superintendent.
 13. An area with printed lines for the District's response.
 14. A space for the Project Manager's signature and date.
 15. The Contractor's field office facsimile number printed on the RFI.
- B. The Contractor shall not submit more than six (6) RFI's in any one day, or more than twenty-four (24) RFI's in any one working week. It shall be the Contractor's responsibility to study the plans and specifications, in conjunction with his subcontractors, far enough in advance to submit the RFI's so as to not have an adverse impact upon the project sequencing or schedule.
- C. The Construction Manager shall be responsible for the distribution of all RFI's, once they have been answered by the Architect, in an appropriate and final manner, to all applicable trade contractors. The Architect shall make initial distribution to the District, Inspector of Record, Construction Manager, as well as to her own consultants and engineers.
- D. The Construction Manager shall maintain an RFI log, and distribute the log, showing current status at each project meeting. The Construction Manager shall maintain a bound file of all the RFI's, with the District's response, including all applicable attachments, in the job trailer at all times during the project.

1. When applicable, all Contractors shall attach an RFI response to the Master Project Construction Set, at the appropriate location in the plans and/or specifications, if the answer affects, revises, or provides necessary clarification to the construction issue in question.
- E. Proposal Requests: When the Contractor has notified the Construction Manager that the response is generating either a potential cost or credit to the contract, the Construction Manager shall issue a proposal request to the Contractor, and copy all applicable parties.
1. When the costs and/or credits have been submitted properly for the work in question, and have been reviewed by the District and Construction Manager, and the cost(s) and/or credits have been agreed upon, the Construction Manager will then assign the item to the next change order in the billing cycle.
- F. Frivolous RFI's: The RFI format shall not be used for the following:
1. A method for getting the Construction Manager or Architect to perform the Contractor's duties of properly reviewing and coordinating the plans and specifications. The Contractor is asked to use discretion in submitting RFI's; simple questions can be solved by teleconference with the Construction Manager, or bringing up questions at the weekly meetings. The Construction Manager will work with the Contractor in defining what constitutes the difference.
 2. The method for getting the District to answer a subcontractor's question that normally is part of the trade bid Contractor's responsibility.
 3. A method for attempting to create additional cost to the contract where no additional cost is due.
 4. A method for luring to District into providing an answer clearly different than the documents require.
 5. In the event that the Contractor is deemed to be abusing the RFI process, the Construction Manager reserves the right to "back-charge" the contract, per his standard hourly rates, as a credit in dollars to be applied to contract extra costs.
- G. Status of District's Responses to RFI's: The Architect's written response, when applicable, shall be incorporated into the contract as the most current ruling or interpretation of the plans and specifications.
- H. Bulletins: "Bulletins" issued by the Architect, whether or not generated by an RFI, shall become official contract correspondence and incorporated into the contract. If necessary, and subject to the agreement of all parties, Bulletin issues may lead into a Proposal Request and Change Order.

END OF SECTION

**SECTION 01 10 45
CUTTING AND PATCHING**

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section establishes general requirements pertaining to cutting (including excavating), fitting, and patching of the Work required to:
 - 1. Make the several parts fit properly;
 - 2. Uncover work to provide for installing, inspecting, or both, of ill-timed work;
 - 3. Remove and replace work not conforming to requirements of the Contract Documents; and
 - 4. Remove and replace defective work.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
 - 2. In addition to other requirements specified, upon the District's request uncover work to provide for inspection by the District of covered work, and remove samples of installed materials for testing.
 - 3. Do not cut or alter work performed under separate contracts without the District's written permission.

1.2 SUBMITTALS

- A. Request for District's consent:
 - 1. Prior to cutting which affects structural safety, submit written request to the Project Architect for permission to proceed with cutting.
 - 2. Should conditions of the Work, or schedule, indicate a required change of materials or methods for cutting and patching, so notify the Project Architect and secure his written permission and the required Change Order prior to proceeding.
- B. Notices to the Architect:
 - 1. Prior to cutting and patching performed pursuant to the District's instructions, submit cost estimate to the Architect. Secure the Project Architect approval of cost estimates and type of reimbursement before proceeding with cutting and patching.
 - 2. Submit written notice to the Project Architect designating the time the work will be uncovered, to provide for the District's observation.

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen thoroughly trained and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. For replacement of items removed, use materials complying with pertinent Sections of these Specifications.

2.2 PAYMENT FOR COSTS

- A. The Owner will reimburse the Contractor for cutting and patching performed pursuant to a written Change Order, after claim for such reimbursement is submitted by the Contractor. Perform other cutting and patching needed to comply with the Contract Documents at no additional cost to the Owner.

PART 3 – EXECUTION

3.1 SURFACE CONDITIONS

- A. Inspection:
 - 1. Inspect existing conditions, including elements subject to movement or damage during cutting, excavating, patching, and backfilling.
 - 2. After uncovering the work, inspect conditions affecting installation of new work.
- B. Discrepancies:
 - 1. If uncovered conditions are not as anticipated, immediately notify the Architect and secure needed directions.
 - 2. Do not proceed until unsatisfactory conditions are corrected.

3.2 PREPARATION PRIOR TO CUTTING

- A. Provide required protection including, but not necessarily limited to, shoring, bracing, and support to maintain structural integrity of the Work.

3.3 PERFORMANCE

- A. Perform required excavating and backfilling as required under pertinent other Sections of these Specifications and OSHA standards for such work.
 - 1. Perform cutting and demolition by methods which will prevent damage to other portions of the Work and provide proper surfaces to receive installation of repair and new work.
 - 2. Perform fitting and adjusting of products to provide finished installation complying with the specified tolerances and finishes.
 - 3. Typically chip back existing adjoining plaster surfaces to expose the lath and building paper to permit proper lapping on new infill materials.

END OF SECTION

**SECTION 01 10 60
REGULATORY REQUIREMENTS**

PART 1 – GENERAL

1.1 SECTION INCLUDES:

- A. This Section sets forth certain codes and standards and relevant requirements applicable to the work required under this contract.

1.2 STATUTORY AND JURISDICTIONAL REGULATIONS

A. State of California Code of Regulation and Amendments:

1. Title 24 – Industrial Relations; Safety Orders.
2. Current Federal ADA Guidelines
3. 2019 Building Standards Administrative Code, Title 24 C.C.R.
4. 2019 California Building Code (CBC), Title 24 C.C.R.; (2018 International Building Code of the International Code Council, with California Amendments)
5. 2019 California Electrical Code (CEC), Title 24 C.C.R.; (2016 National Electrical Code of the National Fire Protection Association, NFPA with California Amendments)
6. 2019 California Mechanical Code (CMC), Title 24 C.C.R.; (2018 IAPMO Uniform Mechanical Code with California Amendments)
7. 2019 California Plumbing Code (CPC), Title 24 C.C.R.; (2015 Edition IAPMO Uniform Plumbing Code with California Amendments)
8. 2019 Energy Code (CEC), Title 24 C.C.R.
9. 2019 California Historical Building Code, Title 24, C.C.R
10. 2019 California Fire Code (CFC), Title 24, C.C.R. (2018 International Fire Code of the International Code Council with California Amendments).
11. 2019 California Existing Building Code, Title 24 C.C.R (2018 International Existing Building Code of the International Code Council with California Amendments).
12. 2019 California Green Building Standards Code (CalGreen) Title 24, C.C.R
13. 2019 California Referenced Standards Code, Title 24, C.C.R.
14. 2019 California Public Safety, State Fire Marshal Regulations, Title 19, C.C.R.

B. List of Applicable NFPA Standards:

1. NFPA 253 Critical Radiant Flux of Floor Covering Systems 2019 Edition
2. NFPA 2001 Clean Agent Fire extinguishing Systems 2015 Edition
Reference code section for NFPA Standards – CBC (SFM) 3504.1

3.	NFPA 13	Automatic Sprinkler Systems	2016 Edition
4.	NFPA 14	Standpipe Systems	2013 Edition
5.	NFPA 17	Dry Chemical Extinguishing Systems	2013 Edition
6.	NFPA 17A	Wet Chemical Extinguishing Systems	2013 Edition
7.	NFPA 20	Stationary Pumps	2013 Edition
8.	NFPA 24	Private Fire Service Mains	2016 Edition
9.	NFPA 72	National Fire Alarm Code (California Amended) (Note see UL Standard 1971 for "Visual Devices")	2016 Edition
10.	NFPA 80	Fire Door & Windows	2016 Edition

C. Construction Safety

1. Statutory and jurisdictional requirements as applicable to temporary work, including California Construction Safety Orders.
2. Associated General Contractors of America, Inc., Manual of Accident Prevention.
3. OSHA, Occupational Safety and Health Agencies requirements.

1.3 GENERAL STANDARDS FOR WORK AND MATERIALS

- A. Work or materials specified by reference to a number, symbol or title of a specific standard - - such as ASTM, U.L., F.S., or other standards - - shall comply with requirements thereof, except as limited to type, class, grade or modifications shown or specified.
- B. Referenced standards shall have full force and effect as though printed herein and are not repeated for reasons that manufacturers and Contractors are assumed to be familiar with requirements governing or applicable to their work. Upon request, Architect will furnish information as to where copies may be obtained.
- C. Material or trade associations, societies, or other bodies regularly publishing standards most widely used under these documents are listed herein together with reference symbols.
- D. Individual standards are referred to under Technical Sections by said reference symbol followed by designation number.

A.A.	The Aluminum Association
AASHO	American Association of the State Highway and Transportation Officials
ACI	American Concrete Institution
AGA	American Gas Association
AISC	American Institute for Steel Construction
ANSI	American National Standards Institute
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing and Materials
AWS	American Welding Society

AWWA	American Water Works Association
CS	Commercial Standards, U.S. Department of commerce
FGMA	Flat Gas Marketing Society
FML	Factory Mutual Laboratories
F.S.	Federal Specifications
GA	Gypsum Association
IEEE	Institute of Electrical and Electronic Engineers
MFMA	Maple Flooring Manufacturer's Association
M.S.	Military Specifications U.S. GSA
NAAMM	National Association of Architectural Metal Manufacturers
NBS	National Bureau of Standards
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association
PCA	Portland Cement Association
PS	Product Standard, U.S. Department of Commerce
RIS	Redwood Inspection Service
SDI	Steel Door Inspections
SMANCA	Sheet Metal and Air Conditioning Contractor's National Association
TCA	Tile Council of America
UL	Underwriter's Laboratories, Inc.
WCLIB	West Coast Lumber Inspection Bureau
WIC	Wood Work Institute of California
WWPA	Western Wood Products Association

E. Book of Standards

1. State of California, Business and Transportation Agency, Department of Transportation.
 - a. CALIFORNIA STANDARD SPECIFICATIONS: Standard Specifications, January 1988, specific parts referred to by Section number.
 - b. CALIFORNIA TEST METHOD: Methods and Research Dept., Materials manual, 1988; specific tests referred to by California number.
2. APWA Standard Specifications: American Public Works Association, No. California Chapter, Standard Specifications for Public Works Construction, 2000 Edition; specific parts referred to by APWA Section number 3 U.L.; Underwriters' Laboratories Inc.; Buildings Materials List, 2001 or latest edition; and others regularly published; specific parts referred to by U.L. Classification Title and number.

1.4 FIRE RATED WORK OR MATERIAL

- A. Applicable to materials, construction or fabrication specified or required to have limited fire hazard characteristics.
- B. Materials or assemblies shall be tested and classified per applicable ASTM Test Methods; or comparable scientific testing establishing like valuations, under sponsorship of manufacturer and conducted by U.L. or other established testing agency regularly performing tests of a type required.
 1. Testing standards, methods and procedures shall be subject to approval by California State Fire Marshall having jurisdiction.
 2. Flame spread of materials used, when installed under the conditions shown or specified, shall not exceed characteristic values specified.

3. Compliance shall be substantiated by written certificate, labeling or both as specified.
 - C. Wood: Refer to Division 6.
 - D. Electrical: Refer to division 16.
 - E. ASTM Tests not otherwise identified shall be listed under ASTM publication titled 2000 Annual Book of ASTM Standards, Section 00 under section of subject index, and under subject headings Fire Tests, and Flammability Tests.
- 1.5 MANUFACTURER'S STANDARDS
- A. Applicable to type of items and products.
 - B. Instructions not otherwise shown or specified shall be those of producer, as applicable, covering:
 1. Primary materials, auxiliary materials and accessories.
 2. Conditions of handling and for storage and protection.
 3. Preparation of backup surfaces.
 4. Installation, cleaning and maintenance procedures.
 - C. Publications of procedures shall apply as particularly referred to, otherwise as regularly provided by producer, and shall include generalized installation publications or instructions.

PART 2 – PRODUCTS
NOT USED

PART 3 – EXECUTION
NOT USED

END OF SECTION

SECTION 01 31 00
PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. Coordination drawings.
 - 2. Requests for Information (RFIs).
 - 3. Project meetings.

1.2 DEFINITIONS

- A. RFI: Request from Owner, Architect, or Contractor seeking information from each other during construction.

1.3 COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required obtaining the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's construction schedule.
 - 2. Preparation of the schedule of values.

3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Pre-installation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.
9. Project closeout activities.

1.4 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings in accordance with requirements in individual Sections, where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
 1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - b. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:
 1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire protection, fire alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid.
 2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings.
 3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire protection, fire alarm, and electrical equipment.
 4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
 5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.

6. Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are the Contractor's responsibility.

1.5 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 1. Project name.
 2. Project number.
 3. Date.
 4. Name of Contractor.
 5. Name of Architect.
 6. RFI number, numbered sequentially.
 7. RFI subject.
 8. Specification Section number and title and related paragraphs, as appropriate.
 9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Contractor's signature.
 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
- C. RFI Forms: AIA Document G716 or Software-generated form with substantially the same content as indicated above, acceptable to Architect.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
 1. The following RFIs will be returned without action:

- a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for coordination information already indicated in the Contract Documents.
 - d. Requests for adjustments in the Contract Time or the Contract Sum.
 - e. Requests for interpretation of Architect's actions on submittals.
 - f. Incomplete RFIs or inaccurately prepared RFIs.
- 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
 - 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 1 Section "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect and Owner's Project Manager in writing within **10** days of receipt of the RFI response.
- E. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect and Owner's Project Manager within seven days if Contractor disagrees with response.
 - F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly.
 - 1. Project name.
 - 2. Name and address of Contractor.
 - 3. Name and address of Architect.
 - 4. RFI number including RFIs that were dropped and not submitted.
 - 5. RFI description.
 - 6. Date the RFI was submitted.
 - 7. Date Architect's response was received.
 - 8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 - 9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.6 PROJECT MEETINGS

- A. General: Architect will schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, and Architect, within three days of the meeting.
- B. Preconstruction Conference: Architect will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than **15** days after execution of the Agreement.
1. Attendees: Authorized representatives of Owner, Architect, Contractor and its superintendent. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Procedures for processing field decisions and Change Orders.
 - f. Procedures for RFIs.
 - g. Procedures for testing and inspecting.
 - h. Procedures for processing Applications for Payment.
 - i. Distribution of the Contract Documents.
 - j. Submittal procedures.
 - k. Sustainable design requirements.
 - l. Preparation of record documents.
 - m. Use of the premises and existing building.
 - n. Work restrictions.
 - o. Working hours.
 - p. Owner's occupancy requirements.
 - q. Responsibility for temporary facilities and controls.
 - r. Procedures for moisture and mold control.
 - s. Procedures for disruptions and shutdowns.

- t. Construction waste management and recycling.
 - u. Parking availability.
 - v. Office, work, and storage areas.
 - w. Equipment deliveries and priorities.
 - x. First aid.
 - y. Security.
 - z. Progress cleaning.
3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
- 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect, and Owner's Project Manager, of scheduled meeting dates.
 - 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility problems.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer's written recommendations.
 - n. Warranty requirements.
 - o. Compatibility of materials.

- p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: Architect will conduct progress meetings at weekly intervals.

1. Attendees: Representative of Owner, Architect and Contractor. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.

- 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Progress cleaning.
 - 10) Quality and work standards.
 - 11) Status of correction of deficient items.
 - 12) Field observations.
 - 13) Status of RFIs.
 - 14) Status of proposal requests.
 - 15) Pending changes.
 - 16) Status of Change Orders.
 - 17) Pending claims and disputes.
 - 18) Documentation of information for payment requests.
3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 32 16
CONSTRUCTION SCHEDULE

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Work included: Construction Schedule procedures, preparation, submittal, updates, and revisions.

1.2 QUALITY ASSURANCE

- A. Perform all work in strict accordance with pertinent requirements of these Specifications and in the event no such requirements are determined, in conformance with the Architect's written direction.

1.3 SUBMITTALS

- A. The construction of this project will be planned and recorded with a conventional Critical Path Method (CPM) schedule. The schedule shall be used for coordination, monitoring, and payment of all work under the contract including all activity of subcontractors, vendors, suppliers, and for all submittals.
- B. Contractor is responsible for preparing the schedule. All costs incurred by Contractor in preparing the schedule shall be borne by Contractor as a part of its responsibility under this contract.

1.4 PROCEDURES

- A. Baseline Construction Schedule
 - 1. Before proceeding with any work on site, Contractor shall prepare, submit, and receive District's approval of a Baseline Construction Schedule. This schedule shall provide a detailed breakdown of activities scheduled for the first 90 days of the project and shall include mobilization, submittals, procurement, and construction.
 - 2. No contact work may be pursued at the site without an approved Baseline Construction Schedule or an approved CPM schedule.
- B. Within forty-five (45) calendar days after date of Notice to Proceed, Contractor shall submit, for review, a Detailed Project Schedule setting forth all requirements for complete execution of work.
- C. Preparation of Detailed Project Schedule
 - 1. The construction time, for the entire project or any milestone, shall not exceed the specified contract time. In the event that any milestone date or contract completion date is exceeded in the schedule, logic and/or time estimates will be revised.
 - 2. Following the District's review, if revisions to the proposed schedule are required, the Contractor shall do so promptly. The schedule must be finalized within 60 days of the Notice to Proceed. Failure to finalize the schedule by that date will result in withholding all contract payments until the schedule is finalized.
- D. Simultaneously with each submittal of Progress Payment Request, Contractor shall deliver to the District an updated Detailed Project Schedule reflecting work progress as of end of previous reporting period. Each such Schedule shall indicate actual progress to date in execution of work, together with a projected schedule for completion of work.

- E. All Schedule submittals are subject to review and acceptance by the District. The District shall withhold progress payments until Contractor submits a Detailed Project Schedule acceptable to the District.
- F. Concurrent with the District's acceptance of Contractor's submitted Detailed Project Schedule, shall be Contractor's signature of acceptance.

1.5 PREPARATION GUIDELINES

- A. Work of this Contract shall be scheduled and progress monitored using a bar chart, although any of the CPM network type scheduling systems, including precedence diagramming or arrow are acceptable. Scheduling system shall show the sequence and interdependence of all activities required for complete performance of all items of work under this contract, including all approvals, shop drawings and other submittals and approvals, and fabrication and delivery activities. Scheduling system shall indicate all inter-relationships between trades and suppliers.
- B. Level of detail indicated in schedule shall be equal to or greater than that provided by Table of Contents of Contract Technical Specifications, including any addenda. Duration and events indicated on schedule shall conform to phasing set forth in the Contract and shall show any area or building within a particular phase. Schedule shall indicate any and all Contract "milestone events" and other milestones agreed to by the District, but no other manually-imposed dates will be accepted unless approved.
- C. Detailed Project Schedule shall represent a practical plan to complete work within time requirements of the Contract.
 - 1. The Contractor may submit a Detailed Project Schedule depicting completion of the Work in a duration shorter than the Contract Time; provided that such Detailed Project Schedule shall not be a basis for adjustment to the Contract Price in the event that completion of the Work shall occur after the time depicted therein, nor shall such Detailed Project Schedule be the basis for any extension of the Contract Time.
 - 2. A schedule found unacceptable by the District shall be revised by Contractor and resubmitted.
- D. Detailed Project schedule shall clearly indicate sequence of construction activities, grouped by applicable phase and sorted by areas, buildings, or facilities within phase, and shall specifically indicate:
 - 1. Start and completion of all items of work, their major components, and interim milestone completion dates, as determined by Contractor and the District.
 - 2. Activities for procurement, delivery, installation of equipment, materials, and other supplies, including:
 - a. Time for submittals, re-submittals, and reviews. Include decision dates for selection of finishes, if applicable.
 - b. Time for fabrication, and delivery of, manufactured products for work.
 - c. Interdependence of procurement and construction activities.
 - d. As applicable, dates for testing, balancing equipment, and final inspection.
- E. Schedule shall be in sufficient detail to assure adequate planning and execution of work.
 - 1. Each activity shall range in duration no longer than two (2) weeks and shall be total of actual days required for completion, and shall include consideration of normal weather impact on completion of that activity.

2. The activities are to be described so that the work is readily identifiable and the progress of each activity can be readily measured. For each activity, Contractor shall identify the trade or subcontractor performing the work, the duration of the activity in work days, the manpower involved by trade, the equipment involved, the location of the work, and a dollar value of the activity. The dollar value assigned to each activity is to be reasonable and based on the amount of labor, materials, and equipment involved. When added together, the dollar value of all activities are to equal the contract price.
3. Schedule shall be suitable, in judgement of the Architect, to allow monitoring and evaluation of progress in performance of work; it shall be calendar time-scaled and, at a minimum, in a Bar Chart format.
4. Activities shall include:
 - a. Description; what is to be accomplished and where.
 - b. Workday duration.
 - c. Scheduled activities shall indicate continuous flow, from left to right.
5. Identify days per week and shifts per day worked; also, non-work days and holidays.
6. For all schedules submitted, Contractor shall provide the following:
 - a. Computerized sorts by:
 - (1) Total Float
 - (2) Early Start
 - (3) Area Sort
 - (4) Trade responsibility
 - b. 60-day look ahead bar charts by early start.
 - c. A narrative explaining progress to date on the project, work required in the succeeding update period, a description of the critical path, and comments concerning potential problem areas.
 - d. Contractor will submit four copies of each of the above.
- F. Failure to include any element of work required for performance of this Contract shall not excuse Contractor from completing work required to comply with the Contract Documents, notwithstanding acceptance of Construction Schedule.
- G. Submittal of Construction Schedule shall be understood to be Contractor's confirmation that the schedule meets requirements of the Contract Documents, and that work will be executed in sequence indicated in schedule.

1.6 REVIEWS, UPDATES, AND REVISIONS

- A. The District will review and return Contractor's Detailed Project Schedule, with summary comments, within Seventeen (17) calendar days. If revisions are required, Contractor shall resubmit Schedule within fourteen (14) calendar days following receipt of the District's comments.
- B. After Contractor and the District agree to a final schedule, it will become the Project Construction Schedule and considered part of the Contract Documents. No changes to Schedule will be allowed unless mutually agreed upon with the District.

- C. Contractor shall analyze and update the Detailed Project Schedule:
1. As part of monthly payment application, Contractor shall submit to and participate with the District in a schedule review to include:
 - a. Actual completion dates for work items completed during report period.
 - b. Actual start dates for work items started during report period.
 - c. Estimated remaining duration for work items in progress, which will not exceed original duration for activity.
 - d. Estimated start dates for work items scheduled to start during month following report period, if applicable.
 - e. Changes in duration of work items.
 - f. A summary bar chart schedule, organized first by work segment plan, and then by area (building number or other appropriate sub-division) shall show construction progress in each area. The previous schedule shall be included in this report to compute the current performance with the original planned sequence of work.
 2. In case of a change to Contractor's planned sequence of work, Contractor shall include a narrative report with updated progress schedule which shall include, but not be limited to, a description of problem areas, current and anticipated delaying factors, and any proposed revisions for a recover plan.
 3. All change orders affecting this schedule shall be clearly identified as a separate and new activity.
 4. Review of Detailed Project Schedule will not relieve Contractor of responsibility for accomplishing all work in accordance with the Contract Documents.
- D. Updates: The Contractor shall submit to the District, with each payment application, an up-to-date Detailed Project Schedule to include following:
1. Work Item Report: Detailing work items and dependencies as indicated on Bar Chart.
 2. Separate listing of activities completed during reporting period.
 3. Separate listing of activities which are currently in progress, indicating their remaining duration and percentages completed.
 4. Separate listing of activities which are causing delay in work progress.
 5. Narrative report to define problem areas, anticipated delays, and impact on Detailed Project Schedule. Report corrective action taken, or proposed, and its effect, including effect of changes on schedules of separate contractors.
 6. Resolution of conflict between actual work progress and schedule logic: when out-of-sequence activities develop in the Schedule because of actual construction progress, Contractor shall submit a revised schedule to conform to current job sequence and direction.

- E. If, according to current updated Detailed Project Schedule, the District determines Contractor is behind the Contract completion date or any interim milestone completion dates, considering all time extensions to which Contractor is entitled, Contractor shall submit a revised schedule, showing a workable plan and a narrative description to complete project on time in accordance with Article 1.06, Paragraph C-2.
 - 1. The District shall withhold progress payments until a revised schedule, acceptable to the District, is submitted by Contractor.
- F. Scheduling of change or extra work orders is responsibility of Contractor.
 - 1. Contractor shall revise Detailed Project Schedule to incorporate all activities involved in completing change orders or extra work orders and submit it to the District for review.
- G. If the District finds Contractor is entitled to extension of any completion date, under provisions of the Contract, the District's determination of total number of days extension will be based upon current analysis of Construction Schedule, and upon data relevant to extension.
- H. Contractor acknowledges and agrees that delays to non-critical activities will not be considered a basis for a time extension unless activities become critical. Non-critical activities are those activities which, when delayed, do not affect an interim or final Contract completion date.
- I. Any claim for extension of time shall be made in writing to the Architect not more than seven (7) days after commencement of delay, otherwise, it shall be deemed finally waived for all purposes. Contractor shall provide an estimate of probable effect of such delay on progress of work as part of claim.

1.7 CONTRACTOR'S RESPONSIBILITY

- A. Nothing in these requirements shall be deemed to be an assumption of Contractor's authority and responsibility to plan and schedule work as Contractor sees fit, subject to all other requirements of Contract Documents.
- B. Contractor shall provide at all times sufficient competent labor, materials, and equipment to properly carry on work and to insure completion of each part in accordance with Construction Schedule and within time agreed.
- C. Contractor shall be responsible for ensuring that all submittals to the District are accurate and consistent. Damages, including extra time and cost, caused by inaccuracies from Contractor will be compensated by Contractor.

1.8 SUSPENSION OF PAYMENTS

- A. Initial Submittal: The District has the right to withhold progress payments until Detailed Project Schedule is accepted by the District.
- B. Update Submittals: The District has the right to withhold progress payments if Contractor fails to update and submit Detailed Project Schedule and reports as required by the District.

1.9 RECORD COPY

- A. At completion of work items, submit Detailed Project Schedule reflecting "as-built" sequence.

1.10 FORM OF SUBMITTAL

- A. All Detailed Project Schedule submittals shall be transmitted with a Letter of Transmittal and shall include three (3) hard copies and one (1) electronic copy.

PART 2 – PRODUCTS
NOT USED

PART 3 – EXECUTION
NOT USED

END OF SECTION

**SECTION 01 33 00
SUBMITTAL PROCEDURES**

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Sections:
 - 1. Division 1 Section "Operation and Maintenance Manuals" for submitting operation and maintenance manuals.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action.
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.3 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or modifications to submittals noted by the Architect and additional time for handling and reviewing submittals required by those corrections.

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. All submittals to be provided by Contractor within 15 days of award of bid.
- B. Architect's Digital Data Files: Electronic copies of CAD Drawings of the Contract Drawings will **not** be provided by Architect for Contractor's use in preparing submittals.
- C. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that requires sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

- D. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 18 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
 4. DSA Deferred Approval: In addition to the review periods indicated above allow 90 days for DSA review and approval.
- E. Identification and Information: Place a permanent label or title block on each paper copy submittal item for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
 3. Include the following information for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Name of subcontractor.
 - g. Name of supplier.
 - h. Name of manufacturer.
 - i. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06 10 00.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06 10 00.01.A).
 - j. Number and title of appropriate Specification Section.
 - k. Drawing number and detail references, as appropriate Location(s) where product is to be installed, as appropriate.
 - l. Other necessary identification.
- F. Identification and Information: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file with links enabling navigation to each item.
 2. Name file with submittal number or other unique identifier, including revision identifier.
 - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-06 10 00.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-06 10 00.01.A).
 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
 4. Include the following information on an inserted cover sheet:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Name of firm or entity that prepared submittal.
 - g. Name of subcontractor.
 - h. Name of supplier.
 - i. Name of manufacturer.
 - j. Number and title of appropriate Specification Section.
 - k. Drawing number and detail references, as appropriate.
 - l. Location(s) where product is to be installed, as appropriate.
 - m. Related physical samples submitted directly.
 - n. Other necessary identification.
- G. Options: Identify options requiring selection by the Architect.
- H. Deviations: Identify deviations from the Contract Documents on submittals.
- I. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
- J. Transmittal: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.

1. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- K. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- L. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, and authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- M. Use for Construction: Use only final submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements:
1. Action Submittals: Submit six paper copies of each submittal, unless otherwise indicated. Architect through owner's project manager will return at least two copies.
 2. Informational Submittals: Submit four paper copies of each submittal, unless otherwise indicated. Architect and owner's project manager will not return copies.
 3. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 1 Section "Closeout Procedures."
 4. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
 - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
 5. Test and Inspection Reports Submittals: Comply with requirements specified in Division 1 Section "Quality Requirements."
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 5. Submit Product Data before or concurrent with Samples.
 6. Submit Product Data in the following format:
 - a. Six paper copies of Product Data, unless otherwise indicated. Architect, through owner's project manager, will return two copies.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.

- f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 - 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 42 inches (750 by 1067 mm)].
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
- 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 - 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 - 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 - 4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit four full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect, through Owner's Project Manager, will return one submittal with options selected.
 - 5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit four sets of Samples. Architect and Owner will retain two Sample sets; remainder will be returned.

- 1) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- E. Contractor's Construction Schedule: Comply with requirements specified in Division 1 Section "Project Record Documents."
- F. Application for Payment: Comply with requirements specified in Division 1 Section "Payment Procedures."
- G. Schedule of Values: Comply with requirements specified in Division 1 Section "Payment Procedures."
- H. Coordination Drawings: Comply with requirements specified in Division 1 Section "Project Management and Coordination."
- I. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- J. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on American Welding Society (AWS) forms. Include names of firms and personnel certified.
- K. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- L. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- M. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- N. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- O. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- P. Product Test Reports: Submit written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- Q. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- R. Schedule of Tests and Inspections: Comply with requirements specified in Division 1 Section "Quality Controls."
- S. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

- T. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- U. Field Test Reports: Submit reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- V. Maintenance Data: Comply with requirements specified in Division 1 Section "Operation and Maintenance Manuals."
- W. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES

- 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 Architect.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally-signed PDF electronic file and three paper copies of certificate, 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.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Division 1 Section "Project Closeout."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

- B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- D. Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION

SECTION 01 42 00 REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

AA	Aluminum Association, Inc. (The)
AAADM	American Association of Automatic Door Manufacturers
AABC	Associated Air Balance Council
AAMA	American Architectural Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists
ABAA	Air Barrier Association of America
ABMA	American Bearing Manufacturers Association
ACI	American Concrete Institute
ACPA	American Concrete Pipe Association
AEIC	Association of Edison Illuminating Companies, Inc. (The)
AF&PA	American Forest & Paper Association
AGA	American Gas Association
AGC	Associated General Contractors of America (The)
AHA	American Hardboard Association (Now part of CPA)
AHAM	Association of Home Appliance Manufacturers
AI	Asphalt Institute
AIA	American Institute of Architects (The)
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ALCA	Associated Landscape Contractors of America (Now PLANET - Professional Landcare Network)
ALSC	American Lumber Standard Committee, Incorporated

AMCA	Air Movement and Control Association International, Inc.
ANSI	American National Standards Institute
AOSA	Association of Official Seed Analysts, Inc.
APA	Architectural Precast Association
APA	APA - The Engineered Wood Association
APA EWS	APA - The Engineered Wood Association; Engineered Wood Systems (See APA - The Engineered Wood Association)
API	American Petroleum Institute
ARI	Air-Conditioning & Refrigeration Institute
ARMA	Asphalt Roofing Manufacturers Association
ASCE	American Society of Civil Engineers
ASCE/SEI	American Society of Civil Engineers/Structural Engineering Institute (See ASCE)
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	ASME International (American Society of Mechanical Engineers International)
ASSE	American Society of Sanitary Engineering
ASTM	ASTM International (American Society for Testing and Materials International)
AWCI	Association of the Wall and Ceiling Industry
AWCMA	American Window Covering Manufacturers Association (Now WCMA)
AWI	Architectural Woodwork Institute
AWPA	American Wood Protection Association (Formerly: American Wood Preservers' Association)
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Industry Association (The)
BICSI	BICSI, Inc.
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association International)

BISSC	Baking Industry Sanitation Standards Committee
BWF	Badminton World Federation (Formerly: IBF - International Badminton Federation)
CCC	Carpet Cushion Council
CDA	Copper Development Association
CEA	Canadian Electricity Association
CEA	Consumer Electronics Association
CFFA	Chemical Fabrics & Film Association, Inc.
CGA	Compressed Gas Association
CIMA	Cellulose Insulation Manufacturers Association
CISCA	Ceilings & Interior Systems Construction Association
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute
CRRC	Cool Roof Rating Council
CPA	Composite Panel Association
CPPA	Corrugated Polyethylene Pipe Association
CRI	Carpet and Rug Institute (The)
CRSI	Concrete Reinforcing Steel Institute
CSA	Canadian Standards Association
CSA	CSA International (Formerly: IAS - International Approval Services)
CSI	Cast Stone Institute
CSI	Construction Specifications Institute (The)
CSSB	Cedar Shake & Shingle Bureau
CTI	Cooling Technology Institute (Formerly: Cooling Tower Institute)
DHI	Door and Hardware Institute
EIA	Electronic Industries Alliance
EIMA	EIFS Industry Members Association
EJCDC	Engineers Joint Contract Documents Committee

EJMA	Expansion Joint Manufacturers Association, Inc.
ESD	ESD Association (Electrostatic Discharge Association)
ETL SEMCO	Intertek ETL SEMCO (Formerly: ITS - Intertek Testing Service NA)
FIBA	Federation Internationale de Basketball (The International Basketball Federation)
FIVB	Federation Internationale de Volleyball (The International Volleyball Federation)
FM Approvals	FM Approvals LLC
FM Global	FM Global (Formerly: FMG - FM Global)
FMRC	Factory Mutual Research (Now FM Global)
FRSA	Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.
FSA	Fluid Sealing Association
FSC	Forest Stewardship Council
GA	Gypsum Association
GANA	Glass Association of North America
GRI	(Part of GSI)
GS	Green Seal
GSI	Geosynthetic Institute
HI	Hydraulic Institute
HI	Hydronics Institute
HMMA	Hollow Metal Manufacturers Association (Part of NAAMM)
HPVA	Hardwood Plywood & Veneer Association
HPW	H. P. White Laboratory, Inc.
IAS	International Approval Services (Now CSA International)
IBF	International Badminton Federation (Now BWF)
ICEA	Insulated Cable Engineers Association, Inc.

ICRI	International Concrete Repair Institute, Inc.
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The)
IESNA	Illuminating Engineering Society of North America
IEST	Institute of Environmental Sciences and Technology
IGCC	Insulating Glass Certification Council
IGMA	Insulating Glass Manufacturers Alliance
ILI	Indiana Limestone Institute of America, Inc.
ISO	International Organization for Standardization Available from ANSI
ISSFA	International Solid Surface Fabricators Association
ITS	Intertek Testing Service NA (Now ETL SEMCO)
ITU	International Telecommunication Union
KCMA	Kitchen Cabinet Manufacturers Association
LMA	Laminating Materials Association (Now part of CPA)
LPI	Lightning Protection Institute
MBMA	Metal Building Manufacturers Association
MFMA	Maple Flooring Manufacturers Association, Inc.
MFMA	Metal Framing Manufacturers Association, Inc.
MH	Material Handling (Now MHIA)
MHIA	Material Handling Industry of America
MIA	Marble Institute of America
MPI	Master Painters Institute
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc.
NAAMM	National Association of Architectural Metal Manufacturers
NACE	NACE International (National Association of Corrosion Engineers International)
NADCA	National Air Duct Cleaners Association

NAGWS	National Association for Girls and Women in Sport
NAIMA	North American Insulation Manufacturers Association
NBGQA	National Building Granite Quarries Association, Inc.
NCAA	National Collegiate Athletic Association (The)
NCMA	National Concrete Masonry Association
NCPI	National Clay Pipe Institute
NCTA	National Cable & Telecommunications Association
NEBB	National Environmental Balancing Bureau
NECA	National Electrical Contractors Association
NeLMA	Northeastern Lumber Manufacturers' Association
NEMA	National Electrical Manufacturers Association
NETA	InterNational Electrical Testing Association
NFHS	National Federation of State High School Associations
NFPA	NFPA (National Fire Protection Association)
NFRC	National Fenestration Rating Council
NGA	National Glass Association
NHLA	National Hardwood Lumber Association
NLGA	National Lumber Grades Authority
NOFMA	NOFMA: The Wood Flooring Manufacturers Association (Formerly: National Oak Flooring Manufacturers Association)
NOMMA	National Ornamental & Miscellaneous Metals Association
NRCA	National Roofing Contractors Association
NRMCA	National Ready Mixed Concrete Association
NSF	NSF International (National Sanitation Foundation International)
NSSGA	National Stone, Sand & Gravel Association
NTMA	National Terrazzo & Mosaic Association, Inc. (The)
NTRMA	National Tile Roofing Manufacturers Association (Now TRI)

NWWDA	National Wood Window and Door Association (Now WDMA)
OPL	Omega Point Laboratories, Inc. (Now ITS)
PCI	Precast/Prestressed Concrete Institute
PDCA	Painting & Decorating Contractors of America
PDI	Plumbing & Drainage Institute
PGI	PVC Geomembrane Institute
PLANET	Professional Landcare Network (Formerly: ACLA - Associated Landscape Contractors of America)
PTI	Post-Tensioning Institute
RCSC	Research Council on Structural Connections
RFCI	Resilient Floor Covering Institute
RIS	Redwood Inspection Service
SAE	SAE International
SDI	Steel Deck Institute
SDI	Steel Door Institute
SEFA	Scientific Equipment and Furniture Association
SEI/ASCE	Structural Engineering Institute/American Society of Civil Engineers (See ASCE)
SGCC	Safety Glazing Certification Council
SIA	Security Industry Association
SIGMA	Sealed Insulating Glass Manufacturers Association (Now IGMA)
SJI	Steel Joist Institute
SMA	Screen Manufacturers Association
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SMPTE	Society of Motion Picture and Television Engineers
SPFA	Spray Polyurethane Foam Alliance (Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray Polyurethane Foam Division)
SPIB	Southern Pine Inspection Bureau (The)

SPRI	Single Ply Roofing Industry
SSINA	Specialty Steel Industry of North America
SSPC	SSPC: The Society for Protective Coatings
STI	Steel Tank Institute
SWI	Steel Window Institute
SWRI	Sealant, Waterproofing, & Restoration Institute
TCA	Tile Council of America, Inc. (Now TCNA)
TCNA	Tile Council of North America, Inc.
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance
TMS	The Masonry Society
TPI	Truss Plate Institute, Inc.
TPI	Turfgrass Producers International
TRI	Tile Roofing Institute
UL	Underwriters Laboratories Inc.
UNI	Uni-Bell PVC Pipe Association
USAV	USA Volleyball
USGBC	U.S. Green Building Council
USITT	United States Institute for Theatre Technology, Inc.
WASTEC	Waste Equipment Technology Association
WCLIB	West Coast Lumber Inspection Bureau
WCMA	Window Covering Manufacturers Association
WCSC	Window Covering Safety Council (Formerly: WCMA - Window Covering Manufacturers Association)
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association)
WI	Woodwork Institute (Formerly: WIC - Woodwork Institute of California)
WIC	Woodwork Institute of California (Now WI)
WMMPA	Wood Moulding & Millwork Producers Association

WSRCA Western States Roofing Contractors Association

WWPA Western Wood Products Association

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

IAPMO International Association of Plumbing and Mechanical Officials

ICC International Code Council

ICC-ES ICC Evaluation Service, Inc.

UBC Uniform Building Code
(See ICC)

D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CE Army Corps of Engineers

CPSC Consumer Product Safety Commission

DOC Department of Commerce

DOD Department of Defense

DOE Department of Energy

EPA Environmental Protection Agency

FAA Federal Aviation Administration

FCC Federal Communications Commission

FDA Food and Drug Administration

GSA General Services Administration

HUD Department of Housing and Urban Development

LBL Lawrence Berkeley National Laboratory

NCHRP National Cooperative Highway Research Program
(See TRB)

NIST National Institute of Standards and Technology

OSHA Occupational Safety & Health Administration

PBS Public Buildings Service
(See GSA)

PHS Office of Public Health and Science

RUS	Rural Utilities Service (See USDA)
SD	State Department
TRB	Transportation Research Board
USDA	Department of Agriculture
USPS	Postal Service

- E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ADAAG	Americans with Disabilities Act (ADA) Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities Available from U.S. Access Board
CFR	Code of Federal Regulations Available from Government Printing Office
DOD	Department of Defense Military Specifications and Standards Available from Department of Defense Single Stock Point
DSCC	Defense Supply Center Columbus (See FS)
FED-STD	Federal Standard (See FS)
FS	Federal Specification Available from Department of Defense Single Stock Point Available from Defense Standardization Program Available from General Services Administration Available from National Institute of Building Sciences
FTMS	Federal Test Method Standard (See FS)
MIL	(See MILSPEC)
MIL-STD	(See MILSPEC)
MILSPEC	Military Specification and Standards Available from Department of Defense Single Stock Point
UFAS	Uniform Federal Accessibility Standards Available from Access Board

- F. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CBHF State of California, Department of Consumer Affairs Bureau of Home Furnishings and Thermal Insulation

CCR California Code of Regulations

CPUC California Public Utilities Commission

TFS Texas Forest Service
Forest Resource Development

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

**SECTION 01 43 00
QUALITY CONTROL**

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. 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. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 2. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Sections:
 - 1. 01 45 29 Testing and Inspection

1.2 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.
- C. Mockups: Full size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
- D. Preconstruction Testing: Tests and inspections performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
- E. Product Testing: Tests and inspections that are performed by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.

- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade or trades.
- J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.3 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.4 INFORMATIONAL SUBMITTALS

- A. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems.
 - 1. Seismic-force resisting system, designated seismic system, or component listed in the designated seismic system quality assurance plan prepared by the Architect.
 - 2. Main wind-force resisting system or a wind-resisting component listed in the wind-force-resisting system quality assurance plan prepared by the Architect.
- B. Testing Agency Qualifications: 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.

1.5 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. 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. Record of temperature and weather 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.
- B. Manufacturer's Field Reports: Prepare written information documenting tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 5. Other required items indicated in individual Specification Sections.
- C. 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. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. 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, as well as sufficient production capacity to produce required units.

- C. 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.
- D. 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.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or products that are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain Specification Sections 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. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
- H. Manufacturer's Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
 - 1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. When testing is complete, remove test specimens, assemblies, mockups; do not reuse products on Project.
 - 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, 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.
- J. 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 Architect.

2. Notify Architect 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 Architect's approval of mockups before starting work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
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 types of testing and inspecting they are engaged to perform.
 2. 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, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
 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 same entity engaged by Owner, unless agreed to in writing by Owner.
 2. Notify testing agencies at least 48 hours in advance of time when Work that requires testing or inspecting will 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. Manufacturer's Field Services: Where indicated, engage a manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports.

- D. 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 replaced Work that failed to comply with the Contract Documents.
- E. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - 1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 - 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 - 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 - 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 - 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 - 6. Do not perform any duties of Contractor.
- F. 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.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -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.

1.8 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner will engage a qualified testing agency and/or special inspector to conduct special tests and inspections required by authorities having jurisdiction as

the responsibility of Owner, as indicated in Statement of Special Inspections attached to this Section, and as follows:

- B. Special Tests and Inspections: Conducted by a qualified testing agency or special inspector as required by authorities having jurisdiction, as indicated in individual Specification Sections, and as follows:
 - 1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
 - 2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 - 3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
 - 4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 - 5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 - 6. Retesting and re-inspecting corrected work.

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 Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 1.
- 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 45 29
TESTING AND INSPECTION

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes: Cooperate with the Owner's selected testing agency, the Project Inspector, and others responsible for testing and inspecting the Work, and assist the Owner by coordinating such testing and inspecting services as specified in this Section and/or elsewhere in the Contract Documents including the attached Division of State Architect Structural Tests and Inspections sheet (enclosed).
- B. Related Work Specified Elsewhere:
 - 1. Requirements for testing may be required in other Sections of these Specifications.
 - 2. Where no testing requirements are specified or required by reference standards or authorities having jurisdiction, the Owner may require such testing to be performed under current pertinent standards for testing. Payment for such testing will be made as described herein.
- C. Work Not Included:
 - 1. The Owner will select a pre-qualified independent testing laboratory and Inspector as approved by the Division of the State Architect, Office of Regulation Services.
 - 2. The Owner will pay for initial services of the testing laboratory as further described hereinafter.

1.2 QUALITY ASSURANCE

- A. The Owner will select an independent testing laboratory to conduct the tests. Selection of the material required to be tested shall be by the laboratory or the Owner's representative and not by the Contractor.
- B. Qualifications of Testing Laboratory: The testing laboratory shall be qualified to the Owner's acceptance in accordance with ASTM E 329. The testing laboratory shall be qualified by the Division of State Architect in accordance with Interpretation of Regulation No. 1R1-1.
- C. Codes and Standards: Testing, when required, will be in accordance with pertinent codes and regulations and with selected standards of the American Society for Testing and Materials and other organizations or agencies which publish recognized codes, standards, or tests. Refer to Article 3.04 – Required Testing of this Section.
- D. The project specifications shall be in accordance with the provisions of the Standard Specifications for Public Works Construction (SSPWC) 2012 Edition.

1.3 TEST REPORT DISTRIBUTION

- A. Promptly process and distribute required copies of test reports and related instructions to ensure necessary retesting and/or replacement of materials with the least possible delay in progress of the Work.

- B. One copy of test reports shall be forwarded to the Division of the State Architect by the testing agency. Such reports shall include tests made, regardless of whether such tests indicate that the material is satisfactory or unsatisfactory. Samples taken but not tested shall also be reported. Records of special sampling operations as required shall also be reported. The reports shall show that the material or materials were sampled and tested in accordance with the requirements of Title 24 and with the approved specifications. Test reports shall show the specified design strength. They shall also state definitely whether or not the material or materials tested comply with requirements.
- C. Each testing agency shall submit to the Division of the State Architect a verified report in duplicate covering tests which are required to be made by that agency during the progress of the project. Such report shall be furnished each time that work on the project is suspended, including tests up to that time, and at the completion of the project.

1.4 PAYMENT FOR TESTING SERVICES

- A. Initial Services: The Owner will pay for initial testing and inspection except as specifically modified herein-after or as specified otherwise in technical sections. Provided the results of inspection indicating compliance with the Contract Documents.
- B. Retesting: When initial tests or inspection indicate noncompliance with the Contract Documents, subsequent retesting or re-inspection occasioned by the noncompliance shall be performed by the same testing laboratory or Inspector and the costs thereof will be deducted by the Owner from the Contract Sum. Retesting and re-inspection will continue until test or inspection results indicate compliance.
- C. Code Compliance Testing: Inspections and tests required by codes or ordinances, or by authorities having jurisdiction and made by a legally constituted authority, shall be the responsibility of and shall be paid for by the Owner, but back charged to the Contractor in case of retesting due to noncompliance.
- D. Specified Inspections and Tests: Tests and inspections specified in the Specifications, directly or by reference, shall be coordinated by the Contractor at his expense and paid for by the Owner. Corrections of noncompliance and test failures shall be paid for by the Owner, but shall be back charged to the Contractor. Re-inspection and retesting shall be in accordance with paragraph 1.04-B.
- E. Contractor's Convenience Testing: Inspecting or testing performed exclusively for the Contractor's convenience shall be the sole responsibility of and at the expense of the Contractor.

1.5 INSPECTION BY THE OWNER

- A. The Owner and his representatives will have access, for the purpose of inspection, to parts of the work and to the shops wherein the work is in preparation, and the Contractor shall maintain proper facilities and provide safe access for such inspection.
- B. The Owner shall have the right to reject materials and workmanship which are defective, and to require their correction. Rejected workmanship shall be satisfactorily corrected and rejected materials shall be removed from the premises without charge to the Owner. If the Contractor does not correct such rejected within a reasonable time, fixed by written notice, the Owner may correct rejected work and charge the expense to the Contractor.
- C. Should it be considered necessary or advisable by the Owner at any time before final acceptance of the entire work to make an examination of work already completed by removing or tearing out the same, the Contractor shall on request promptly furnish necessary facilities, labor and materials. If such work is found to be defective in respect due to fault of the Contractor or his subcontractor, he shall defray expenses of such

examinations and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the contract, the additional cost of labor and material necessarily involved in the examination and replacement will be allowed the Contractor.

1.6 PROJECT INSPECTOR

- A. An Inspector employed by the Owner in accordance with the requirements of State of California Building Code, Title 24, Part 1, and qualified in accordance with Division of State Architect will be assigned to the work. His duties are specifically defined in Title 24, Part 1, Section 4-342, reprinted herein:

1. Duties of the Project Inspector.

- (A) General: The Project Inspector shall act under the direction of the A/E/Engineer.
- (B) Duties: The general duties of the Project Inspector in fulfilling his or her responsibilities are as follows:
 - (1) Inspection: He or she must have actual personal knowledge, obtained by his personal inspection of the work of construction in stages of its progress, that the requirements of the approved plans and specifications are being completely executed. Inspection means complete inspection of every part of the work. Work, such as concrete work or brick work which can be inspected only as it is placed, shall require the constant presence of the Project Inspector. Other types of work which can be completely inspected after the work is installed may be carried on while the Inspector is not present. In any case, the Project Inspector must personally inspect every part of the work. In no case shall the Project Inspector have or assume duties which will prevent him or her from providing inspection.

The Project Inspector may obtain personal knowledge of the work of construction, either on-site or off-site, performed under the inspection of a Special Inspector or Assistant Inspector from the reporting of others on testing or inspection of materials and workmanship for compliance with the plans, specifications and applicable standards. The exercise of reasonable diligence to obtain the facts shall be required.
 - (2) Relations with A/E/Engineer: The Project Inspector shall work under the general direction of the A/E/Engineer. Inconsistencies or seeming errors in the A/E/Engineer for his interpretation and instructions. In no case, however, shall the instruction of the A/E/Engineer be construed to cause work to be done which is not in conformity with the approved plans, specifications, and change orders.
 - (3) Job File: The Project Inspector shall keep a file of approved plans and specifications (including approved addenda or change orders) on the job, and shall immediately return unapproved documents to the A/E for proper action. The Project Inspector, as a condition of his employment, shall have and maintain on the job, codes and documents referred to in the plans and specifications.

- (4) Project Inspector's Semi-Monthly Reports: The Project Inspector shall keep the A/E/Engineer thoroughly informed as to the progress of the work by making semi-monthly reports in writing as required in Section 37.
- (5) Not Used.
- (6) Construction Procedure Records: The Project Inspector shall keep a record of certain phases of construction procedure. All such records of construction procedure shall be kept on the job until the completion of the work. These records shall be made a part of the permanent school records.
- (7) Deviations: The Project Inspector shall notify the Contractor, in writing, of deviations from the approved plans and specifications which are not immediately corrected by the Contractor when brought to his or her attention. Copies of such notice shall be forwarded immediately to the A/E/Engineer. Failure on the part of the Project Inspector to notify the Contractor of deviations from the approved plans and specifications shall in no way relieve the Contractor of responsibility to complete the work covered by his or her contract in accordance with the approved plans and specifications and laws and regulations.
- (8) Verified Reports: The Project and Special Inspectors shall each make and submit to the Division of the State Architect verified reports. The Project Inspector shall prepare and deliver to the Division of the State Architect detailed statements of fact regarding materials, operations, etc., when requested. Violations: Failure, refusal, or neglect on the part of the Inspector to notify the Contractor of work which does not comply with the requirements of the approved plans and specifications, or failure, refusal, or neglect to report immediately, in writing, such violation to the A/E/Engineer, to the School Board, and to the Division of the State Architect shall constitute a violation of the act and shall be cause for the Division of the State Architect to take action.

Note: Authority cited: Section 39152 and 81142, Education Code. Reference: Sections 39151, 39153, 81141 and 81143, Education Code."

- B. The work of construction in stages of progress shall be subject to the personal continuous observation of the Project Inspector as continuous observation is defined by Title 24. He shall have free access to all parts of the work at any time. The Contractor shall furnish the Project Inspector reasonable facilities for obtaining such information as may be necessary to keep him fully informed respecting the progress and manner of the work and the character of the materials. Inspection of the work shall not relieve the Contractor from obligation to fulfill this Contract.

1.7 OWNER'S OTHER PERSONNEL

- A. From time to time, other personnel in the employ of the Owner may inspect the Work when the Work is in progress but shall have no authority to direct the Contractor or request changes in the Work except as may be provided elsewhere in the Contract Documents.

1.8 REPRESENTATIVE OF THE DIVISION OF THE STATE ARCHITECT

- A. Architect shall have access to the site in accordance with Title 24, Part 1, 4-333.
- B. Field Engineers and Inspectors from D.S.A. Structural Safety Section, Fire & Life Safety Review and Access Compliance shall have access to the site in accordance with Title 24, Part 1, 4-334.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

3.1 COOPERATION WITH TESTING LABORATORY AND INSPECTORS

- A. Inspectors and representatives of the testing laboratory shall have access to the work. Provide facilities for such access in order that the testing, inspection, and the obtaining of samples may be done properly.
- B. Contractor shall deliver material specimens to the Owner's testing lab, which must by terms of the Contract be tested prior to inclusion in the Project, at least 45 days prior to scheduled delivery to the job site.
- C. Material shipped by the Contractor from the source of supply prior to having satisfactorily passed such testing and inspection or prior to the receipt of notice from said representative that such testing and inspection will not be required shall not be incorporated in the job.

3.2 TAKING SPECIMENS

- A. Field specimens and samples for testing, unless otherwise provided in these Contract Documents, shall be selected and taken by the Testing Laboratory or Project Inspector and not the Contractor. Sampling equipment and personnel will be provided by the testing laboratory. Deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory. Soil samples for approval of import fill shall be picked-up by the Testing Laboratory.

3.3 SCHEDULES FOR TESTING

- A. Establishing Schedule:
 - 1. By advance discussion with the testing laboratory selected by the Owner, determine the time required for the laboratory to perform its tests and to issue each of its findings.
 - 2. Provide required time within the construction schedule.
- B. Revising Schedule: When changes of construction schedule are necessary during construction, coordinate such changes of schedule with the testing laboratory as required.
- C. Adherence to Schedule: When the testing laboratory is ready to test according to the determined schedules, but is prevented from testing or taking specimens due to incompleteness of the work, extra charges for testing attributable to the delay may be back-charged to the Contractor and will be deducted by the Owner from the Contract Sum.

3.4 REQUIRED TESTING

Conform to and comply with Tests and Inspections, as indicated on the State of California, Division of the State Architect, Structural Tests and Inspections, "Form DSA 103".

END OF SECTION

**SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS**

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Section:
 - 1. Division 1 Section "Summary" for limitations on work restrictions and utility interruptions.

1.2 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.
- B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.3 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

1.4 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.5 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top rails.
- B. Portable Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide galvanized steel bases for supporting posts.

2.2 TEMPORARY FACILITIES

- A. Field Offices, General: Required.
- B. Common-Use Field Office: Required.
- C. Inspector Office: Contractor to provide 20'-0" X 8'-0" prefabricated or mobile unit with serviceable finishes, temperature controls, power, data, phone service and foundations adequate for normal loading. Office to be used exclusively by Inspector of Record during construction. Access to trailer shall be through gate in temporary fencing.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
 - 1. Locate facilities to limit site disturbance as specified in Division 1 Section "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- C. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities. Contractor not to use adjacent school toilet facilities.
- E. Heating and/or Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- F. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- G. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
- H. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
 1. Install electric power service overhead or underground, unless otherwise indicated.
 2. Connect temporary service to Owner's existing power source, as directed by Owner.
- I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
- J. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one telephone line(s) for each field office.
 1. Provide additional telephone lines for the following:
 - a. Provide a dedicated telephone line for each facsimile machine in each field office.
 2. At each telephone, post a list of important telephone numbers.
 - a. Police and fire departments.
 - b. Ambulance service.
 - c. Contractor's home office.

- d. Architect's office.
 - e. Engineers' offices.
 - f. Owner's office.
 - g. Principal subcontractors' field and home offices.
3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet (9 m) of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Temporary Use of Permanent Roads and Paved Areas: Locate temporary roads and paved areas in same location as permanent roads and paved areas. Construct and maintain temporary roads and paved areas adequate for construction operations. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.

1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
2. Prepare subgrade and install subbase and base for temporary roads and paved areas according to Division 2 Section "Earthwork."
3. Recondition base after temporary use, including removing contaminated material, regrading, proof rolling, compacting, and testing.
4. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course according to Division 2 Section "Asphalt Paving."

C. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

D. Parking: Street parking is available as posted.

E. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.
 2. Remove snow and ice as required to minimize accumulations.
- F. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
1. Identification Signs: Provide Project identification signs as indicated on Drawings.
 2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
 - a. Provide temporary, directional signs for construction personnel and visitors.
 3. Maintain and touchup signs so they are legible at all times.
- G. Waste Disposal Facilities: Comply with requirements specified in Division 1 Section "Construction Waste Management."
- H. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with Division 1 Section "Execution Requirements" for progress cleaning requirements.
- I. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- J. Temporary Elevator Use: Use of elevators is not permitted.
- K. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.
- L. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.
- M. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- B. Temporary Erosion and Sedimentation Control: Comply with requirements of the latest SWRCB Construction General Permit or authorities having jurisdiction, whichever is more stringent and requirements specified in Division 2 Section "Site Clearing."
- C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent

properties and walkways, according to requirements of the latest SWRCB Construction General Permit or authorities having jurisdiction, whichever is more stringent.

- D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- E. Tree and Plant Protection: Comply with requirements specified in Division 2 Section "Tree Protection and Trimming."
- F. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- G. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Obtain extended warranty for Owner. Perform control operations lawfully, using environmentally safe materials.
- H. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
 - 1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
 - 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel.
- I. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.
- J. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- K. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- L. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weather tight enclosure for building exterior.
 - 1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.
- M. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
 - 1. Prohibit smoking in construction areas.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.

3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.5 MOISTURE AND MOLD CONTROL

- A. Contractor's Moisture Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect materials from water damage and keep porous and organic materials from coming into prolonged contact with concrete.
- C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
 1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 2. Keep interior spaces reasonably clean and protected from water damage.
 3. Discard or replace water-damaged and wet material.
 4. Discard, replace or clean stored or installed material that begins to grow mold.
 5. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.
- D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
 1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
 2. Remove materials that can not be completely restored to their manufactured moisture level within **48** hours.

3.6 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 1 Section "Closeout Procedures."

END OF SECTION

**SECTION 01 60 20
STORAGE AND PROTECTION**

PART 1 – GENERAL

1.1 SUMMARY

- A. Protect products scheduled for use in the Work by means including, but not necessarily limited to, those described in this Section.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to the General Conditions and Supplementary Conditions.
 - 2. Additional procedures also may be prescribed in other Sections of these Specifications.

1.2 QUALITY ASSURANCE

- A. Include within the Contractor's quality assurance program such procedures as are required to assure full protection of work and materials.

1.3 MANUFACTURERS' RECOMMENDATIONS

- A. Except as otherwise approved by the District, determine and comply with manufacturers' recommendations on product handling, storage, and protection.

1.4 PACKAGING

- A. Deliver products to the job site in their manufacturer's original container, with labels intact and legible.
 - 1. Maintain packaged materials with seals unbroken and labels intact until time of use.
 - 2. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the Owner.
- B. The District may reject as non-complying such material and products that do not bear identification satisfactory to the District as to manufacturer, grade, quality, and other pertinent information.

1.5 PROTECTION

- A. Protect finished surfaces, including jambs and soffits of openings used as passageways, through which equipment and materials are handled.
- B. Provide protection for finished surfaces in traffic areas prior to allowing equipment or materials to be moved over such surfaces.
- C. Maintain finished surfaces clean, unmarred, and suitably protected until accepted by the Owner.

1.6 REPAIRS AND REPLACEMENTS

- A. In event of damage, promptly make replacements and repairs to the approval of the Architect and at no additional cost to the Owner.
- B. Additional time required to secure replacements and to make repairs will not be considered by the District to justify an extension in the Contract Time of Completion.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

**SECTION 01 77 00
CLOSEOUT PROCEDURES**

PART 1 – GENERAL

1.1 SECTION INCLUDES:

- A. Closeout Procedures
- B. Final Cleaning.
- C. Pest Control.
- D. Adjusting.
- E. Demonstration and Instructions.
- F. Project Record Documents.
- G. Operation and Maintenance Data.
- H. Warranties.
- I. Spare Parts and Maintenance Materials.

1.2 CLOSEOUT PROCEDURES

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Architect's review.
- B. Prepare and submit to Architect a list of items to be completed or corrected, the value of the items on the list, and reasons why the Work is not complete.
- C. Submit written request to Architect for review of Work.
- D. Submit warranties, bonds, service agreements, certifications, record documents, maintenance manuals, receipt of spare parts and similar closeout documents.
- E. Make final changeover of permanent locks and deliver keys to Owner.
- F. Terminate and remove temporary facilities from Project site.
- G. Advise Owner of change over in heat and other utilities.
- H. Provide submittals to Architect that are required by governing or other authorities.
- I. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- J. Submit affidavit of payment of debts and claims, AIA Document G706.
- K. Submit affidavit of release of liens, AIA Document G706A.

- L. Submit consent of contractors surety to final payment, AIA Document G707.
- M. Owner will occupy all portions of the building as specified in Section 01110.

1.3 FINAL CLEANING

- A. Execute final cleaning prior to final review by Architect.
- B. Employ experienced professional cleaners for final cleaning.
- C. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces.
- D. Vacuum carpeted and soft surfaces. Shampoo if visible stains exist.
- E. Clean equipment and plumbing fixtures to a sanitary condition.
- F. Clean exposed surfaces of grilles, registers and diffusers.
- G. Replace filters of operating mechanical equipment.
- H. Clean debris from roofs, gutters, downspouts, and drainage systems.
- I. Clean site; sweep paved areas, rake clean landscaped surfaces.
- J. Remove waste and surplus materials, rubbish, and construction facilities from the site.
- K. Clean light fixtures and replace burned out lamps and bulbs.
- L. Relamp all lamps and bulbs in lighting fixtures.
- M. Replace defective and noisy ballasts and starters in fluorescent fixtures.
- N. Leave project clean and ready for occupancy by Owner.

1.4 PEST CONTROL

- A. Engage an experienced, licensed exterminator to make final inspection and rid Project of rodents, insects, and other pests. Submit final report to Architect.

1.5 ADJUSTING

- A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

1.6 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of products, systems, and equipment to Owner's personnel two weeks prior to date of final review.
- B. For each demonstration submit list of participants in attendance.
- C. Provide two copies of video tape of each demonstration and instructions session.

- D. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- E. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- F. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed-upon times, at equipment location.
- G. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

1.7 PROJECT RECORD DOCUMENTS

- A. Maintain on site, one set of the following record documents; record actual revisions to the Work in contrasting color.
 - 1. Contract Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other Modifications to the Contract.
 - 5. Reviewed shop drawings, product data, and samples.
- B. Store Record Documents separate from documents used for construction.
- C. Record information concurrent with construction progress.
- D. Specifications: Legibly mark and record at each Product Section in contrasting color ink, description of actual Products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Supplier and installers name and contact information.
 - 3. Changes made by Addenda and Modifications.
- E. Contract Drawings and Shop Drawings: Legibly mark each item in contrasting color ink to record actual construction including:
 - 1. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 3. Field changes of dimension and detail.
 - 4. Details not on original Contract Drawings.
 - 5. Revisions to electrical circuitry and locations of electrical devices and equipment.

6. Note change orders, alternate numbers, and similar information, where applicable.
 7. Identify each record drawing with the written designation of "RECORD DRAWING" located in prominent location.
- F. Record Digital Data Files: Immediately before inspection for Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
 2. Format: Annotated PDF electronic file with comment function enabled.
 3. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 4. Refer instances of uncertainty to Architect for resolution.
 5. Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.
 - (a) Refer to Section 01 33 00 "Submittal Procedures" for requirements related to use of Architect's digital data files.
 - (b) Architect will provide data file layer information, record markups in separate layers.
- G. Record Construction Schedule: Under the provisions of Section 01 32 16.
- I. Submit documents to Architect at time of Substantial Completion.

1.8 OPERATION AND MAINTENANCE DATA

- A. Summary:
1. Organize operation and maintenance data with directory.
 2. Provide operation and maintenance manuals for products, systems, subsystems, and equipment.
 3. Refer to Divisions 2 thru 16 for specific operation and maintenance manual requirements for the Work in those Divisions.
- B. Submit two sets prior to final review, bound in 8-1/2 inch x 11 inch, three ring D size binders with durable vinyl covers.
- C. Prepare binder covers with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder when multiple binders are required.
- D. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with laminated plastic tabs.
- E. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Engineers, Contractor, subcontractors, and major equipment suppliers and manufacturers.

- F. Part 2: Operation and maintenance instructions, arranged by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
1. Performance and design criteria.
 2. List of equipment.
 3. Parts list for each component.
 4. Start-up procedures.
 5. Shutdown instructions.
 6. Normal operating instructions.
 7. Wiring diagrams.
 8. Control diagrams.
 9. Maintenance instructions for equipment and systems.
 10. Maintenance instructions for finishes, including recommended cleaning methods and materials.
- G. Part 3: Project documents and certificates, including the following:
1. Shop drawings and product data.
 2. Air and water balance reports.
 3. Certificates.
 4. Warranties.

1.9 WARRANTIES

- A. Commencement of warranties shall be date of Substantial Completion.
- B. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.
- C. Provide duplicate notarized copies in operation and maintenance manuals.
- D. Execute and assemble documents from subcontractors, suppliers, and manufacturers.
- E. Provide Table of Contents and assemble in binder with durable plastic cover.
- F. Submit prior to final Application for Payment.
- G. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of warranty on the work that incorporates the products.

- H. Manufacturer's disclaimer and limitations on product warranties do not relieve suppliers, manufacturer's, and subcontractors required to countersign special warranties with Contractor.
- I. When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.
- J. When work covered by warranty has failed and has been corrected, reinstate warranty by written endorsement. Reinstated warranty shall be equal to original warranty with equitable adjustment for depreciation.
- K. Upon determination that Work covered by warranty has failed, replace or repair Work to an acceptable condition complying with requirements of the Contract Documents.

1.10 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification Sections.
- B. Deliver to Project site and place in location as directed.
- C. Obtain signed receipt for delivery of materials and submit prior to request for final review by Architect.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

**SECTION 01 77 01
PROJECT CLOSEOUT**

PART 1 – GENERAL

1.1 REFERENCE

- A. Requirements in Addenda, Alternates, Conditions, and Division 1 collectively apply to this work.

1.2 GENERAL

- A. As a prerequisite for final payment, Contractor to complete the work of this Section.
- B. Comply with requirements stated in "Conditions Of The Contract" and in "Specifications" for administrative procedures in closing out the Work.
- C. Related Work Specified Elsewhere:
 - 1. Guarantee Form: See General Conditions.
 - 2. Close-out Submittals: See Respective Spec. Sections.

1.3 PREFINAL INSPECTION; SUBSTANTIAL COMPLETION

- A. Pre-final Inspection:
 - 1. Upon "substantial completion" of the Work, Contractor shall notify Architect and request a "pre-final inspection" of the Work.
 - 2. If Architect concurs that "substantial completion" has been reached, he will review the Work and list items to be completed or corrected. List will be amended as required to include items subsequently observed.
- B. Substantial Completion Defined: "Substantial Completion" of the Work is the status, as approved by the Architect, when construction is sufficiently complete, in accordance with the Contract Documents, so District can occupy or utilize the Work for the use for which it is intended, without incomplete work scope items either interior or exterior.

1.4 FINAL INSPECTION

- A. Reference: See General and Supplementary Conditions, titled "Final Adjustment And Completion".
- B. Final Inspection: When Contractor has complied with above Article, Architect will review the Work and list any items to be completed or corrected.
- C. Contractor shall correct and/or complete the Work.

1.5 GUARANTEES

- A. General: Contractor shall guarantee in writing to District that:
 - 1. "Contractor will repair or replace any and all work, together with any other work which may be displaced, damaged or marred in so doing, that may prove defective in workmanship and/or materials, or fail to conform to contract provisions and requirements within the period cited below, such period to begin on date of

acceptance of work by District, without any expense whatsoever to District, ordinary wear and tear, and unusual abuse or neglect excepted."

2. Format: Contractor shall submit guarantees typed in the format indicated in "Guarantee Form", See General Conditions Exhibit K.
3. Number of Copies: Submit in duplicate to Architect.
4. Required Guarantees:
5. General: Submit all guarantees listed herein or required by various Spec. Sections; more stringent shall apply. Guarantee periods begin at the date of acceptance written on the "Notice of Completion" as accepted by the School District Board of Education.
6. General Guarantee:
 - a. By General Contractor; For The Entire Work: 1 Year

1.6 WARRANTIES

- A. General: Submit all warranties required by various Spec. Sections.

1.7 CERTIFICATES

- A. General: Submit all certificates and Verified Reports required by various Spec. Sections or listed herein, notarized as required.

1.8 OPERATION & MAINTENANCE DATA

- A. General: Submit all manuals required by various General Conditions, Spec. Sections or listed herein; two copies each.

1.9 PROJECT RECORD DOCUMENTS

- A. See Section 01 77 20.
- B. Additional Information Required: In addition to the requirements in Section 01 77 20, provide the following:
 1. By measured dimensions (vertical and horizontal) from permanent improvements or buildings, locate the following new underground utilities, piping systems, and their appurtenances; and existing systems when known, uncovered, in work areas, adjacent to work areas, or modified as part of the work of this Project:
 - a. Site drainage systems piping and cleanouts.
 - b. Landscape sprinkler systems: Complete system, except non-pressure branch lines from automatic control valves to heads.
 - c. All fire protection systems.
 - d. All plumbing systems.
 - e. All electrical systems.

- f. All pool systems.
- 2. For gravity flow lines such as sewers and storm drains, locate all cleanouts, and indicate invert elevations at building lines, changes in direction, intersections, and property lines.
- 3. Electrical Underground: In addition to locations, state number and sizes of conduits and wires, and provide invert elevations.
- 4. Work Concealed Within Building Construction: Indicate by dimension the locations of Plumbing Systems, HVAC Systems, and Fire Protection Systems.
- 5. Show any work performed that deviates from original Contract Documents.
- 6. Show all work authorized by Change Order(s) and number of that Change Order.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

**SECTION 01 77 20
PROJECT RECORD DOCUMENTS**

PART 1 – GENERAL

1.1 SUMMARY

- A. Throughout progress of the Work of this Contract, maintain an accurate record of all changes in the Contract Documents, as described in 3.1 below.
- B. Contractor shall periodically transfer the recorded changes to a set of “as-built” documents, as described in Article 3.02 below, and submit such “as-builts” to Architect for Architect’s use as required.
- C. The Project Manager shall verify that as-builts are current, on a monthly basis, prior to the processing of pay requests. Pay Requests WILL NOT be processed unless the As-Builts have been verified.
- D. Related work described elsewhere: Section 01 33 00 “Submittal Procedures”.

1.2 QUALITY ASSURANCE

- A. General: Delegate the responsibility for maintenance of Record Documents to one person on the Contractor’s staff as approved in advance by the Architect.
- B. Accuracy of records: Thoroughly coordinate all changes within the Record Documents, making adequate and proper entries on each page of a clean set of Specifications and each sheet of Drawings and other Documents where such entry is required to properly show the change. Accuracy of records shall be such that future search for items shown in the Contract Document may reasonably rely on information obtained from the approved Record Documents.
- C. Timing of entries: make all entries within 24 hours after receipt of information.

1.3 SUBMITTALS

- A. General: The Architect’s approval of the current status of Record Documents will be a prerequisite to the Architect’s approval of requests for progress payment and request for final payment under the Contract.
- B. Progress submittals: Prior to submitting each request for progress payment, secure the Architect’s approval of the Record Documents as currently maintained.
- C. Final submittals: Prior to submitting request for final payment, submit the Final Record Documents to the Architect and secure his approval.

1.4 PRODUCT HANDLING

- A. Use all means necessary to maintain the job set of Record Documents completely protected from deterioration and from loss and damage until completion of the work and transfer of the recorded data to the Final Record Documents. In the event of loss of recorded data, use all means necessary to secure the data to the Architect’s approval; such means shall include, if necessary in the opinion of the Architect, removal and replacement of concealing materials and, in such case, all replacements shall be to the standards originally specified in the record Documents.

PART 2 – PRODUCTS

2.1 RECORD DOCUMENTS

- A. Promptly following award of Contract, mark one set of documents (blueines) as “RECORD DOCUMENTS-JOB SET”. All Addenda, issued during the Bid, shall be “cut and pasted” onto the appropriate sheets or pages of the Plans and Specifications.
 - 1. In addition to the requirements set forth, directing the Contractor to transfer all the information above to a reproducible set of prints and CAD disk, the Contractor shall provide the actual JOB SET (“marked-up prints”) referenced above to the District at the completion of construction, which will remain the District’s property.

PART 3 – EXECUTION

3.1 MAINTENANCE OF JOB SET

- A. Preservation:
 - 1. Considering the Contract completion time, the probable number of occasions upon which the job set must be taken out for new entries and for examination, and the conditions under which these activities will be performed devise a suitable method for protecting the “RECORD DOCUMENTS-JOB SET” to the approval of the Architect.
 - 2. Do not use the Job Set for any purpose except entry of new data and for review by the Architect, until start of transfer of data to Final Record Documents.
 - 3. Maintain the Job Set at the site of work where designated by the Architect.
- B. Making entries on drawings: Using an erasable colored pencil (not ink or indelible pencil) clearly describe the change by note and by graphic line, as required. Date all entries. Call attention to the entry by a “cloud” around the area or areas affected. In the event of overlapping changes, different colors may be used for each of the changes.
- C. Making entries on other documents:
 - 1. Where changes are caused by directives issued by the Architect, clearly indicate the change by note in ink, colored pencil, or rubber stamp.
 - 2. Where changes are caused by Contractor-originated proposals approved by the Architect, including inadvertent errors by the Contractor that have been accepted by the Architect, clearly indicate the change by note in erasable colored pencil.
 - 3. Make entries in the pertinent documents as approved by the Architect.
- D. Conversion of schematic layouts:
 - 1. In most cases on the Drawings, arrangement of conduits and circuits, piping, ducts, and other similar items is shown schematically and is not intended to portray precise physical layout. Final physical arrangement is as determined by the Contractor subject to the Architect’s approval. However, design of future modifications of the facility may require accurate information as to the final physical arrangement of items that are shown only schematically on the Drawings.

2. Show on the job set of Record Drawings, by dimension accurate to within 1", the centerline of each run of items such as are described in Paragraph 3.1 D.1 above. Clearly identify the item by accurate note such as "CAST-IRON DRAIN," "GALV. WATER" etc. Show by symbol or note the vertical location of the item ("under slab," "in ceiling plenum" "exposed," etc.). Make all identification sufficiently descriptive that it may be related reliably to the Specifications.
 3. The Architect may waive the requirements for conversion of schematic data where, in the Architect's judgment, such conversion serves no beneficial purpose. However, do not rely upon waivers being issued except as specifically issued in writing by the Architect.
 4. Timing of entries: Be alert to changes in the work from how it is shown in the Contract Documents. Promptly, and in no case later than 24 hours after the change has occurred and been made known to the Contractor, make the entry or entries required.
- E. Accuracy of entries: Use all means necessary, including the proper tools for measurement, to determine actual locations of the installed items.

3.2 FINAL RECORD DOCUMENTS

- A. General: The purpose of the Final Record Documents is to provide factual information regarding all aspects of the work, both concealed and visible, to enable future modification of design to proceed without lengthy and expensive site measurement, investigation, and examination.
- B. Approval of recorded data prior to transfer: Using the CAD disk and sepia vellums described in Section 01030, and prior to start of transfer of recorded data thereto, secure a review by the Architect and Project Manager of all recorded data. Make all required revisions.
- C. Transfer of data to drawings: Carefully transfer all change data shown on the job set of Record Drawings to the CAD disk and corresponding sepias, coordinating the changes as required, and clearly indicating at each affected detail and other drawing the full description of all changes made during construction and the actual location of items described in Paragraph 3.1 E. above. Call attention to each entry by drawing a "cloud" around the area or areas affected. Make all change entries on the sepias neatly, consistently, and in ink or crisp black pencil.
- D. Transfer of data to other Documents: If the documents other than Drawings have been kept clean successfully during progress of the work, and if entries have been sufficiently orderly thereon to the approval of the Architect, the job set of those Documents (other than Drawings) will be accepted by the Architect as Final Record Documents for those documents. If any such document is not so approved by the Architect, secure a new copy of that document from the Architect at the Architect's usual charge for reproduction; carefully transfer the change data to the new copy and to the approval of the Architect.
- E. Review and approval: Submit the completed total set of Record Documents to the Architect as described in Paragraphs 1.3 C. and 2.1 A, above. Participate in review meeting or meetings as required by the Architect, make all required changes in the Record Documents, sign and date Record Documents, and promptly deliver the Final Record Documents to the Architect.

3.3 CHANGES SUBSEQUENT TO ACCEPTANCE

- A. The Contractor shall have no responsibility for recording changes in the work subsequent to acceptance of the work by the District, except for changes resulting from replacements, repairs, and alterations made by the Contractor as part of his guarantee.

END OF SECTION

**SECTION 01 77 40
WARRANTIES**

PART 1 – GENERAL

1.1 SUBMITTAL REQUIREMENTS

- A. Assemble Warranties and Service and Maintenance Contracts, executed by each of the respective Manufacturers, Suppliers, and Subcontractors.
- B. Number of original signed copies required: Four (4) each.
- C. Table of Contents: Neatly typed in orderly sequence.
- D. Provide complete information for each one of the following items:
 - 1. Product or Work Item.
 - 2. Firm with name of principal, address, and telephone number.
 - 3. Beginning date of Warranty or Service and Maintenance Contract.
 - 4. Duration of Warranty or Service and Maintenance Contract.
 - 5. Provide the following information for the District's Personnel:
 - a. Procedures in case of failure of malfunction.
 - b. Instances which affect Warranty.
 - 6. Contractor, name of responsible principal, address, and telephone number.

1.2 SUBMITTAL FORM

- A. The list identifies the submittal form requirements for WARRANTIES:
 - 1. Punch sheets for standard 3-ring binder.
 - 2. Size: 8-1/2 x 11 inches.
 - 3. Fold larger sheets to fit into binder.
 - 4. Cover: Identify each packet with typed or printed title "WARRANTIES". List:
 - a. Title of Project.
 - b. Name of Contractor.

PART 2 – PRODUCTS

Not used

PART 3 – EXECUTION

Not used.

END OF SECTION

SECTION 01 78 23
OPERATION AND MAINTENANCE MANUALS

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Compilation of product data and related information appropriate for the District's maintenance and operation of products and equipment furnished under the Contract.
 - 2. Instruction of the District's personnel in the maintenance of products and in the operation of equipment and systems.
- B. Contractor shall comply with the requirements of this Specification Section, except where individual Specification Sections requirements are more stringent.

1.2 SUBMITTAL PROCEDURES

- A. Preliminary: Submit one copy of proposed manuals to the Project Manager at least fifteen (15) days prior to final inspection or acceptance.
- B. Final: Following the indoctrination and instruction of the District's operating and maintenance personnel, review proposed revisions to the manual with the Project Manager.
 - 1. Submit three copies of accepted data in final form 10 days after final inspection. Approval of submittal is a pre-requisite at Substantial Completion prior to the District's agendizing project for acceptance by the Governing Board.

PART 2 – PRODUCTS

2.1 FORMAT

- A. Size: minimum 4 inch three-ring binders for 8-1/2 inch by 11 inch punched pages, completely clear plastic covered for insertion of labels on spines and covers.
- B. Provide identifying tabbed pages. Classify by Division and by Section. All tabbing shall be in numerical order.
- C. Drawings:
 - 1. Provide reinforced punched binder tab. Bind drawings with text.
 - 2. Fan fold larger drawings to size of text pages, for easy foldout.
- D. Cover: Identify each volume with typed or printed label, List:
 - 1. Title of Project
 - 2. Identify of separate structures as applicable.
 - 3. Identify of general subject matter covered in the manual.

- E. Spine: Identify each volume with typed or printed label stating OPERATING AND MAINTENANCE INSTRUCTIONS, GUARANTEES AND SERVICE CONTRACTS and the following information:
 - 1. Title of Project.
 - 2. Divisions and Sections included within volume.
 - 3. Volume number (i.e. "1 of 4")

PART 3 – EXECUTION

3.1 CONTENT OF MANUAL

- A. Table of Contents:
 - 1. List of each product indexed to the content of the volume.
 - 2. List with each product the name, address, and the telephone number of:
 - a. Subcontractor and installer.
 - b. Maintenance contractor, as appropriate.
 - c. Local sources of supply for parts and replacement.
- B. Product Data: Annotate each sheet to clearly identify the data applicable to the installation. Delete references to inapplicable information
- C. Drawings:
 - 1. Supplement product data with Drawings as necessary to illustrate the following:
 - a. Relationship of component parts of equipment and systems.
 - b. Control and flow diagrams.
 - 2. Do not include Project Record Drawings as maintenance drawings.
- D. Instructions: Provide written text, as required to supplement product data for the particular installation.
- E. Warranties, Guaranties, Bonds, and Service Contracts: Include a copy of each warranty, guarantee, bond and service contract issued.
 - 1. Provide information sheet for the District's personnel describing the following:
 - a. Propose procedures in the event of failure or emergencies.
 - b. Circumstances under which the validity of warranties, guaranties, or bonds might be compromised.

3.2 MANUAL FOR MATERIALS AND FINISHES

- A. Instructions for Care and Maintenance: Include manufacturer's data as follows:
 - 1. Recommendations for types of cleaning agents and methods.

2. Cautions against cleaning agents and methods which are detrimental to the product.
3. Recommended schedule for cleaning and maintenance.

3.3 MANUAL FOR EQUIPMENT AND SYSTEMS

A. Content, for each unit of mechanical equipment and system, as appropriate:

1. Description of Unit and Component Parts:
 - a. Function, normal operating characteristics, and limiting conditions.
 - b. Performance curves, engineering data, and tests.
 - c. Complete nomenclature and commercial number of replacement parts.
2. Operating Procedures:
 - a. Start-up, break-in, routine, and normal operating instructions.
 - b. Regulation, control, stopping, shut-down, and emergency instructions.
 - c. Summer and winter operation instructions.
3. Maintenance Procedures:
 - a. Routine operations.
 - b. Guide to "trouble-shooting."
 - c. Disassembly, repair, and reassemble.
 - d. Alignment, adjusting, and checking.
4. Servicing and lubrication schedule including list of lubricants required.
5. Manufacturer's printed operating and maintenance Instructions.
6. Description of sequence of operation by control manufacturer.
7. Original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance, including:
 - a. Predicted life of parts subject to wear.
 - b. Items recommended to be stocked as spare parts.
8. Control diagrams by manufacturer of controls as installed in project.
9. Coordination Drawings and color coded piping diagrams.
10. Charts of valve tag numbers, with the location and function of each valve.

- B. Content, for each electric and electronic system as appropriate:
1. Description of System and Component Parts:
 - a. Function, normal operating characteristics, and limiting conditions.
 - b. Performance curves, engineering data, and tests.
 - c. Complete nomenclature and commercial number of replaceable parts.
 2. Circuit directories of panelboards:
 - a. Electrical service.
 - b. Controls.
 - c. Communication.
 3. As-installed color coded wiring diagrams.
 4. Operating Procedures:
 - a. Routine and normal operating instructions.
 - b. Sequences required.
 - c. Special operating instructions.
 5. Maintenance Procedures:
 - a. Routine operations.
 - b. Guide to "trouble-shooting."
 - c. Disassembly, repair and re-assembly.
 - d. Adjustment and checking.
 6. Manufacturer's printed Operating and Maintenance Instructions.
 7. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

3.4 INSTRUCTION OF THE DISTRICT'S PERSONNEL

- A. Prior to final inspection or acceptance, fully instruct the District's designated operating and maintenance personnel in the operation, adjustment and maintenance of all products, equipment, and systems installed in project.
1. Provide services of factory trained instructors from the manufacturer of each major item of equipment or system.

- B. Operating and maintenance manual shall constitute the basis of instruction.
1. Review contents of manual with personnel in full detail to explain all aspects of operation and maintenance.
 2. Review instruction on how to efficiently use state required energy conservation features, materials, components, and mechanical device.

END OF SECTION

SECTION 02 41 19 DEMOLITION

PART 1 – GENERAL

1.1 SUMMARY

- A. Provisions of the General and Supplementary Conditions and Division One apply to this section.
- B. Section Includes: Furnishing all labor, materials and equipment necessary for demolition, dismantling, cutting and alterations as indicated, specified, and required for completion of the Contract, as applicable. Includes items such as the following:
 - 1. Protecting existing work to remain.
 - 2. Cleaning soiled materials that are to remain.
 - 3. Disconnecting and capping utilities.
 - 4. Removing debris and equipment.
 - 5. Removal of items indicated on Drawings.
 - 6. Salvageable items to be retained by the Owner as indicated on the Drawings and during the pre-construction job walk.
- C. Related Sections:
 - 1. Section 01 50 00: Temporary Facilities and Controls.
 - 2. Section 31 10 00: Site Clearing.

1.2 QUALITY ASSURANCE

- A. Comply with the following:
 - 1. Applicable codes, ordinances, regulations of local, municipal, state and federal authorities having jurisdiction.
 - 2. Obtain necessary permits and notices, post where required.
 - 3. Comply with safety requirements of the local fire department.
 - 4. Comply with ANSI A10.6.
 - 5. Comply with Standard Specification for Public Works Const.
- B. Demolition Firm Qualifications: Engage an experienced, licensed firm having a minimum of (5) year's full time satisfactory experience in demolition work of similar scope and complexity to that indicated for this Project.
- C. Notify affected utility companies before starting Work and comply with their requirements.
- D. Carefully perform demolition work, by skilled workers experienced in building demolition procedures, using appropriate tools and equipment. Perform work, at all times, under the direct supervision of a supervisor approved by the Owner Inspector.
- E. Coordinate demolition with other trades to ensure correct sequence, limits, and methods of proposed demolition. Schedule work to create the least possible inconvenience to the public and to facility operations.
- F. Pre-Demolition: Conduct conference at Project site 7 days prior to scheduled installation.
 - 1. Conference agenda shall include review and discussion of requirements of authorities having jurisdiction, instructions and requirements of serving utilities, sequencing and interface considerations and Project conditions.

2. Conference shall be attended by supervisory and quality control personnel of Contractor and all subcontractors performing this and directly related work. Submit minutes of meeting to Owner's Representative for Project record purposes.

1.3 DEFINITIONS

- A. Remove: Remove and legally dispose of items except those indicated to be reinstalled, salvaged, or to remain the Owner's property.
- B. Remove and Salvage: Items indicated to be removed and salvaged remain the Owner's property. Remove, clean, and pack or crate items to protect against damage. Identify contents of containers and deliver to location as directed by Owner's Representative.
- C. Remove and reinstall items indicated; clean, service, and otherwise prepare them for reuse; store and protect against damage. Reinstall items in locations indicated.
- D. Existing to Remain: Protect construction indicated to remain against damage and soiling during demolition. When permitted by the Owner's Representative, items may be removed to a suitable, protected storage location during demolition and then cleaned and reinstalled in their original locations.

1.4 OWNERSHIP OF MATERIALS

- A. Ownership of Materials: Except for items or materials indicated to be reused, salvaged, or otherwise indicated to remain the Owner's property, demolished materials shall become the Contractor's property and shall be removed from the site with further disposition at the Contractor's option.

1.5 PROJECT CONDITIONS

- A. Drawings may not indicate in detail all demolition work to be carried out. Carefully examine existing conditions to determine full extent of demolition required. All utilities, whether shown on the drawings or not, to be capped at the property line U.N.O.
- B. Repair damage due to demolition activities to existing improvements to remain at no additional cost to the Owner. Repair or replace as directed by the Owner Inspector.
- C. Take measures to avoid excessive damage from inadequate or improper means and methods, or improper shoring, bracing or support. Repair or replace any resulting damage at no additional cost to the owner as directed by the Owner Inspector.
- D. If conditions are encountered that vary from those indicated, notify the Owner Inspector for instructions prior to proceeding. Owner assumes no responsibility for actual condition of structures to be demolished.
- E. Inform Owner immediately upon discovery of asbestos products, radioactive materials, toxic wastes or other hazardous materials. Do not remove hazardous materials without Owner authorization.
- F. Adjacent roadways/passageways:
 - 1. Maintain fire department access through all phases of the project.
 - 2. Obstruction of streets, walks or other adjacent facilities will not be allowed.

1.6 DIG ALERT NOTIFICATION

- A. Before any excavation in or near the public right-of-way, the Contractor must contact the Underground Service Alert of Southern California (Dig Alert) at 811 for information on buried utilities and pipelines.
- B. Delineation of the proposed excavation site is mandatory. Mark the area to be excavated with water soluble or chalk based white paint on paved surfaces or with other suitable markings such as flags or stakes on unpaved areas.
- C. Call at least Two (2) full working days prior to digging.
- D. If the members (utility companies) have facilities within the work area, they will mark them prior to the start of your excavation and if not, they will let you know there is no conflict. A different color is used for each utility type (electricity is marked in red, gas in yellow, water in blue, sewer in green, telephone and cable TV in orange).
- E. The Law requires you to hand expose to the point of no conflict 24" (inches) on either side of the underground facility, so you know its exact location before using power equipment.
- F. If caught digging without a Dig Alert ticket you can be fined as much as \$50,000 per California government code 4216.

PART 2 – PRODUCTS

2.1 SOIL MATERIALS

- A. Satisfactory Soil Materials: Soils approved by the testing geotechnical engineer and free of rock or gravel larger than 4 inches in any dimension, debris, waste, vegetation and other deleterious matter and as approved by the Geotechnical Engineer. Rocks or hard lumps larger than approximately 4 inches in diameter should be broken into smaller pieces or should be removed from the site. It is anticipated that most of the on-site soils may be reusable as engineered fill after any vegetation, construction debris, oversized material and deleterious material is removed from the site.
- B. Backfill & Native Fill Materials: The on-site soils may be reused as compacted engineered fill provided they comply to the requirements of "Satisfactory Soil Materials", as described above.
- C. Borrow / Imported Fill Material: Soil excavated from site or imported conforming to requirements for fill material.
- D. Materials for the fill shall be free from vegetable matter and other deleterious substances, shall not contain rocks or lumps of a greater dimension than is recommended by the geotechnical consultant, and shall be approved by the geotechnical consultant.
- E. Imported materials should have a Plasticity Index (PI) not less than 5 nor greater than 15, as determined by ASTM D 4318; and expansion index not exceeding 10, as determined by ASTM D 4829; and a particle size not exceeding 3 inches as determined by ASTM D 422.
- F. Engineered Fill: Satisfactory Soil Materials / Borrow Fill Material, as described above, placed in lifts no greater than 8 inches thick (loose measurements), and compacted to a minimum of 90% of the soil's maximum dry unit weight.

G. Backfill Material for Trenches:

1. The on-site soils may be used for backfilling utility trenches from one foot above the top of pipe to the surface, provided the material is free of organic matter and deleterious substances. Any soft and/or loose materials or fill encountered at pipe invert should be removed and replaced with properly compacted fill or adequate bedding material. Also, rocks larger than 6 inches and boulders should not be used as backfill.

2.2 HANDLING OF MATERIALS

- A. Items scheduled for salvage by the Owner shall be delivered to a location designated by the Owner's Authorized Representative. Items shall be cleaned, packaged and labeled for storage.
- B. Items scheduled for reuse shall be stored on site and protected from damage, soiling and theft.

PART 3 – EXECUTION

3.1 GENERAL

- A. Protection: Do not begin demolition until safety partitions, barricades, warning signs and other forms of protection are installed. Provide safeguards, including warning signs, lights and barricades, for protection of occupants and the general public during demolition. Provide and maintain fire extinguishers. Comply with requirements of governing authorities. Maintain existing utilities, which are to remain in service and protect from damage during operations.
- B. Safety: If at any time safety of existing construction appears to be endangered, take immediate measures to correct such conditions; cease operations and immediately notify the Owner Inspector. Do not resume demolition until directed by the Owner Inspector.
- C. Noise and Dust Abatement: Exercise all reasonable and necessary means to abate dust, dirt rising and undue noise. Perform necessary sprinkling and wetting of construction site to allay dust as required by applicable codes and ordinances.
- D. Dust Control: Use water mist, temporary enclosures, and other suitable methods to limit the spread of dust and dirt. Comply with governing environmental protection regulations. Do not create hazardous or objectionable conditions, such as flooding and pollution, when using water.
- E. Water for Dust Control: Contractor shall obtain and pay for all water required for his dust control operations. This may include, but is not limited to, payment of deposits to utility for construction meter, and payment of all monthly service and water charges. Construction meter shall be in place throughout construction period unless alternative arrangements are made with the Water Department to provide construction water for all purposes. Contractor shall be aware of water moratoriums and restrictions, and shall immediately advise Owner of effects on construction schedules.
- F. An 8 foot high, chain link fence, with visual screen and gates, shall be erected prior to any demolition operations at the construction limits perimeter. Coordinate the exact location with Owner. Comply with specification section 32 31 13: Chain Link Fence.
- G. Debris Removal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level.

- H. Progress Cleaning: Clean adjacent buildings and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing before start of demolition.

3.2 PREPARATION

- A. Prevent movement or settlement of adjacent structures. Provide bracing and shoring as necessary.
- B. Utilities:
 - 1. The Drawings do not purport to show all below-grade conditions and objects on the site. Contractor shall perform field investigations as necessary to establish location of underground utility services and other features affecting earthwork.
 - 2. Mark location of underground utilities on asphalt pavement with paint.
 - 3. Disconnect and cap utility services; comply with requirement of governing authorities.
 - 4. Contractor shall arrange and notify utility company in advance of date and time when service needs to be disconnected. Do not commence demolition operations until associated disconnections have been completed. Should utilities and other below-grade conditions be encountered which adversely affect the work, discontinue affected work, notify Owner's Representative and Architect, and request direction. Unforeseen conditions will be resolved in accordance with provisions of the General Conditions of the Contract. Should a utility line or structure be damaged, immediately notify the responsible utility company or agency and notify Owner's Representative and Architect. Repair or replace all damaged utility lines and structures as directed by the responsible utility company or agency. Repair or replacement of damaged utility lines and structures whole location or existence has been made known to the Contractor shall be at no change in the Contract Time and Contract Price.
- C. Structures to be demolished shall be inspected for hazardous materials. Such materials shall be removed and disposed of before general demolition begins.
- D. Do not interrupt existing utilities serving occupied or operating facilities, except when authorized in writing by Owner's Representative and Authority Having Jurisdiction (AHJ). Provide temporary services during interruptions to existing utilities, as acceptable to Owner's Representative and to Authority Having Jurisdiction (AHJ).

3.3 EXPLOSIVES

- A. Explosives: Use of explosives will not be permitted.

3.4 DEMOLITION

- A. Demolition, General:
 - 1. With certain exceptions, the Contractor shall raze, remove and dispose of all structures, paving, fences and other obstructions that lie wholly or partially within the construction limits identified on Drawings. The exceptions are utility-owned equipment and any other items the Owner/Documents may direct the Contractor to leave intact or re-use onsite. Cease demolition immediately if adjacent structures appear to be in danger.

2. Conduct demolition operations and remove debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
3. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner's Representative and Authority Having Jurisdiction (AHJ). Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
4. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around demolition area.
 - a. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
 - b. Protect existing site improvements, appurtenances, and landscaping to remain.
 - c. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
5. Structural Stability: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of buildings to be demolished and adjacent buildings to remain. Strengthen or add new supports when required during progress of demolition.
6. Below-Grade Construction: Demolish foundation walls and other below-grade construction, as follows:
 - a. Remove below-grade construction, including foundation walls and footings, to at least 18-inches below grade, but at least to bottom of footing or foundation wall.
 - b. Completely remove below-grade construction, including foundation walls and footings.
7. Filling Below-Grade Areas: Completely fill below-grade areas and voids resulting from demolition of buildings and pavements with soil materials according to requirements specified in Section 31 20 00 - Earthwork.
8. Damages: Promptly repair damages to adjacent facilities caused by demolition operations.
9. Unless otherwise indicated on the plans, remove all demolished material from the site and dispose of at approved disposal sites. Comply with all requirements for recycling of demolished material as called for in Division 1 of this Specification. The contractor shall obtain necessary permits for the transportation of material from the site.

3.5 REMOVAL OF EXISTING PLUMBING AND ELECTRICAL EQUIPMENT AND SERVICES

- A. Remove existing plumbing and electrical equipment fixtures and services not indicated for reuse and not necessary for completion of work. Remove abandoned lines and cap unused portions of existing lines. The Contractor is responsible for completely surveying the site and locating all existing utilities, above and below ground, before contracting to perform the work.

- B. Asbestos – Cement (A-C) Pipe Removal and Disposal: The plans for the project may indicate that existing asbestos-cement pipe is to be removed from the ground. Where so indicated the Contractor shall excavate with care, expose the pipeline and remove the A-C pipe to the nearest joint. Should the plans not call out the removal of the A-C pipe and A-C pipe is encountered, the Contractor shall obtain approval from the Owner as to whether or not the A-C pipe is to be removed or can be left in place. Cutting of the pipe shall only be done if absolutely there is no other way to expose the length of pipe to the nearest joint that be separated and the Owner approves the cutting of the pipe. Cutting of the pipe shall be done with a mechanical saw with a pressure water source to dampen the pipe and the dust from the cutting. To remove a coupling, the coupling may have to be broken in the trench. The pipe once removed from the trench may be broken for handling. The breaking shall be done within a plastic bagging or sheeting material to minimize the release of asbestos fibers into the atmosphere. Once removed and broken, if necessary, the A-C material shall be bagged and disposed of legally with the Owner to be given a copy of all Contractor paperwork as to the legal disposal of the material. If the A-C pipe section(s) are removed intact the pipe can be removed by the Contractor from the project site and become the property and responsibility of the Contractor.

3.6 CLEANING

- A. Clean existing materials to remain, using appropriate tools and materials.
- B. Protect adjacent materials and equipment during cleaning operations.

3.7 PATCHING AND RESTORATION

- A. Patching: Where removals leave holes and damaged surfaces that will be exposed in the completed construction, such holes and damaged surfaces shall be patched and restored to match adjacent finished surfaces.
1. Where new finish construction is applied over existing holes and damaged surfaces, patching and restoration shall be performed to the extent to make the substrate suitable for the provision of new finish construction.
 2. Surfaces of patched and restored areas shall be flush with the adjacent existing surfaces and shall closely match existing adjacent surfaces in texture and finish.
- B. Restoration of Site Finishes:
1. Concrete paving: Where it is necessary to excavate a trench across make a cut in concrete paved areas, cut concrete cutting saw, full depth of paving.
 2. Bituminous paving: Where it is necessary to excavate a trench across make a cut in bituminous paved areas, either first score paving with a concrete cutting saw, in neat straight lines, prior to removing paving or make straight cuts with pneumatic spade.
 3. Restoration of paving: Restore all paved areas to their original condition using material of like type and quality as the removed paving. Paving in public ways shall conform to applicable requirements of authorities having jurisdiction. Repaired surfaces shall match existing adjacent paving except minimum depth shall be 3-1/2 inches where existing paving is less than 3-1/2 inches.
 4. Restoration of landscape planting: Restore soil and plant materials to match original condition, including additional topsoil, topsoil grading and preparation, new plant materials and plant maintenance during establishment period.

3.8 MAINTENANCE

- A. Install and maintain all erosion control devices, including sandbag and gravel bag dikes, silt fences, de-silting basins, inlet barricades, vehicle wash traps, and other features as required per Specification Section 01060.

3.9 CLEAN-UP/DISPOSAL

- A. Coordinate building access with the Owner Inspector. Review and schedule waste storage and removal, include truck access to site.
- B. Debris shall be dampened by fog water spray prior to transporting by truck.
- C. Debris pick-up area shall be kept broom-clean and shall be washed daily with clean water.
- D. Remove waste and debris, other than items to be salvaged. Turn over salvaged items to Owner, or store and protect for reuse where scheduled. Continuously clean-up and remove items as demolition work progresses. Do not allow waste and debris to accumulate in building or on site.

END OF SECTION

**SECTION 03 10 00
CONCRETE FORMING AND ACCESSORIES**

PART 1 – GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Formwork for cast-in-place concrete as indicated.
 - 2. Installation of items to be embedded in concrete, such as anchor bolts, inserts, embeds, and sleeves.
- B. Related Requirements:
 - 1. Division 01 - General Requirements.
 - 2. Section 03 2000: Concrete Reinforcing.
 - 3. Section 03 3000: Cast-In-Place Concrete.

1.02 REFERENCES

- A. American Concrete Institute (ACI) Publication:
 - 1. ACI 318 – Building Code Requirements for Structural Concrete, Chapter 6, Formwork, Embedded Pipes, and Construction Joints.
 - 2. ACI 347 – Guide to Formwork for Concrete.
- B. American Plywood Association (APA):
 - 1. Form No. V345 - Concrete Forming Design/Construction Guide.
- C. National Institute of Standards and Technology (NIST):
 - 1. NIST Voluntary Product Standard PS 1.

1.03 SUBMITTALS

- A. For falsework and shoring submit layout signed by California registered Civil Engineer, manufacturer's authorized representative or a licensed contractor experienced in the usage and erection of falsework and vertical shoring. A copy of the plans and calculation shall be available at the jobsite at all times.
- B. Product Data: Submit manufacturer's Product Data for form materials and accessories.

1.04 REGULATORY REQUIREMENTS

- A. California Building Code (CBC), Chapter 19A.
- B. California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 4, Construction Safety Orders, Article 6, Excavations, Sections 1713 and 1717.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Storage shall prevent damage and permit access to materials for inspection and identification.

PART 2 – PRODUCTS

2.01 GENERAL

- A. Form materials may be reused during progress of the Work provided they are completely cleaned and reconditioned, recoated for each use, capable of producing formwork of required quality, and are structurally sound.
- B. Form Lumber: WCLIB Construction Grade or Better, WWPA No. 1 or Better.
- C. Plywood: NIST Voluntary Product Standard PS 1, Group 1, Exterior Grade B-B Plyform or better, minimum 5-ply and 3/4 inch thick for exposed locations and at least 5/8 inch thick for unexposed locations, grade marked, not mill oiled. Furnished plywood with medium or high density overlay is permitted.
- D. Coated Form Plywood: For exposed painted concrete, plastic overlaid plywood of grade specified above, factory coated with a form coating and release agent Nox-crete", or equal.
- E. Special Forms: For exposed integrally-colored concrete, plywood as above with high density overlay, plywood with integral structural hardboard facing or fibrous glass reinforced plastic facing, providing specified finish.
- F. For Exposed Concrete Finish:
 - 1. Plywood: New, waterproof, synthetic resin bonded, exterior type Douglas fir or Southern pine plywood manufactured especially for concrete formwork and conforming to NIST Voluntary Product Standard PS 1, Grade B-B grade, Class I.
 - 2. Plywood: "Finland Form,," "Combi Form" by North American Plywood Corporation, "Plyform" by Roy O. Martin, "ProForm" by Pacific Wood Laminates, or equal. The material shall be furnished with hard smooth birch face veneers with phenolic resin thermally fused onto panel sides. Edges shall be factory sealed.
- G. Form Ties: Prefabricated rod, flat band, wire, internally threaded disconnecting type, not leaving metal within 1 1/2-inch of concrete surface.
- H. Form Coating: Non-staining clear coating free from oil, silicone, wax, not grain-raising, "Formshield" by A.C. Horn, Inc., "Release" by Edoco/Dayton Superior, "Cast- Off" by Sonneborn/BASF Building Systems or equal. Where form liners are furnished, provide form coatings recommended by form liner manufacturer.

PART 3 - EXECUTION

3.01 GENERAL

- A. Forms shall be constructed so as to shape final concrete structure conforming to shape, lines and dimensions of members required by Drawings and Specifications, and shall be sufficiently tight to prevent leakage of mortar. They shall be properly braced or tied together to maintain position and shape. Forms and their supports shall be designed so that previously placed structures will not be damaged.
- B. Use form coating at all surfaces in contact with concrete.

3.02 TOLERANCES

- A. Permitted abrupt or gradual irregularities in formed surfaces as measured within a 5 feet length with a straightedge shall per ACI 347, Table 3.1:

Class of Surface			
A	B	C	D
1/8 inch	1/4 inch	1/2 inch	1 inch

1. Class A: Use for concrete surfaces prominently exposed to public view.
2. Class B: Use for coarse-textured concrete-formed surfaces intended to receive plaster, stucco or wainscoting.
3. Class C: Use as a general standard for permanently exposed surfaces where other finishes are not specified.
4. Class D: Use for surfaces where roughness is not objectionable and will be permanently concealed.

3.03 ERECTION

- A. Plywood shall be installed with horizontal joints level, vertical joints plumb and with joints tight. Back joints by studs or solid blocking, and fill where necessary for smoothness. Reused plywood shall be thoroughly cleaned, damaged edges or surfaces repaired and both sides and edges oiled with colorless form oil. Nail plywood along edges, and to intermediate supports, with common wire nails spaced as necessary to maintain alignment and prevent warping.
- B. Openings for Cleaning: Provide temporary openings at points in formwork to facilitate cleaning and inspection. At base of walls and wide piers, bottom form board on one face for entire length shall be omitted until form has been cleaned and inspected.
- C. Chamfers: Provide 3/4 inch by 3/4 inch chamfer strips for all exposed concrete corners and edges unless otherwise indicated.
- D. Reglets and Rebates: As specified in Section 03 3000: Cast-In-Place Concrete.

3.04 REMOVAL OF FORMS

- A. Forms shall not be removed until concrete has sufficiently hydrated to maintain its integrity and not be damaged by form removal operations. Unless noted otherwise and/or permitted by the Architect, columns and wall forms shall not be removed in less than five days, floor slabs in less than seven days, beams and girders in less than 15 days, pan forms for joists may be removed after three days, but joist centering shall not be removed until after 15 days, and ramp, landing, steps and floor slabs shall not be removed in less than seven days. Shoring shall not be removed until member has acquired sufficient strength to support its weight, load upon it, and added load of construction.
- B. Compressive strength of in-place concrete shall be determined by testing field-cured specimens representative of concrete location or members, as specified in Section 03 3000: Cast-In-Place Concrete.

3.05 PROTECTION

- A. Protect the Work of this section until Substantial Completion.

3.06 CLEAN UP

- A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

END OF SECTION

**SECTION 03 20 00
CONCRETE REINFORCING**

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Concrete steel reinforcement.

B. Related Requirements:

1. Section 01 45 29: Testing and Inspection.
2. Section 03 10 00: Concrete Forming.
3. Section 03 30 00: Cast-In-Place Concrete.
4. Section 04 22 00: Concrete Unit Masonry.

1.02 REGULATORY REQUIREMENTS

- A. Fabrication and placement of reinforcing shall be in accordance with requirements of CBC, Chapter 19A.

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. ASTM A82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
2. ASTM A496 - Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement.
3. ASTM A497 - Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete.
4. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
5. ASTM A706 - Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.

B. American Concrete Institute (ACI) Publication:

1. ACI SP-66 – ACI Detailing Manual.
2. ACI 318 – Building Code Requirements for Structural Concrete, as modified by CBC.

C. American Welding Society (AWS):

1. AWS D1.4 – Structural Welding Code – Reinforcing Steel.

1.04 SUBMITTALS

- A. Shop Drawings: Submit steel reinforcement Shop Drawings in accordance with ACI 315. Include assembly diagrams, bending charts and slab plans. Indicate lengths and location of splices, size and lengths of reinforcing steel.
- B. Closeout Submittals: Record exact locations of reinforcing that vary from Shop Drawings.

1.05 QUALITY ASSURANCE

- A. Comply with the following as a minimum requirement:
 - 1. Concrete Reinforcing Steel Institute (CRSI) Manual of Standard Practice.
 - 2. American Welding Society (AWS).
 - 3. American Concrete Institute (ACI).
 - 4. CBC, Chapter 19A, Concrete.
- B. Source Quality Control: Refer to Division 01 Sections for general requirements and to the following paragraphs for specific procedures. Testing laboratory retained by the OWNER shall select test Samples of bars, ties, and stirrups from the material at the Project Site or from the place of distribution, with each Sample consisting of not less than two 18 inch long pieces, and perform the following tests according to ASTM A615, or ASTM A706, as applicable:
 - 1. Identified Bars: If Samples are obtained from bundles as delivered from the mill, identified as to heat number, accompanied by mill analyses and mill test reports, and properly tagged with the identification certificate so as to be readily identified, perform one tensile and one bend test for each 10 tons or fraction thereof of each size of bars. Submit mill reports when Samples are selected.
 - 2. Unidentified Bars: When positive identification of reinforcing bars cannot be performed and when random Samples are obtained; perform tests for each 2.5 tons or fraction thereof, one tensile and one bend test from each size of bars.
- C. Certification of Welders: Shop and Project site welding shall be performed by welding operators certified by AWS.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Avoid exposure to dirt, moisture or conditions harmful to reinforcing.
- B. Reinforcing steel bars, wire, and wire fabric shall be stored on the Project site to permit easy access for examination and identification of each shipment. Material of each shipment shall be separated for size and shape.

PART 2 – PRODUCTS

2.01 GENERAL

- A. Provide reinforcing of sizes, gages and lengths indicated, bent to indicated shapes.

2.02 MATERIALS

- A. Steel Reinforcing Bars: ASTM A615, or ASTM A706 deformed grade 60 billet steel unless otherwise specified or indicated.
- B. Welded Wire Fabric for Reinforcement: ASTM A185.
- C. Tie Wire: ASTM A82, fully annealed, copper-bearing steel wire, 16 gage minimum.
- D. Chairs, Spacers, Supports, and Other Accessories: Standard manufacture conforming to ACI 315 fabricated from steel wire of required types and sizes. For reinforcement supported from grade, provide properly sized dense precast blocks of concrete.

2.03 FABRICATION OF REINFORCING BARS

- A. Comply with CRSI Manual of Standard Practice for Reinforced Concrete Construction for fabrication of reinforcing steel.
- B. Bending and Forming: Fabricate bars of the indicated sizes and bend and form to required shapes and lengths by methods not injurious to materials. Do not heat reinforcement for bending. Bend bars No. 6 size and larger in the shop only. Bars with unscheduled kinks or bends are not permitted. Provide only tested and permitted bar materials.
- C. Welding: Provide only ASTM A706 steel where welding is indicated. Perform welding by the direct electric arc process in accordance with AWS D1.4 and specified low-hydrogen electrodes. Preheat 6 inches each side of joint. Protect joints from drafts during the cooling process; accelerated cooling is not permitted. Do not tack weld bars. Clean metal surfaces to be welded of loose scale and foreign material. Clean welds each time electrode is changed and chip burned edges before placing welds. When wire brushed, the completed welds must exhibit uniform section, smooth welded metal, feather edges without undercuts or overlays, freedom from porosity and clinkers, and good fusion and penetration into the base metal. Cut out welds or parts of welds deemed defective, using chisel, and replace with proper welding. Prequalification of welds shall be in accordance with CBC requirements.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Bars shall be bent cold. Bars partially embedded in concrete shall not be field bent except as indicated on reviewed Shop Drawings.
- B. Before installation and just prior to placing concrete, clean reinforcing of loose scale, rust, oil, dirt and any coating that could reduce bond.
- C. Accurately position, install, and secure reinforcing to prevent displacement during the placement of concrete.
- D. Provide metal chairs to hold reinforcement the required distance above form bottoms. In beams and slab construction, provide chairs under top slab reinforcement as well as under bottom reinforcement. Space chairs so that reinforcement will not be displaced during installation. Provide metal spacers to secure proper spacing. Stirrups shall be accurately and securely wired to bars at both top and bottom. At slabs, footings, and beams in contact with earth, provide concrete blocks to support reinforcement at required distance above grade.
- E. Install and secure reinforcement to maintain required clearance between parallel bars and between bars and forms. Lapped splices shall be installed wherever possible in a manner to provide required clearance between sets of bars. Stagger lapped splices. Dowels and bars extending through construction joints shall be secured in position against displacement before

concrete is installed and subsequently cleaned of concrete encrustations while they are still soft.

- F. Do not install reinforcing in supported slabs and beams until walls and columns have been installed to underside of slabs and beams or until construction joints have been thoroughly cleaned. Reinforcing shall be inspected before placement of concrete and cleaned as required.
- G. Use deformed bars unless otherwise indicated, except for spiral reinforcement.

3.02 CLEAN UP

- A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

3.03 PROTECTION

- A. Protect the Work of this section until Substantial Completion.

END OF SECTION

**SECTION 03 30 00
CAST-IN-PLACE CONCRETE**

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Cast-in-place normal weight and lightweight concrete, placement and finishing.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 32 1313: Site Concrete Work.
3. Section 03 1000: Concrete Forming and Accessories.
4. Section 03 2000: Concrete Reinforcing.

1.02 REFERENCES

A. American Concrete Institute (ACI) Publication:

1. ACI 117 – Specifications for Tolerances for Concrete Construction and Materials.
2. ACI 301 – Specifications for Structural Concrete.
3. ACI 302.1R – Guide for Concrete Floor and Slab Construction.
4. ACI 305R - Specification for Hot Weather Concreting.
5. ACI 306.1 – Standard Specification for Cold Weather Concreting.
6. ACI 308R – Guide to External Curing of Concrete.
7. ACI 318 - Building Code Requirements for Structural Concrete, as modified by CBC Sections 1903A and 1905A.

B. American Society for Testing and Materials (ASTM) Standards:

1. ASTM C31 – Standard Specification for Making and Curing Concrete Test Specimens in the Field.
2. ASTM C33 - Standard Specification for Concrete Aggregates.
3. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
4. ASTM C42 - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.

5. ASTM C88 - Standard Test Method for Soundness of Aggregates by use of Sodium Sulphate or Magnesium Sulphate.
6. ASTM C94 - Standard Specification for Ready-Mixed Concrete.
7. ASTM C143 - Standard Test Method for Slump of Hydraulic Cement Concrete.
8. ASTM C150 - Standard Specification for Portland Cement.
9. ASTM C156 – Standard Test Method for Water Loss (from a Mortar Specimen) Through Liquid membrane-Forming Curing Compounds for Concrete.
10. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete.
11. ASTM C172 – Standard Practice for Sampling Freshly Mixed Concrete.
12. ASTM C173 – Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
13. ASTM C260 – Standard Specification for Air-Entraining Admixtures for Concrete.
14. ASTM C289 - Standard Test Method for Potential Alkali-Silica Reactivity of Aggregates (Chemical Method).
15. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
16. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.
17. ASTM C567 - Standard Test Method for Determining Density of Structural Lightweight Concrete.
18. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
19. ASTM C845 - Standard Specification for Expansive Hydraulic Cement
20. ASTM C989 - Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars.
21. ASTM C1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
22. ASTM C1064 - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
23. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.
24. ASTM C1315 – Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
25. ASTM D1308 – Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
26. ASTM C1567 - Standard Test Method for Determining the Potential Alkali- Silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated

Mortar-Bar Method).

27. ASTM D1751 - Standard Test Method for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).
28. ASTM D7234 – Standard Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers.
29. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
30. ASTM E1155 - Standard Test Method for Determining *FF* Floor Flatness and *FL* Floor Levelness Numbers.
31. 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.
32. ASTM E1745 - Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
33. ASTM F710 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
34. ASTM F1869 – Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

1.03

SUBMITTALS

- A. Shop Drawings: Submit Shop Drawings indicating locations of cast-in-place concrete Work and accessory items such as vapor barriers. Include details and locations of reinforcing, embedded items, and interfacing with other Work.
- B. Mix Design Data: Submit concrete mix designs as specified herein and in Article 2.02.
 1. Submit name, address and telephone number of the concrete production facility which the contractor intends to engage to design the concrete mixes. Submit name and qualifications of the proposed concrete technologist.
 2. Mix Design: Submit a concrete mix design for each strength and type of concrete indicated in the drawings or specified. Include water/cement ratio, source, size and amount of coarse aggregate and admixtures. Predict minimum compressive strength, maximum slump and air content percentage. Clearly indicate locations where each mix design will be used.
 3. Water/cement ration for concrete slabs on grade shall be 0.50 maximum.
 4. Test Reports: Submit copies of test reports showing that the proposed mixes produce concrete with the strengths and properties specified. Include tests for cement, aggregates and admixtures. Provide gradation analysis.
- C. Material Samples: Submit Samples illustrating concrete finishes and hardeners, minimum 12-inch by 12-inch.
- D. Certificates: Submit certification that each of the following conforms to the standards indicated:

1. Portland cement: ASTM C150.
 2. Normal weight concrete aggregates: ASTM C33.
 3. Aggregates: Submit evidence that the aggregate is not reactive in the presence of cement alkalis. In the absence of evidence, aggregate shall be tested by one of the methods in ASTM C33 Appendix XI, Methods for Evaluating Potential for Deleterious Expansion Due to Alkali Reactivity of an Aggregate. . Aggregates deemed to be deleterious or potentially deleterious may be used with the addition of a material that has been shown to prevent harmful expansion in accordance with Appendix XI of ASTM C33, when approved by the building official, in accordance to CBC Section 1903A5A.
 4. Curing materials: ASTM C171.
- E. Admixtures: Submit product data for proposed concrete admixtures.

1.04 QUALITY ASSURANCE

- A. Continuous inspection shall be provided at the batch plant and for transit-mixed concrete to run check sieve analysis of aggregate, check moisture content of fine aggregate, check design of mix, check cement being used with test reports, check loading of mixer trucks, and certify to quantities of materials placed in each mixer truck.
- B. Inspection shall be performed by a representative of a testing laboratory selected by the OWNER. OWNER will pay for inspection costs. Notify the laboratory 24 hours in advance of time concrete is to be mixed. Notify the laboratory of postponement or cancellation of mixing within at least 24 hours of scheduling time.
- C. CONTRACTOR shall assist the testing laboratory in obtaining and handling samples at the project site and at the source of materials.
- D. Continuous batch plant inspection requirement may be waived in accordance with CBC Section 1705A.3.3.1. Waiver shall be in writing, including DSA approval. When batch plant inspection is waived by DSA, the following requirements shall be met:
 1. Approved inspector of the testing laboratory shall check the first batching at the start of work and furnish mix proportions to the licensed weightmaster.
 2. Licensed weightmaster shall positively identify materials as to quantity and certify to each load by a ticket.
 3. Tickets shall be transmitted to the Inspector by a truck driver with load identified thereon. The Inspector will not accept the load without a load ticket identifying the mix and will keep a daily record of placements, identifying each truck, its load and time of receipt and approximate location of deposit in the structure and will transmit a copy of the daily record to DSA.
 4. At the end of the project, the weightmaster shall furnish an affidavit to DSA certifying that all concrete furnished conforms in every particular to proportions established by mix designs.
- E. Special Inspections and Tests shall be in accordance with CBC Chapter 17A, Reinforcement and Anchor testing per CBC Section 1910A and Specification Section 01 4523.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Store cement and aggregate materials so as to prevent their deterioration or intrusion by foreign matter. Deteriorated or contaminated materials shall not be furnished.
 - B. Packaged materials shall bear the manufacturers and brand name label, and shall be stored in their original unbroken package in a weather tight place until ready for use in the work.
- 1.06 PROJECT CONDITIONS
- A. Cold Weather Requirements: Batching, mixing, delivering and placing of concrete in cold weather shall comply with the applicable requirements of ACI306.1.
 - B. Hot Weather Requirements: Batching, mixing, delivering and placing of concrete in hot weather shall comply with the applicable requirements of ACI305R.
 - C. Concrete temperature of freshly mixed concrete shall be determined per ASTM C1064.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Cement: ASTM C150. Portland Cement.
- B. Aggregates: Conform to the following standards:
 - 1. Normal weight concrete: ASTM C33.
 - 2. Aggregate shall be tested for Potential Alkali Reactivity of Cement-Aggregate Combinations per ASTM C289.
 - 3. Nominal maximum size of coarse aggregate shall be no larger than:
 - a. 1/5 the narrowest dimension between sides of forms, nor
 - b. 1/3 the depth of slabs, nor
 - c. 3/4 the clear spacing between individual reinforcing bars or wires, bundles of bars, individual tendons, or ducts.
 - d. CONTRACTOR may request the ARCHITECT and DSA waiver of the above limitations reported per ACI 318, provided that the workability and methods of consolidation are such that the concrete can be placed without honeycombs or voids.
- C. Water: Water for concrete mixes, curing and cleaning shall be potable and free from deleterious matter.
- D. Admixtures: Shall be shown capable of maintaining essentially the same composition and performance throughout the work as the product used in establishing concrete proportions in accordance with ACI 318, Section 3.6.
 - 1. Admixtures containing chlorides or sulfides are not permitted.
 - 2. Air-entraining admixtures shall comply with ASTM C260.
 - 3. Air-entrained admixtures shall not be used for floor slabs to receive steel trowel finish.

4. Admixtures for water reduction and setting time modification shall conform to ASTM C494.
5. Admixtures for producing flowing concrete shall conform to ASTM C1017.
6. Fly ash, pozzolan and ground granulated blast-furnace slag: Modify ACI 318 Sections 3.6.6 and 3.6.7 as follows:
 - a. Fly ash or other pozzolan used as a partial substitution for ASTM C150 Portland cement shall meet the following requirements:
 - 1) Shall conform to ASTM C618 for Class N or F materials (Class C is not permitted).
 - b. Ground-granulated blast-furnace slag used as a partial substitution for ASTM C150 Portland cement shall meet the following requirements:
 - 1) Shall conform to ASTM C989.
7. Admixtures containing ASTM C845 expansive cements shall be compatible with the cement and produce no deleterious effects.
8. Silica fumes used as an admixture shall conform to ASTM C1240.
- E. Expansion Joint Fillers: Preformed strips, non-extruding and resilient bituminous type, of thickness indicated, conforming to ASTM D1751.
- F. Curing:
 1. Curing Paper: Shall conform to ASTM C171 and consist of two sheets of kraft paper cemented together with a bituminous material in which are embedded cords or strands of fiber running in both directions. The paper shall be light in color, shall be free of visible defects, with uniform appearance.
 2. Elevated slabs and slabs on grade may be cured at CONTRACTOR's option with curing and proactive water vapor emission and alkalinity control system. Products shall be approved by OWNER's Office of Environmental Health and Safety.
 - a. VaporSeal 309, by Floor Seal Technology, Inc., or equal.
 - 1) ASTM C156: 0.39 kg/m².
 - 2) ASTM C309: Exceeds requirements.
 - 3) ASTM C1315: Exceeds requirements.
 - 4) ACI 308R-01 Compliant.
 - b. Remedial Treatment: Water vapor emission and alkalinity control treatment, MES 100 by Floor Seal Technology, Inc. or equal.
 - 1) ASTM E96: <0.1 Perms.
 - 2) ASTM D1308: 14pH Resistant.

- 3) ASTM D7234: 500+psi 100% concrete failure.
 - 4) ASTM F2170: 100%RH resistant.
 - 5) VOC Content: <100 g/L, meets SCAQMD Rule #1113.
 - 6) ASTM F3010: Meets Requirements.
- c. Self-leveling Compounds: Ardex Engineered Cements, K15, Combimix; Leveler 720. Armstrong, S-194, or equal.
- G. Floor Hardener: Water soluble, inorganic, silicate-based curing, hardening, sealing and dustproofing compound. Aquaseal W20 by Monopole Inc., Kure-N-Harden by BASF, Chem Hard by L&M, Liqui-Hard by W. R. Meadows, or equal.
- H. Underlayment: Two component latex underlayment for filling low spots in concrete for both interior and exterior applications, from featheredge to a maximum of 3/8 inch in thickness. Underlayment shall be non-shrink and suitable for repairing exposed concrete surfaces and for underlayment of carpet, resilient, tile and quarry floor coverings. La-O- Tex by TexRite, Underlay C, RS by Mer-Krete Systems, Underlayment 962 by C-Cure, or equal.
- I. Vapor Barrier: Refer to Section 07 2600, Vapor Barriers.
- J. Stair Treads and Nosings: Two part stair tread and nosing with ribbed abrasive bars. Fabricated from 6063-T5 or 6063-T6 extruded aluminum, mill finish. Anti-slip abrasive filler consisting of aluminum oxide, silicon carbide, or a combination of both, in an epoxy-resin binder. Color shall extend uniformly throughout filler.
1. American Safety Tread: TP-311R.
 2. Balco Inc.: DST-330.
 3. Nystrom: STTB-P3.375E.
 4. Wooster Products Inc.: WP-RN3SG.
 5. Equal.
- K. Grout: ASTM C1107, non-shrink type, pre-mixed compound consisting of non- metallic aggregate, cement, water reducing and plasticizing additives, capable of developing a minimum compressive strength of 7,000 psi at 7 days; of consistency suitable for application and a 30 minute working time.

2.02 CONCRETE MIX

- A. Mix shall be signed and sealed by a Civil or Structural Engineer currently registered in the State of California.
- B. Strength of Concrete: Strengths and types of concretes shall be as indicated in the Drawings. Unless otherwise indicated or specified, concrete shall be provided with minimum 28-day strength of 3000 psi (f'c).
- C. Concrete mix shall meet the durability requirements of ACI 318, Chapter 4.
- D. Concrete proportioning shall be determined on the basis of field experience and/or trial

mixtures shall in accordance with ACI 318, Section 5.3. Proportions of materials shall provide workability and consistency to permit concrete to be placed readily into forms and around reinforcement under conditions of placement to be employed, without segregation or excessive bleeding.

- E. Ready-Mixed Concrete: Mix and deliver in accordance with requirements of ASTM C94.

PART 3 – EXECUTION

3.01 GENERAL

- A. Surfaces to receive concrete shall be free of debris, standing water, and any other deleterious substances before start of concrete placing.
- B. Time of Placing: Do not place concrete until reinforcement, conduits, outlet boxes, anchors, hangers, sleeves, bolts, and other embedded materials are securely fastened in place. Contact the Inspector at least 24 hours before placing concrete; do not place concrete until inspected by the Project Inspector.
- C. Pouring Record: A record shall be kept on the Project site of time and date of placing concrete in each portion of structure. Such record shall be maintained on the Project site until Substantial Completion and shall be available for examination by the ARCHITECT and DSA.

3.02 TOLERANCES

- A. Concrete construction tolerances shall be as specified in ACI 117 and as modified herein.
- B. Floor Flatness (FF) and Floor Levelness (FL) shall be as indicated below:

	Specified Overall Value		Minimum Local Value	
	FF	FL	FF	FL
Slabs on ground: mechanical and electrical rooms, parking structures and mortar bed set tile and quarry flooring.	20	15	15	10
Slab on ground: carpet.	25	20	17	15
Slab on ground: thinset tile and resilient flooring.	35	25	24	17
Suspended slabs: mechanical and electrical rooms, parking structures and mortar bed set tile and quarry flooring.	20	15	N/A	N/A
Suspended slabs: carpet.	25	20	N/A	N/A
Suspended slabs: thinset tile and resilient flooring.	35	20	N/A	N/A

- C. Refer to ACI 302.1R, Tables 8.1 and 8.2 Slab on Ground and Suspended Flatness/Levelness

Construction Guide, for recommended concrete placing and finishing methods.

- D. Floor Flatness and Floor Levelness shall be tested in accordance to ASTM E1155. Floor measurements shall be made within 48 hours after slab installation, and shall precede removal of shores and forms.

3.03 PREPARATION

A. Reglets and Rebates:

1. Form reglets and rebates in concrete to receive flashing, frames and other equipment as detailed and required. Coordinate dimensions and locations required with other related Work.
2. If concrete slabs on grade adjoin a wall or other perpendicular concrete surface, form a reglet in wall to receive and carry horizontal concrete Work. Reglet shall be full thickness of the slab and shall be 3/4 inch wide, unless otherwise indicated. Requirement does not apply to exterior walks, unless specifically indicated.

- B. Screeds: Install screeds accurately and maintain at required grade or slab elevations after steel reinforcement has been installed, but before starting to place concrete. Install screeds adjacent to walls and in parallel rows not to exceed 8 feet on centers.

3.04 INSTALLATION

A. Conveying and Placing:

1. Concrete shall be placed only under direct observation of the Project Inspector. Do not place concrete outside of regular working hours, unless the Inspector has been notified at least 48 hours in advance.
2. Concrete shall be conveyed from mixer to location of final placement by methods that will prevent separation or loss of materials.
3. Concrete shall be placed as nearly as practicable to its final position to avoid segregation due to re-handling or flowing. No concrete that has partially hydrated or has been contaminated by foreign materials shall be placed, nor shall re-tempered concrete or concrete which has been remixed after initial set be placed.
4. In placing concrete in columns, walls or thin sections, provide openings in forms, elephant trunks, tremies or other recognized devices, to prevent segregation and accumulation of partially hydrated concrete on forms or metal reinforcement above level of concrete being placed. Such devices shall be installed so that concrete will be dropped vertically. Unconfined vertical drop of concrete from end of such devices to final placement surface shall not exceed 6 feet.
5. Concrete shall be placed as a continuous operation until placing of panel or section is completed. Top surfaces of vertically formed lifts shall be level.
6. Concrete shall be thoroughly consolidated by suitable means during placement, and shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms.
7. Where conditions make consolidation difficult or where reinforcement is congested, batches of mortar containing same proportions of cement, sand, and water as

provided in the concrete, shall first be deposited in the forms to a depth of at least one inch.

B. Cold Weather:

1. Provide adequate equipment for heating concrete materials and protecting concrete during freezing or near-freezing weather. All ground with which concrete is to come in contact shall be free from frost. No frozen materials or materials containing ice shall be used.
2. The temperature of concrete at the time of placement shall not be below the minimum temperatures given in Table 3.1 of ACI 306.1.
3. Concrete shall be maintained at a temperature of at least 50° F. for not less than 72 hours after placing or until it has thoroughly hardened. Cover concrete and provide sufficient heat as required. When necessary, aggregates shall be heated before mixing. Special precautions shall be taken for protection of transit-mixed concrete.

C. Hot Weather:

1. Concrete to be placed during hot weather shall comply with the requirements of ACI 318, Section 5.13.
2. Maintain concrete temperatures indicated in Table 2.1.5 of ACI 305R to prevent the evaporation rate from exceeding 0.2 pound of water per square feet of exposed concrete per hour.
3. Cool concrete using methods indicated in ACI 305R Appendix B.
4. Place and cure concrete as specified in ACI 305R Chapter 4.

D. Compaction and Screeding:

1. Tamp freshly placed concrete with a heavy tamper until at least 3/8 inch of mortar is brought to surface. Concrete shall then be tamped with a light tamper and screeded with a heavy straightedge until depressions and irregularities are eliminated, and surface is true to finish grades or elevations. Remove excess water and debris.

E. Floating and Troweling:

1. When concrete has hydrated sufficiently, it shall be floated to a compact and smooth surface. After floating, wait until concrete has reached proper consistency before troweling. Top surfaces shall receive at least 2 troweling operations with steel hand trowel. Prior to and during final troweling, apply a fine mist of water frequently with an atomizing type fog sprayer. Omit troweling for slabs to receive a separate cement finish.
2. For interior finish slabs, final troweling shall provide a hard, impervious, and non-slip surfaces, free from defects and blemishes. Finished surface shall be within tolerances indicated in Article 3.02. Avoid burnishing. Do not add cement or sand to absorb excess moisture.
 - a. Floor of Gymnasium Locker Rooms: After floating, and while the surface is still plastic, provide a fine textured finish by drawing a fine fiber bristle broom uniformly over the surface in one direction only. Floors sloped for drainage

should be brushed in the direction of flow.

3. Exterior Paving and Cement Walks: Finish as specified above, except surface shall be given a non-slip broom finish to match Sample reviewed by the ARCHITECT.
4. Vertical concrete surfaces shall be finished smooth and free from marks or other surface defects.

3.05 CURING

- A. Length of time, temperature and moisture conditions for curing concrete shall be in accordance with ACI 318, Section 5.11.
- B. Forms containing concrete, top of concrete between forms, and exposed concrete surfaces after removal of forms shall be maintained in a thoroughly wet condition for at least 7 consecutive days after placing.
- C. If weather is hot or surface has dried out, spray surface of concrete slabs and paving with fine mist of water, starting not later than 2 hours after final troweling and continuing until sunset. Surface of finish shall be kept continuously wet until curing medium has been installed.
- D. Immediately after finishing, monolithic floor slabs shall be covered with curing paper. Paper shall be lapped 4 inches at joints and sealed with waterproof sealer. Edges shall be cemented to finish. Repair or replace paper damaged during construction operations.
- E. When curing slabs with proactive water vapor emission and alkalinity control system:
 1. Coordinate and schedule application of curing compound with concrete pour schedule, while conforming to manufacturer's application instructions.
 2. When the surface of the concrete has hardened sufficiently to sustain foot traffic pre-cure slabs with liquefied product application following manufacturer's written instructions. Application shall be by trained applicators.
 3. Monitor Environmental Conditions: Set up weather station 20 to 30 inches above freshly placed concrete. Record temperature, humidity and wind velocity measurements at 15 minute maximum intervals.
 4. Calculate Evaporation Rate: Use recorded weather information in combination with nomograph per ACI 308R, Figure 4.1, Guide to Curing Concrete, to evaluate relevant evaporation rate.
 5. When the bleed water rate of the concrete is approximately equal to the surface water evaporation rate, spray curing compound material throughout surface of slabs and decks, following manufacturer's written instructions. Application shall be by trained applicators.
 6. Perform the following tests at least 28 days after placement of concrete and prior to floor covering installation. Submit to OAR test results indicating locations that do not comply with scheduled flooring installation requirements.
 - a. Calcium chloride testing per ASTM F1869.
 - b. Relative humidity testing per ASTM F2170.
 - c. Alkalinity testing per ASTM F710.

- d. Perform concrete bond layer humidity meter testing to determine substrate surface acceptability.

3.06 FILLING, LEVELING AND PATCHING

- A. Concrete slabs exhibiting high or low spots and indicated to receive resilient floor covering or soft floor covering, shall have surfaces repaired. High spots shall be honed, or ground with power-driven machines to required tolerances. Low spots shall be filled with latex underlayment, installed in strict accordance with manufacturer's written recommendations.
- B. Holes resulting from form ties or sleeve nuts shall be solidly packed, through exterior walls, by pressure grouting with cement grout, as specified. Grouted holes on exposed surfaces shall be screeded flush and finished to match adjoining surfaces.
- C. Cement Base: Cement base shall be of the height, thickness, and shape detailed. Base shall be reinforced with one inch mesh, 18 gage, zinc-coated wire fabric. Base finish mixture shall be one part Portland cement, 2 parts of fine aggregate and one part pea gravel. Colored cement base shall include a chemically inert mineral oxide pigment in the mix.

3.07 FINISHING

- A. Soda and Acid Wash: Concrete surfaces to receive plaster, paint or other finish, and which have been formed by oil coated forms, shall be scrubbed with a solution of 1-1/2 pounds of caustic soda to one gallon of water. Surfaces where smooth wood or waste molds have been furnished shall be scrubbed with a solution of 20 percent muriatic acid. Wash with clean water after scrubbing.
- B. Sacking: Exposed concrete curbs, walls, and other surfaces shall be sacked by an application of Portland cement grout, floated, and rubbed. Sacking shall not be performed until patching and filling of holes has been completed. Entire sacking operation for any continuous area shall be started and completed within the same day.
 - 1. Mix one part Portland cement and 1-1/2 parts fine sand with sufficient water to produce a grout having consistency of thick paint. Wet surface of concrete sufficiently to prevent absorption of water from grout. Apply grout uniformly with a brush or spray gun, then immediately float surface with a cork or other suitable float, scouring wall vigorously.
 - 2. While grout is still plastic, finish surface with a sponge-rubber float, removing excess grout. Allow surface to dry thoroughly, then rub vigorously with dry burlap to completely remove dried grout. No visible film or grout shall remain after rubbing with burlap.
- C. Abrasive: Concrete stair treads, landings, ramps and steps on interior and exterior of buildings, and interior exposed concrete floors in shop buildings shall receive an abrasive finish.
- D. Floor Hardener: Exposed interior concrete floors throughout shall be treated with floor hardener.
 - 1. Protect adjacent surfaces. Clean surfaces to receive treatment in accordance with manufacturer's instructions, ensuring that all stains, oil, grease, form release agents, laitance, dust and dirt are removed prior to application.
 - 2. Apply hardener in accordance with manufacturer's instructions as soon as concrete is firm enough to work on after final troweling.

- E. Cement Grout and Dry-Pack Concrete: Cement grout shall be mixed at the Project site and shall be composed of one volume of Portland cement and 2-1/2 volumes of fine aggregate. Materials shall be mixed dry with sufficient water added to make mixture flow under its own weight. When grout is used as a dry pack concrete, add sufficient water to provide a stiff mixture, which can be molded into asphere.
- F. Broom Finish: Exterior stair treads and landings shall be provided with a non-slip broom finish in addition to abrasive finish specified.
- G. Abrasive Stair Nosing: Nosing shall be installed according to manufacturers written recommendations.

3.08 EXPANSION AND CONSTRUCTION JOINTS

- A. Construction Joints: Details and proposed location of construction joints shall be as indicated on the Drawings, located to least impair strength of structure, in accordance with the following:
 - 1. Thoroughly clean contact surface by sand blasting entire surface not earlier than 5 days after initial placement.
 - 2. A mix containing same proportion of sand and cement provided in concrete plus a maximum of 50 percent of coarse aggregate shall be placed to a depth of at least one inch on horizontal joints. Vertical joints shall be wetted and coated with a neat cement grout immediately before placing of new concrete.
 - 3. Should contact surface become coated with earth, sawdust, or deleterious material of any kind after being cleaned, entire surface shall be re-cleaned before applying mix.
- B. Expansion Joints: Provide expansion joints where indicated in walks and exterior slabs. Space approximately 20 feet apart, unless otherwise indicated. Joints shall extend entirely through slab with joint filler in one piece for width of walk or slab. Joint filler shall be 3/8 inch thick, unless otherwise indicated.
- C. Tooled Joints: Slabs, walks and paving shall be marked into areas as indicated with markings made with a V-grooving tool. Marks shall be round-edged, free from burrs or obstructions, with clean cut angles and shall be straight and true. Walks, if not indicated, shall be marked off into rectangles of not more than 12 square feet and shall have a center marking where more than 5 feet wide.

3.09 TESTING

- A. Molded Cylinder Tests:
 - 1. Inspector or testing lab personnel will prepare cylinders and perform slump tests. Samples for concrete strength shall be taken in accordance to ASTM C172. Each cylinder shall be dated, given a number, point in structure from which sample was obtained, mix design number, mix design strength and result of accompanying slump test noted.

2. Separate tests of molded concrete cylinders obtained at same place and time shall be made at age of three days, seven days, and 28 days. A strength test shall be the average of the compressive strength of two cylinders, obtained from the same sample of concrete and tested at 28 days or at test age designated for determination of f'_c .
 3. Test cylinders shall be prepared at the Project site and stored in testing laboratory in accordance with ASTM C31, and tested in accordance with ASTM C39.
- B. Core Test: At request of the ARCHITECT, cores of hardened concrete shall be cut from portions of hydrated structures for testing, in accordance with CBC and ASTM C42.
1. Provide 4 inch diameter cores at representative places throughout the structure as designated by the ARCHITECT.
 2. In general, provide sufficient cores to represent concrete placed with at least one core for each 4,000 square feet of building area, and at least 3 cores total for each Project.
 3. Where cores have been removed, fill voids with drypack, and patch the finish to match the adjacent existing surfaces.
- C. Concrete Consistency: Measure consistency according to ASTM C143. Test twice each day or partial day's run of the mixer.
- D. Adjustment of Mix: If the strength of any grade of concrete for any portion of Work, as indicated by molded test cylinders, falls below minimum 28 days compressive strength specified or indicate, adjust mix design for remaining portion of construction so that resulting concrete meets minimum strength requirements.
- E. Air Content Testing: Measure in accordance to ASTM C173 or ASTM C231, for each composite sample taken in accordance to ASTM C172.
- F. Defective Concrete:
1. Should strength of any grade of concrete, for any portion of Work indicated by tests of molded cylinders and core tests, fall below minimum 28 days strength specified or indicated, concrete will be deemed defective Work and shall be replaced or adequately strengthened in a manner acceptable to the ARCHITECT and DSA.
 2. Concrete Work that is not formed as indicated, is not true within 1/250 of span, not true to intended alignment, not plumb or level where so intended, not true to intended grades and levels, contains sawdust shavings, wood or embedded debris, or does not fully conform to Contract provisions, shall be deemed to be defective Work and shall be removed and replaced.
- G. Concrete for Equipment Pads, Mechanical and Electrical Work: Unless otherwise indicated, strength shall have a minimum $f'_c = 3,000$ psi. Exposed concrete shall be provided with a hand trowel finish with radius corners and edges. Form and place concrete where necessary as described in Section 03 1000 Concrete Forming and Accessories, and reinforced as described in Section 03 2000 Concrete Reinforcing. Calcium chloride shall not be furnished in any concrete mix provided for the installation of underground electrical conduits. For concrete encasement of more than one conduit, furnish 3/4 inch maximum aggregate.

3.10 CLEAN UP

- A. Remove rubbish, debris and waste materials and legally dispose of off the Project site.

3.11 PROTECTION

- A. Protect the Work of this section until Substantial Completion.

END OF SECTION

SECTION 04 22 00
CONCRETE UNIT MASONRY (CMU)

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Furnish materials and perform labor required to execute this work as indicated on the drawings, as specified and as necessary to complete the Contract, including, but not limited to, these major items:
 - a. Concrete masonry units.
 - b. Precast concrete caps.
 - c. Vertical and horizontal reinforcing and dowels projecting into subsequently placed concrete.
 - d. Setting of flashing and other work to be embedded in masonry.

B. Work installed but furnished in other Sections:

1. Sleeves, inserts and similar items furnished by other trades for installation in masonry.

C. Related sections:

1. Section 03 30 00 - Cast-In-Place Concrete: Concrete, including dowels installed in concrete, placed prior to installation of masonry work, for anchorage of masonry.
2. Section 05 55 00 Miscellaneous Metals.
3. Section 07 19 00 Water Repellent Coating.
4. Section 07 60 00 Flashing and Sheet Metal.
5. Section 07 92 00 Joint Sealants.

1.2 DEFINITIONS AND REFERENCES

- A. ASTM A615 - Deformed and Plain Carbon Steel Bars for Concrete Reinforcement.
- B. ASTM C33 - Concrete Aggregates.
- C. ASTM C90 - Test Method Pullout Strength for Hardened Concrete.
- D. ASTM C114 - Test Methods for Chemical Analysis of Hydraulic Cement.
- E. ASTM C144 - Aggregate for Masonry Mortar.
- F. ASTM C150 - Portland Cement.
- G. ASTM C207 - Hydrated Lime for Masonry Purposes.
- H. ASTM C404 - Aggregates for Masonry Grout.

1.3 SUBMITTALS

- A. Procedures: In accordance with requirements of Section 01300.
- B. Product data: Manufacturer's information for all specified items.
- C. Samples: Samples of all blocks used in the work.
- D. Sample panel: Erect a 3' high x 4' long sample panel of concrete block masonry. After review and acceptance by Architect, ensure that all masonry work matches accepted panel.
- E. Certificates: Prior to delivery, submit certificates attesting compliance of CMU with applicable specifications for grades, types or classes.

1.4 QUALITY ASSURANCE

- A. Regulatory requirements:
 - 1. Materials and work: Conform to California Building Code latest edition, Chapter 21, Title 24, Part 2, California Code of Regulations latest edition. In case of conflict between these specifications and Building Codes, the more stringent shall govern.
 - 2. Provide for testing and quality control per CBC 2016 Sections 2105A.1 and 2105A.2.1.
 - 3. NOTE! All structural masonry requires continuous inspection by an inspector approved by enforcement agency.
- B. Verify that masonry units have been cured for 28 days before delivery to project site.

1.5 PRODUCT HANDLING

- A. Procedures: In accordance with Section 01 60 20.
- B. Deliver reinforcement to site bundled, tagged and marked; handle to prevent damage to material. Use metal tags indicating size, length and other markings shown on placement drawings. Maintain tags after bundles are broken.
- C. Protection: Safeguard all materials against injury in transit, delivery, storage, sorting, installation, cleaning, and until final acceptance of completed work.
- D. Store cement and lime in rain proof sheds with elevated floors.
- E. Store sand on tightly floored space, protected against mixing with ground or other materials.

PART 2 - PRODUCTS

2.1 MANUFACTURERS AND PRODUCT

- A. Manufacturer: Orco Block Co., Inc.
- B. Specified manufacturer establishes a standard of quality, function and design for this project. Other acceptable manufacturers having equivalent products may be used only with Architect's approval.
 - 1. Alternate manufacturers: Angelus Block Company, or equal.

2.2 MATERIALS

- A. Concrete block units: ASTM C90, Grade N-1, hollow, medium weight, load bearing units. Aggregates - ASTM C33. Sizes and types as shown on drawings. Provide open end units, special sizes and special shapes shown on drawings.
 - 1. Masonry units: Cured for not less than 28 days when placed in structure and have a maximum linear shrinkage of 0.06% from saturated to over-dry condition, when tested according to methods published in Quality Control Standards of Concrete Masonry Association.
 - 2. Colors: To be selected by Architect from manufacturer's standard range of colors and textures.
- B. Portland cement: ASTM C150, Type II; standard brand, containing not more than 0.6% total alkali, where calculated as sodium oxide in accordance with ASTM C114. Use only one brand.
 - 1. Plastic cement is not acceptable.
- C. Sand: ASTM C144. For grout, not less than 3% shall pass the No. 100 sieve.
- D. Pea gravel: ASTM C404. Clean, hard, containing not more than 5% by weight of flat, thin, elongated, friable, or laminated pieces; uniformly graded with not over 5% passing a No. 8 sieve to 100% passing a 3/8" sieve.
- E. Lime putty: Make from hydrated lime conforming to ASTM C207, Type S, pulverized to such fineness that 100% will pass a 50 mesh sieve. Mix lime in water, run through screen into box, and age 48 hours.
- F. Reinforcing steel: ASTM A615, Grade 60 except rebar sizes. No. 3 and No. 4 may be grade 40.
- G. Water: Clean; from a source intended for domestic consumption.
- H. Admixtures: Red Label for mortar, and Grout Aid Type II for grout, both by Sika Corporation. Use is at Contractor's option.
- I. Concrete cap: Size as shown on drawings. Color to match adjacent CMU.

2.3 MORTAR AND GROUT

- A. Mixes: Design by a testing laboratory, select and pay for by Contractor.
 - 1. Plastic cement is not acceptable.
- B. Compressive strengths at 28 days shall be as shown on the structural drawings. If not shown, use the following as a minimum:
 - 1. Typical walls.
 - a. Block Units 2600 psi
 - b. Mortar (Type M or S) 2400 psi
 - c. Grout 2700 psi

- C. Mixing: Mix water, and cement for two minutes, then add lime and admixture, continue mixing in a mechanically operated batch mixer; a continuous mortar mixer will not be permitted. Mix to maintain a slump of from 2 1/2" to 3".
- D. Discard mortar and grout not used within 30 minutes after leaving mixer. Retempering of mixture shall not be allowed.

2.4 QUALITY CONTROL OF MASONRY CONSTRUCTION

- A. The compressive strength of concrete masonry shall be determined by the **PRISM TEST METHOD** prior to the start of construction and during construction per CBC 2016, Section 2105A.2.2.2.
- B. Mortar and grout sample shall be taken for test to establish whether the masonry components meet the specified component strengths per CBC 2016, section 2105A.3.
- C. Masonry core test shall be performed to determine the quality of the masonry constructed per CBC 2016, section 2105A.4.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine adjacent construction and supports. Verify that surfaces are within allowable tolerances, plumb, level, clean, and will provide solid anchoring surfaces.
- B. Correct conditions detrimental to proper or timely completion of this work before proceeding with installation.

3.2 SCAFFOLD AND PROTECTION

- A. Provide and maintain scaffolding, staging and forms of protection necessary for execution of work, as required, substantially constructed, moved and dismantled as necessary to properly follow sequence of operations.

3.3 SHORES AND CENTERING

- A. Provide shores and centering for work, constructed true to required shape, size and form, well braced and made rigid, and capable of supporting and sustaining loads to which subjected. Leave shores and centering in place until the masonry is sufficiently set to safely carry its own weight and added loads of construction.

3.4 PLACING REINFORCEMENT

- A. Reinforcement steel, except dowels in other material. Accurately set and place strictly as shown or noted. In spaces containing reinforcement, except small rods or mesh one-quarter inch or less in diameter, the clear distances between masonry and the reinforcement shall be at least 1/4".
 - 1. Vertical bars: Continuous from bottom of cell to top of wall, centered in cells, except where otherwise shown on drawings. Where necessary, hold vertical steel firmly in place by frames or other suitable devices as reviewed and accepted.
 - 2. Horizontal bars: Wire temporarily above exact position and tag to correct locations shown on drawings. Use calibrated vertical markers to indicate correct location. Provide horizontal bars where shown on drawings, held in contact to vertical bars or dowels.

3.5 PREPARATION

- A. Previously placed concrete or masonry: Clean of encrustation, laitance, oil, and coatings which would reduce bond, including sandblasting as required. Clean thoroughly and roughen contact surfaces of all foundations and floors that are to receive masonry work, before start of laying masonry units. Protect roughened surface during construction to assure a good bond between grout fill and concrete surface. Wash surfaces thoroughly with water under pressure; leave surfaces damp where masonry units connect with earlier placed work.
- B. Masonry units: Thoroughly clean of dust, grease, oil or other matter which would reduce bond.
- C. Wetting: Protect concrete masonry unit against wetting before installation.
- D. Reinforcement: Clean of mill scale; lose rust, oil and coatings which would reduce bond.
- E. Obtain approval of methods of placement and fastening of reinforcement prior to start of work.

3.6 BONDING

- A. Masonry bonding to concrete: Clean top surface of concrete. Remove laitance and expose aggregates before placing masonry units.
- B. Lay up wall in straight uniform courses with regular running bond or as shown on drawings.

3.7 GROUTING - LOW LIFT

- A. Low-lift grout if used shall conform to CBC 2016, Section 2104A.1.3.1.1.1.1.
- B. Prior to grouting, clean grout space so that all spaces to be filled with grout do not contain mortar projections greater than 1/2", mortar drippings or other foreign material.
- C. Maximum lift: 4 feet.
- D. Grouting of the wall: Complete in one day, with no interruptions greater than one hour.
- E. Fill all cells and spaces with grout.
- F. Consolidate grout by mechanical vibration or other means which are approved by Division of State Architect, during placing, before loss of plasticity, in a manner to fill grout space without contacting reinforcing. Mechanical vibration requires use of high frequency vibration equipment producing 10,000 cycles per second, minimum, and sized as required.

3.8 GROUTING - HIGH LIFT

- A. High-lift grout shall conform to CBC 2016, Section 2104A.1.3.1.1.1.2.
- B. Additional requirements for high-lift grouted wall construction shall be per DSA IR 21-2.

3.9 BLOCK LAYING (GENERAL)

- A. Notes: General Notes on structural drawings are part of this Section.
- B. Preserve unobstructed vertical continuity of cells to be filled. Fully bed webs and cross-walls forming such cells in mortar to prevent leakage of grout. Strike joints around such cells smooth.
- C. Fractional parts of masonry units are prohibited where whole units can be used. Chinking of interstices with fragments will not be allowed. Provide special units as necessary to form opening and lintels.

- D. Install lintel units at lintels, corner units at corners.
- E. No miters are permitted. No exposed cells are permitted.
- F. No part of any masonry wall may be carried more than 3 feet higher than adjoining portions.
- G. Where it is absolutely necessary, for construction purposes, to stop off longitudinal runs of masonry, stop off only racking back one-half unit length in each course. Tothing will not be permitted.
- H. Execute masonry work according to best standards of practice for trade. Erect masonry plumb, square, straight and true to indicated lines, position and dimensions and in level courses.
- I. Make provision for special units as required to form bond beams, openings and offsets and maintain a proper bond throughout entire length of wall.
- J. Masonry units: Sound, dry, clean and free from cracks when placed in the structure.
- K. Do not wet masonry units except in very dry weather, moisten contact surfaces of units immediately before laying.
- L. Cut units accurately to fit openings for other work. Cut and patch holes neatly and accurately.
- M. If it is necessary to move a unit after it has been once set in place, remove unit from wall, clean and set in fresh mortar.
- N. Where necessary to cut concrete masonry units in order to conform to adjacent construction or to indicate joint pattern, saw masonry units with diamond or other abrasive saw to produce a straight, sharp edge without spalling or other defects. Cut units as required to maintain uniform joint widths throughout.
- O. When possibility of rain occurs, cover tops of all walls exposed to weather, and all concrete masonry units with sheets of polyethylene, or other reviewed and accepted effective forms of protection, to prevent absorption of water. Store masonry units above ground if there is a possibility of surface flooding exists.

3.10 JOINTS

- A. Exterior joints: Point mortar joints flush, using a pointing trowel, and then tool to a slight concave profile, making solid, smooth, watertight joints.
- B. Interior joints: Strike flush and sack as work progresses.
- C. Unless otherwise shown, make joints 3/8" thick with full mortar coverage on face shells and on webs surrounding cells to be filled.
- D. Set lintels, capping units and bearing plates in a full bed of mortar.

3.11 BOLTS, ANCHORS AND REGLETS

- A. Set bolts, anchors, reglets, and inserts necessary for attachment of subsequent work, and items furnished under other sections. Provide a minimum of 1" grout around all anchor bolts.

3.12 POINTING AND CLEANING

- A. Leave exposed surfaces clean and free of surplus mortar or foreign material. Exercise care to keep grout and mortar droppings off finished surfaces.
 - 1. Defective joints: Point holes or defective mortar joints, in exposed masonry, and where necessary, cut out defective joints and repoint.
 - 2. Staining and excess mortar: Protect exposed masonry against staining. Where grout or mortar does contact faces of masonry, remove it immediately. Where accidental spillage occurs, wash and clean surfaces immediately.

3.13 FIELD QUALITY CONTROL

- A. Contact testing laboratory to test mortar and grout to extent required by governing code. Mortar and Grout testing per CBC 2016, Section 2105A.3 and Core testing per CBC 2016, Section 2105A.4.
- B. Whenever there is any evidence that materials to be used in masonry construction do not conform to the Contract Documents, test materials for compliance before being used in project.
- C. District will pay for tests if they prove compliance with Contract Documents; otherwise costs of tests shall be paid by Contractor.
- D. Continuous inspection: As required by structural drawings.

END OF SECTION

**SECTION 05 12 00
STRUCTURAL STEEL FRAMING**

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Structural steel.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 01 4523 - Testing and Inspection.
3. Section 03 3000 - Cast-In-Place Concrete.
4. Section 04 2200 - Concrete Unit Masonry.
5. Section 05 3000 - Metal Decking.
6. Section 05 5000 - Metal Fabrications.
7. Section 09 9000 - Paints and Coatings.

1.02 REFERENCES

A. CBC Chapter 22A.

B. American Institute of Steel Construction (AISC):

1. AISC – Steel Construction Manual:
 - a. AISC 360 Specifications for Structural Steel Buildings.
 - b. AISC Code of Standard Practice for Steel Buildings and Bridges.
 - c. RCSC Specification for Structural Joints Using ASTM A325 or A490 Bolts.
2. AISC 341 - Seismic Provisions for Structural Steel Buildings, including Supplements.
3. AISC 358 - Prequalified Connections for Special and Intermediate Steel Moment Frames for Seismic Applications.

C. American Society for Testing and Materials (ASTM):

1. ASTM A36 – Standard Specification for Carbon Structural Steel.
2. ASTM A53 – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
3. ASTM A108 – Standard Specification for Steel Bar, Carbon and Alloy, Cold- Finished.
4. ASTM A123 – Standard Specification for Zinc (Hot-Dipped Galvanized) Coatings on Iron and Steel Products.

5. ASTM A153 – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
6. ASTM A307 – Standard Specification for Carbon Steel Bolts and Studs, 60000 PSI Tensile Strength.
7. ASTM A325 – Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 Ksi Minimum Tensile Strength.
8. ASTM A435 – Standard Specification for Straight-Beam Ultrasonic Examination of Steel Plates.
9. ASTM A490 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
10. ASTM A500 – Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
11. ASTM A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
12. ASTM A572 – Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
13. ASTM A653 – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
14. ASTM A673 - Standard Specification for Sampling Procedure for Impact Testing of Structural Steel.
15. ASTM A780 – Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
16. ASTM A992 – Standard Specification for Structural Steel Shapes.
17. ASTM C1107 – Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-Shrink).
18. ASTM E23 - Standard Test Methods for Notched Bar Impact Testing of Metallic Materials.
19. ASTM E112 - Standard Test Methods for Determining Average Grain Size.
20. ASTM F436 – Standard Specification for Hardened Steel Washers.
21. ASTM F959 - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners.
22. ASTM F1554 – Standard Specification for Anchor Bolts, Steel, 36, 55 and 105-Ksi Yield Strength.
23. ASTM F1852 – Standard Specification for “Twist Off” Type Tension Control Structural Bolt/Nut/Washer Assemblies, Steel, Heat Treated, 120/105 ksi Minimum Tension Strength.

- D. American Welding Society (AWS):
 - 1. AWS D1.1 – Structural Welding Code - Steel.
 - 2. AWS D1.8 – Structural Welding Code – Seismic Supplement.
 - 3. AWS A2.4 – Standard Symbols for Welding, Brazing, and Nondestructive Examination.
 - 4. AWS B2.1 – Specifications for Welding Procedures and Performance Qualification.
- E. SSPC – Steel Structures Painting Council:
 - 1. SP-2 - Hand Tool Cleaning.
 - 2. PA-1 - Paint Application Specification No. 1.

1.03 REGULATORY REQUIREMENTS

- A. Structural steel shall conform to CBC requirements, except that steel manufactured by acid Bessemer process is not permitted for structural purposes.
- B. Sheet and strip steel other than those listed in CBC, if provided for structural purpose, shall comply with DSA requirements.

1.04 SUBMITTALS

- A. Shop Drawings: Submit Shop Drawings, including complete details and schedules for fabrication and shop assembly of members, and details, schedules, procedures and diagrams showing the sequence of erection. Fully detail minor connections and fastenings not shown or specified in the Contract Documents to meet required conditions using similar detailing as shown in the Contract Documents. Include a fully detailed, well controlled sequence and technique plan for shop and field welding that minimizes locked in stresses and distortion; submit sequence and technique plan for review by the ARCHITECT.
 - 1. Include details of cuts, connections, camber, and holes in accordance with Figure 4.5 of AWS D1.1 or AISC Chapter J, weld position plan and other pertinent data. Indicate welds by standard AWS symbols, and show size, length and type of each weld.
 - 2. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed for Work specified in other sections.
 - 3. Erection and Bracing Plan and Erection Procedure: Submit an erection and framing plan, including columns, beams, and girders, signed and sealed by a Structural or Civil Engineer registered in the State of California in accordance with Title 8 California Code of Regulations, Section 1710, Structural Steel Erection. Maintain a copy at the Project site as required by the California Division of Industrial Safety.
 - 4. Indicate steel items to be galvanized.
 - 5. Include identification and details of Architecturally Exposed Structural Steel (AESS) members, if applicable.
- B. Product Data: Submit copies of fabricator's specifications and installation instructions for the following products. Include laboratory test reports and other data required demonstrating compliance with these Specifications:

1. Structural steel, each type, including certified copies of mill reports covering chemical and physical properties.
 2. Welding electrodes.
 3. Welding gas.
 4. Unfinished bolts and nuts.
 5. Structural steel primer paint.
 6. High-strength bolts, including nuts and washers.
- C. Manufacturer's Mill Certificate: Submit, certifying that products meet or exceed specified requirements.
- D. Mill Test Reports: Submit manufacturer's certificates, indicating structural yield and tensile strength, destructive and non-destructive test analysis.
- E. Welding Procedure Specifications (WPS): Submit weld procedures for all welding on project to OWNER's testing laboratory for approval. After approval by testing laboratory, submit to ARCHITECT for Record. Weld procedures shall be qualified as described in AWS D1.5, AISC 341 and AISC 358, as applicable. Weld procedures shall indicate joints details and tolerances, preheat and interpass temperature, post-heat treatment, single or multiple stringer passes, peening of stringer passes for groove welds except for the first and the last pass, electrode type and size, welding current, polarity and amperes and root treatment. The welding variables for each stringer pass shall be recorded and averaged; from these averages the weld heat input shall be calculated. Submit the manufacturer's product data sheet for all welding material used.
- F. Welder's Certificates: Field welders shall be Project certified in accordance with AWS D1.1. Shop welders shall be Project certified for FCAW in accordance with AWS D1.1.
- G. Test Reports: Submit reports of tests conducted on shop and field welded and bolted connections. Include data on type of test conducted and test results.

1.05 QUALITY ASSURANCE

- A. Comply with the following as a minimum requirement, except as otherwise indicated:
1. American Institute of Steel Construction (AISC) "Code of Standard Practice for Steel Buildings and Bridges, modified as follows:
 - a. Replace "Structural Design Drawings" with "Contract Documents" throughout the document.
 - b. Paragraph 3.2 is hereby modified in it's entirety as follows: "Contract Documents including but not limited to architectural, mechanical, plumbing, electrical, civil and kitchen design drawings and specifications shall be used as supplement to the structural plans to define configurations and construction information."
 - c. Delete Paragraph 3.3.
 - d. In Paragraph 4.4, delete the following sentence: "These drawings shall be returned to the Fabricator within 14 calendar days."

- e. Delete Paragraph 4.4.1.(a) in its entirety.
 - f. Paragraph 4.4.2 is hereby modified in its entirety as follows: "No review action, implicit or explicit, shall be interpreted to authorize changes in the Contract Documents."
 - 2. Perform welding in accordance with AWS Standards, AWS D1.1, and California Building Code Section 2204A.1 and approved Weld Procedure Specifications (WPS).
 - B. Shop fabrication shall be inspected in accordance with CBC.
- 1.06 DELIVERY, STORAGE AND HANDLING
- A. Store structural steel above grade on platforms, skids or other supports.
 - B. Protect steel from corrosion.
 - C. Store welding electrodes in accordance with AWS D 12.1.
 - D. Store other materials in a weather-tight and dry place until installed into the Work.

PART 2 – PRODUCTS

2.01 GENERAL

- A. Stock Materials: Provide exact materials, sections, shapes, thickness, sizes, weights, and details of construction indicated on Drawings. Changes because of material stock or shop practices will be considered if net area of shape or section is not reduced thereby, if material and structural properties are at least equivalent, and if overall dimensions are not exceeded.
- B. Shapes, bars, plates, tubes and pipes shall be made of materials with at least 16 percent recycled content if produced from Basic Oxygen Furnace (BOF) or at least 67 percent recycled content if produced from Electric Arc Furnace (EAF).

2.02 MATERIALS

- A. Structural Steel: Wide flange shapes shall conform to ASTM A992 grade 50. Other steel shall conform to ASTM A36.
- B. Unfinished Threaded Fasteners: ASTM A307, Grade A, regular low carbon bolts and nuts.
- C. High-Strength Threaded Fasteners: ASTM A325, ASTM A490 ASTM F959 or ASTM F1852 quenched and tempered, steel bolts, nuts and washers.
- D. Primers: Lead-free metal primer:
 - 1. SSPC-Paint 20, Zinc-Rich Primer.
 - 2. SSPC-Paint 23, Latex Primer.
 - 1. SSPC-Paint 25 Zinc Oxide Primer.
- B. Steel Pipe: ASTM A53, Type E or S, Grade B.

- C. Structural Tubing:
 - 1. Hot-formed, ASTM A501.
 - 2. Cold-formed, ASTM A500, Grade B.
- D. Galvanizing: ASTM A123 (G90).
- E. Welding Electrodes: Provide electrodes recommended by manufacturer for seismic connections. Comply with AISC 341.
- F. Grout: ASTM C1107, non-shrink type, pre-mixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing additives, capable of developing a minimum compressive strength of 7,000 psi at seven days; of consistency suitable for application and a 30 minute working time.

2.02 FABRICATION

- A. Fabricate in accordance to AISC Code of Standard Practice for Steel Buildings and Bridges and AISC 360.
- B. Cleaning and Straightening Materials: Materials being fabricated shall be thoroughly cleaned of scale and rust, and straightened before fabrication. Cleaning and straightening methods shall not damage material. After punching or fabrication of component parts of a member, twists or bends shall be removed before parts are assembled.
- C. Cutting, Punching, Drilling and Tapping: Unless otherwise indicated or specified, structural steel fabricator shall perform the cutting, punching, drilling and tapping of Work so that Work of other trades will properly connect to steel Work.
- D. Milling: Compression joints depending on contact bearing shall be furnished with bearing surfaces prepared to a common plane by milling.
- E. Use of Burning Torch: Oxygen cutting of members shall be performed by machine. Gouges greater than 3/16 inch that remain from cutting shall be removed by grinding. Reentrant corners shall be shaped notch free to a radius of at least 1/2 inch. Gas cutting of holes for bolts or rivets is not permitted.
- F. Curve steel members to radius specified on plans.
- G. Galvanizing: After fabrication, items indicated or specified to be galvanized shall be galvanized in largest practical sizes. Fabrication includes operations of shearing, punching, bending, forming, assembling or welding. Galvanized items shall be free from projections, barbs, or icicles resulting from the galvanizing process.
- H. Welding:
 - 1. Type of steel furnished in welded structures shall provide chemical properties suitable for welding as determined by chemical analysis. Welds shall conform to the verification and inspection requirements of CBC Chapter 17A. Conform to AWS D1.1, and CBC Chapter 22A.
 - 2. Materials and workmanship shall conform to the requirements specified herein and to CBC requirements, modified as follows:

- a. No welded splices shall be permitted except those indicated on Drawings unless specifically reviewed by the ARCHITECT.
 - b. Drawings will designate joints in which it is important that welding sequence and technique be controlled to minimize shrinkage stresses and distortion.
- 3. Welding shall be performed in accordance with requirements of the AWS Structural Welding Code.
- I. Shop Finish:
 - 1. Notify the Project Inspector when Work is ready to receive shop prime coat. Work shall be inspected by the Project Inspector before installation of primer.
 - 2. Structural steel and fittings shall receive a coat of primer, except:
 - a. Surfaces that will be galvanized.
 - b. Surfaces that will be fireproofed.
 - c. Surfaces that will be field welded.
 - d. Surfaces in contact with concrete or grout.
 - e. Surfaces high strength bolted.
 - 3. The primer specified shall be spray applied, filling joints and corners and covering surfaces with a smooth unbroken film. The minimum dry film thickness of the primer shall be 2.0 mils.
- J. Comply with fabrication tolerance limits of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for structural steel.

2.03 SHOP AND FIELD QUALITY CONTROL

- A. A special inspector, approved by DSA to inspect the Work of this section, shall inspect high-strength bolted connections. OWNER will provide a DSA approved independent testing laboratory to perform tests and prepare test reports in accordance with CBC 1704A. The Project Inspector shall be responsible for monitoring the work of the special inspector and testing laboratories to ensure that the testing program is satisfactorily completed.
- B. An AWS CWI certified special inspector, approved by DSA to inspect the Work of this section, shall inspect welded connections in accordance with CBC 1705A.2.5. The OWNER will provide a DSA approved independent testing laboratory to perform tests and prepare test reports. The Project Inspector shall be responsible for monitoring the work of the special inspector and testing laboratories to ensure that the testing program is satisfactorily completed.
- C. The independent testing laboratory shall conduct and interpret test and state in each report whether test specimens comply with requirements, and specifically state any deviations there from.
- D. Provide access to all places where structural steel Work is being fabricated or produced so required inspection and testing can be performed.

- E. The independent testing laboratory may inspect or test structural steel at plant before shipment; however, ARCHITECT reserves the right at any time before Contract Completion to deem materials not in compliance with the specified requirements as defective Work.
- F. Correct defects in structural Work when inspections and laboratory test reports indicate noncompliance with specified requirements. Perform additional tests as may be required to reconfirm noncompliance of original Work, and as may be required to show demonstrate compliance of corrected Work.
- G. Inspection of Structural Tube Steel/Hollow Structural Sections (HSS): Structural tube steel members (round, square, rectangular), disregarding steel origin, will be inspected during shop fabrication per DSA Bulletin 07-03. Inspector will perform a visual examination of the seam weld area for visible discontinuities. When defects are suspected, non-destructive testing will be considered.
- H. Welding: Inspect and test during fabrication and erection of structural steel assemblies as follows:
 - 1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in the Work. Record Work required and performed to correct deficiencies.
 - 2. Inspect welds. Welds shall be visually inspected before performing any non-destructive testing. Groove weld shall be inspected by ultrasonic or other approved non-destructive test methods. Testing shall be performed to AWS D1.1 Table 6.3 cyclically loaded non-tubular connections.
 - 3. Ultrasonic testing shall be performed by a specially trained and qualified technician who shall operate the equipment, examine welds, and maintain a record of welds examined, defects found, and disposition of each defect. Repair and test defective welds.
 - 4. Rate of Testing: Completed welds contained in joints and splices shall be tested 100 percent either by ultrasonic testing or by radiography.
 - 5. Welds, when installed in column splices, shall be tested by either ultrasonic testing or radiography.
 - 6. Material discontinuities shall be reviewed based on the defect rating in accordance with the criteria of AWS D1.1 table 6.3 by the ARCHITECT and DSA.
 - 7. Other method of non-destructive testing and inspection, for example, liquid dye penetrate testing, magnetic particle inspection or radiographic inspection may be performed on weld if required.
 - 8. Lamellar Tearing: Lamellar-tearing resulting from welding is a crack (with zero tolerance) and shall be repaired in accordance with AWS D1.1.
 - 9. Lamination: The rejection criteria shall be based on ASTM A435.
 - 10. Where testing reveals lamination or conditions of lamellar tearing in base metal, the steel fabricator shall submit a proposed method of repair for review by the ARCHITECT. Test repaired areas as required.

- 11. Magnetic Particle Testing: Magnetic particle testing when required shall be provided in accordance with AWS D1.1 for procedure and technique. The standards of acceptance shall be in accordance with AWS D1.1 – Qualification.
- I. Prior Testing of Base Material: Test material before fabrication.
- J. Lines and levels of erected steel shall be certified by a State of California licensed surveyor as set forth in related Division 01 section.
- K. Welded studs shall be tested and inspected by the special inspector in accordance with requirements of AWS D1.1 – Stud Welding.
- L. Record Drawings: After steel has been erected, correct or revise Shop Drawings and erection diagrams to correspond with reviewed changes performed in the field.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Verify governing dimensions and conditions of the Work before commencing erection Work.
 - 1. Report discrepancies between drawings and field dimensions to ARCHITECT before commencing work.
 - 2. Beginning of installation means erector accepts existing conditions and surfaces underlying or adjacent to work of this section.
- B. Provide temporary shoring and bracing, and other support during performance of the Work. Remove after steel is in place and connected, and after cast-in-place concrete has reached its design strength.
- C. Coordinate prime coat repair and application with requirements of Section 09 9000.

3.02 ERECTION

- A. Install structural steel accurately in locations, to elevations indicated, and according to AISC specifications and CBC requirements.
- B. Clean surfaces of base plates and bearing plates.
 - 1. Install base and bearing plates for structural members on wedges, shims, or setting nuts as required.
 - 2. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims; cut off flush with edge of base or bearing plate before packing with grout.
- C. Maintain erection tolerances of structural steel within AISC Code of Standard Practice for Steel Buildings and Bridges.
 - 1. Architecturally Exposed Structural Steel members and components, plumbed, leveled and aligned to a tolerance not to exceed one-half the amount permitted for structural steel. CONTRACTOR to provide adjustable connections between Architecturally Exposed Structural Steel and the structural steel frame or the masonry or concrete supports, in order to provide the erector with means for adjustment.
- D. Align and adjust various members forming part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact after assembly. Perform necessary adjustments to compensate for

discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
- E. Do not permit thermal cutting during erection of structural steel.
- F. Where indicated for field connections, provide standard bolts complying with ASTM A307.
- G. Install high strength steel bolts at locations indicated. Assembly and installation shall be in accordance with CBC requirements.
 1. Allowable hole sizes: 1/16 inch larger than bolt size.
 2. Use friction type connection with standard hardened steel circular, square or rectangular washer under bolt nut.
 3. Thoroughly clean area under bolt head, nut and washer. Remove all paint, lacquer, oil or other coatings except organic zinc-rich paints in accordance with SSPC, SP-2.
 4. Tighten bolts by power torque wrench or hand wrench until twist-off.
- H. CONTRACTOR shall be responsible for correcting detailing and fabrication errors and for correct fitting of all members and components.
- I. Erect structural steel plumb and level and to proper tolerances as set forth in the AISC Manual. Provide temporary bracing, supports or connections required for complete safety of structure until final permanent connections are installed.
- J. Install column bases within a tolerance of 1/8 inch of detailed centerlines, level at proper elevations. Support bases on double nuts and solidly fill spaces under bases with cement grout.
- K. Provide anchor bolts with templates and diagrams. CONTRACTOR shall be responsible for proper location and installation of bolts. Correct deficiencies and errors.
- L. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and apply galvanizing repair paint according to ASTM A780.

3.03 FITTING

- A. Closely fit members, finished true to line and in precise position required to allow accurate erection and proper joining in the field.
- B. Drilling to enlarge unfair holes will not be allowed. Allow only enough drifting during assembly to bring parts into position, but not enough to enlarge holes or distort the metal. Do not heat rolled sections, unless approved by ARCHITECT.

3.04 PUNCHING AND DRILLING

- A. Punch material 1/16 inch larger than nominal diameter of bolt, wherever thickness of metal is equal to or less than the diameter of the bolt plus 1/8 inch.
- B. Drill or sub-punch and ream where metal is equal to or more than the diameter of the bolt plus 1/8 inch. Make diameter for sub-punched and sub-drilled holes 1/16 inch larger than nominal diameter of bolt.
- C. Precisely locate holes to ensure passage of bolt through assembled materials without drifting. Enlarge holes when necessary to receive bolts by reaming; flame cutting to enlarge holes is

not acceptable. Structural Steel members with poorly matched holes will be rejected.

3.05 FINISHING

- A. After erection, spots or surfaces where paint has been removed, damaged, or burned off, and field rivets, bolts, and other field connections shall be cleaned of dirt, oil, grease, and burned paint and furnished with a spot coat of the same primer installed during shop priming.
- B. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Install paint to exposed areas with the same material installed during shop painting. Install by brush or spray to provide a minimum dry film thickness of 1.5 mils.

3.06 FIELD QUALITY CONTROL

- A. OWNER will provide a special inspector and independent testing laboratory to perform field inspections and tests and to prepare test reports.
- B. Correct deficiencies in or remove and replace structural steel that inspections and test reports indicate do not comply with specified requirements.

3.07 CLEAN UP

- A. Remove rubbish, debris and waste materials and legally dispose of off the Project Site.

3.08 PROTECTION

- A. Protect the Work of this section until Substantial Completion.

3.09 HANDLING

- A. Both in shop and in the field, transport, handle and erect to prevent damage or overstressing of any component.

END OF SECTION

**SECTION 05 30 00
METAL DECKING**

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Floor and roof metal decking.
2. Shear connector studs for composite decking construction.
3. Edge strips, closure strips and decking accessories.

B. Related Requirements:

1. Division 01 - General Requirements.
2. Section 01 4523 - Testing and Inspection.
3. Section 03 3000 – Cast-In-Place Concrete.
4. Section 05 1200 - Structural Steel Framing.
5. Section 07 6000 - Flashing and Sheet Metal.
6. Section 07 8116 - Cementitious Fireproofing.

1.02 REFERENCES

A. ASTM International (ASTM):

1. ASTM A108 – Standard Specification for Steel Bar, Carbon and Alloy, Cold- Finished.
2. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
3. ASTM A780 – Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
4. ASTM D746 - Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.
5. ASTM D1056 - Standard Specification for Flexible Cellular Materials— Sponge or Expanded Rubber.

B. American Welding Society (AWS):

1. AWS D1.1 - Structural Welding Code Sheet – Steel.
2. AWS D1.3 – Structural Welding Code Sheet – Sheet Steel.

C. American Iron and Steel Construction (AISI):

1. AISI – Specifications for the Design of Cold-Formed Steel Structural Members.

- D. Underwriters Laboratory (UL):
 - 1. UL – Fire Resistance Directory.

1.03 PERFORMANCE REQUIREMENTS

- A. Compute properties of deck sections on basis of effective design width as limited by provisions of the AISI specifications. Provide no less than deck section properties specified, including section modulus and moment of inertia per foot of width.
- B. Regulatory Requirements:
 - 1. Decking installed as part of a fire rated assembly shall meet the requirements of the applicable UL Fire Resistance Directory design number.
 - 2. Work of this section shall be in accordance with CBC.

1.04 SUBMITTALS

- A. Shop Drawings: Drawings, sections and details indicate type of decking, location, finish, gage of metal, arrangement of sheets, necessary fabrication to incorporate decking into the Work, and relationship to openings and flashing.
- B. Product Data: For each type of decking specified, including structural properties, dimensions, profiles and finishes.
- C. Welder Certificates: Signed by CONTRACTOR certifying that welders comply with the requirements specified under Article "Quality Assurance".

1.05 QUALITY ASSURANCE

- A. General: Metal decking steel shall conform to requirements of strengths and properties of standards specified.
- B. Qualifications of Welders: Properly certified for the type of Work involved in compliance with CBC requirements.
- C. Continuous inspection of welding will be performed by a special inspector, approved by DSA to inspect the Work of this section. Refer to Section 01 4523 - Testing and Inspection. The Project Inspector will be responsible for monitoring the work of the special inspector to ensure that the inspection program is satisfactorily completed.
- D. Identification of metal decking steel shall conform to the standards specified in this section and the Drawings.
 - 1. Fabricator shall furnish sufficient evidence to the ARCHITECT attesting compliance with specified requirements.
 - 2. Conform to CBC requirements. Unclassified or unidentified decking is not permitted. Furnish deck manufacturer's certified mill analyses and test reports for each heat covering decking having a minimum F_y of 33 Ksi. In addition, for decking having F_y greater than 33 Ksi, testing laboratory shall perform one tension and elongation test and one bend or flattening test for each gage.
- E. Unidentifiable Steel: Steel which is not readily identifiable as to grade from markings and test records is not permitted to be provided as part of the Work of this section.

- F. Manufacturers shall be members of Steel Deck Institute (SDI).

1.06 DELIVERY, STORAGE AND HANDLING

- A. Protect steel deck from corrosion, deformation and other damage during delivery, storage and handling.
- B. Deck bundles shall be stored off the ground, with one end elevated to provide drainage. Bundles shall be protected against condensation with a ventilated waterproof covering.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Epic Metals Corporation.

2.02 MATERIALS

- A. Metal Decking:

1. Roll-formed sheets conforming to ASTM A653, with G90 zinc coating.
2. Section properties conforming to applicable provisions of latest edition of AISI - Specification for the Design of Cold-Formed Steel Structural Members.

- B. Flexible Closure Strips for Deck: Vulcanized, closed-cell, expanded chloroprene elastomer, complying with ASTM D1056, Grade SCE #41.

1. Brittleness Temperature: Minus 40 degrees F, ASTM D746.
2. Flammability Resistance: Self-extinguishing,

- C. Decking Accessories: Metal cover plates, sheet metal edging, metal closure strips, valley and ridge strips, seat angles, sump pans, flashings: 22 gage minimum, with ASTM A653, G90 zinc coating.

- D. Galvanizing Repair Paint: Mil. Spec. MIL-P-21035B and approved by the OWNER's Office of Environmental Health and Safety (OEHS).

2.03 FABRICATION

- A. Corrugated sheets or sections shall be designed to support required live load between supporting members.
- B. Provide decking in lengths to span over two or more supports.
- C. Except as detailed otherwise, provide decking with interlocking side laps, 2 ½-inch minimum end bearing, and 1 ½-inch minimum side bearing.
- D. Welding: Provide materials and methods in accordance with recommendations of steel decking manufacturer and reviewed submittals. Hold decking tight to the supporting elements with screws or other means for proper welding or crimping of the decking edges. Conform to AWS D1.3, and to the patterns and weld types indicated, with welds free from sharp edges and protrusions. Field coat welds and abraded surfaces at completion with an anodic type galvanizing repair paint. Omit the field paint coating where welds or abrasions are covered by concrete fill or sprayed fireproofing.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify supporting structure and existing conditions prior to starting work.
- B. Remove oil, dirt, paint, and rust from steel surfaces to which metal decking will be welded.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 OPENINGS

- A. Cut and reinforce units to provide openings which are located and dimensioned on the structural and mechanical Drawings.
- B. Provide openings, or other Work not indicated on the Drawings.

3.03 INSTALLATION

- A. Install metal decking in accordance with decking manufacturers' recommendations, requirements of Drawings, Shop Drawings, and Specifications.
- B. Install metal decking on supporting steel framework and adjust to final position before permanently fastening in place.
 - 1. Install each unit to proper bearing on supports.
 - 2. Install units in straight alignment for entire length of run of cells with close registration of cells of one unit with those of abutting unit.
 - 3. Install units to bear evenly along curved steel supports.
- C. Fasten decking to steel framework at ends of units and at intermediate supports. Welding shall be as indicated on Drawings.
- D. Fasten side laps between supports as indicated on Drawings.
- E. Perform field cutting parallel with cells in area between cells, leaving sufficient horizontal material to permit welding to support steel.
- F. Weld shear connectors to supports thru decking units as required by Drawings. Weld only on clean, dry surfaces. Do not weld shear connectors thru two layers of decking units.

3.04 METAL FLASHINGS AND CLOSURES

- A. Furnish, install, and weld in position, sheet metal closure flashing, closure angles, closure plates, profile plates, and shear plates.
- B. Close open ends of cell runs at columns, openings, walls, similar interruptions and termination.

3.05 FIELD QUALITY CONTROL

- A. Install steel decking under continuous inspection according to CBC Section 1704A.

B. Welding inspection for steel deck diaphragms shall conform to CBC Section 2204A.1.

3.06 CLEAN UP

A. Remove rubbish, debris, and waste materials and legally dispose of off the Project site.

3.07 PROTECTION

A. Protect the Work of this section until Substantial Completion.

END OF SECTION

**SECTION 05 50 00
METAL FABRICATIONS**

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

1.02 SUMMARY

- A. This section includes the following metal fabrications:
 - 1. Rough hardware.
 - 2. Ladders.
 - 3. Nosings.
 - 4. Loose bearing and leveling plates.
 - 5. Miscellaneous framing and supports for the following:
 - a. Overhead doors.
 - b. Suspended toilet partitions.
 - c. Applications where framing and supports are not specified in other sections.
 - 6. Miscellaneous steel trim.
 - 7. Laser cut handrail panels.
 - 8. Steel pipe railings.
 - 9. Cast treads and thresholds.
 - 10. Trash Enclosure Gates.
- B. Related Sections: The following sections contain requirements that relate to this section:
 - 1. Division 5 Section "Structural Steel".
 - 2. Division 5 Section "Handrails and Railings".

1.03 DEFINITIONS

- A. Definitions in ASTM E985 for railing-related terms apply to this section.

1.04 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

- B. Product data for products used in miscellaneous metal fabrications, including paint products and grout.
- C. Shop drawings detailing fabrication and erection of each metal fabrication indicated. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide templates for anchors and bolts specified for installation under other sections.
- D. Samples representative of materials and finished products as may be requested by Architect.
- E. Welder certificates signed by Contractor certifying that welders comply with requirements specified under "Quality Assurance" article.
- F. Qualification data for firms and persons specified in "Quality Assurance" article to demonstrate their capabilities and experience. Include list of completed projects with project name, addresses, names of Architects and Owners, and other information specified.

1.05 QUALITY ASSURANCE

- A. Fabricator Qualifications: Firm experienced in successfully producing metal fabrications similar to that indicated for this Project, with sufficient production capacity to produce required units without causing delay in the Work.
- B. Installer Qualifications: Arrange for installation of metal fabrications specified in this section by same firm that fabricated them.
- C. Qualify welding processes and welding operators in accordance with AWS D1.1 "Structural Welding Code - Steel," D1.3 "Structural Welding Code - Sheet Steel", and D1.2 "Structural Welding Code -Aluminum."
 - 1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

1.06 PROJECT CONDITIONS

- A. Field Measurements: Check actual locations of walls and other construction to which metal fabrications must fit, by accurate field measurements before fabrication; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of Work.

1.07 SEQUENCING AND SCHEDULING

- A. Sequence and coordinate installation of wall handrails as follows:
 - 1. Mount handrails only on completed walls. Do not support handrails temporarily by any means not satisfying structural performance requirements.
 - 2. Mount handrails only on gypsum board assemblies reinforced to receive anchors, and where the location of concealed anchor plates has been clearly marked for benefit of Installer.

PART 2 – PRODUCTS

2.01 FERRUS METALS

- A. Metal Surfaces, General: For metal fabrications exposed to view upon completion of the Work, provide materials selected for their surface flatness, smoothness, and freedom from surface blemishes. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, rolled trade names, roughness, and, for steel sheet, variations in flatness exceeding those permitted by reference standards for stretcher-leveled sheet.
- B. Steel Plates, Shapes, and Bars: ASTM A36.
- C. Rolled Steel Floor Plates: ASTM A786.
- D. Steel Bars for Gratings: ASTM A1101 or ASTM A36.
- E. Wire Rod for Grating Cross Bars: ASTM A510.
- F. Steel Tubing: Cold-formed steel tubing, ASTM A500, Grade B.
- G. Uncoated Structural Steel Sheet: Product type (manufacturing method), quality, and grade, as follows:
 - 1. Cold-Rolled Structural Steel Sheet: ASTM A1008, Grade A, unless otherwise indicated.
- H. Uncoated Steel Sheet: Commercial quality, product type (method of manufacture) as follows:
 - 1. Cold-Rolled Steel Sheet: ASTM A1008.
- I. Galvanized Steel Sheet: Quality as follows:
 - 1. Structural Quality: ASTM A653; Grade A, unless another grade required for design loading, and G90 coating designation unless otherwise indicated.
- J. Steel Pipe: ASTM A53; finish, type, and weight class as follows:
- K. Gray Iron Castings: ASTM A48, Class 30.
- L. Malleable Iron Castings: ASTM A47, grade 32510.
- M. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.
- N. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A47, or cast steel, ASTM A27. Provide bolts, washers, and shims as required, hot-dip galvanized per ASTM A153.
- O. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for the metal alloy to be welded, and as indicated on drawings.
- P. Metal Mesh/Screen: McNichols aluminum square wire mesh, designer mesh TALICA 4270 or approved equal. Provide ¼" "U" aluminum edge framing around screens, installed in aluminum window frames, for all screens at mechanical equipment towers.

2.02 NONSHRINK NONMETALLIC GROUT

- A. Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with CE CRD-C 621. Provide grout specifically recommended by manufacturer for type of application used.
- B. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include but are not limited to the following:
 - 1. SikagROUT 212 non-shrink cementitious grout.

2.03 FASTENERS

- A. General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade, and class required.
- B. Bolts and Nuts: Regular hexagon head type, ASTM A307, Grade A.
- C. Lag Bolts: Square head type, FS FF-B-561.
- D. Machine Screws: Cadmium plated steel, FS FF-S-92.
- E. Wood Screws: Flat head carbon steel, FS FF-S-111.
- F. Plain Washers: Round, carbon steel, FS FF-W-92.
- G. Drilled-In Expansion Anchors: Expansion anchors complying with FS FF-S-325, Group VIII (anchors, expansion, [nondrilling]), Type I (internally threaded tubular expansion anchor); and machine bolts complying with FS FF-B-575, Grade 5.
- H. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class, and style as required.
- I. Lock Washers: Helical spring type carbon steel, FS FF-W-84.

2.04 PAINT

- A. Shop Primer for Ferrous Metal: Manufacturer's or fabricator's standard, fast-curing, lead-free, universal modified alkyd primer selected for good resistance to normal atmospheric corrosion, for compatibility with finish paint systems indicated, and for capability to provide a sound foundation for field-applied topcoats despite prolonged exposure complying with performance requirements of FS TT-P-645.
- B. Galvanizing Repair Paint: High zinc dust content paint for regalvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035 or SSPC-Paint-20.
- C. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12 except containing no asbestos fibers.

2.05 FABRICATION, GENERAL

- A. Form metal fabrications from materials of size, thickness, and shapes indicated but not less than that needed to properly complete the work. Work to dimensions indicated using proven details of fabrication and support. Use type of materials indicated or specified for various components of each metal fabrication.

- B. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.
- C. Shear and punch metals cleanly and accurately. Remove burrs.
- D. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- E. Remove sharp or rough areas on exposed traffic surfaces.
- F. Weld corners and seams continuously to comply with AWS recommendations and the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour of welded surface matches those adjacent.
- G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.
- H. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.
- I. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- J. Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware, screws, and similar items.
- K. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

2.06 ROUGH HARDWARE

- A. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items are specified in Division 6 sections.
- B. Fabricate items to sizes, shapes, and dimensions required. Furnish malleable-iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.

2.07 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports for applications indicated or which are not a part of structural steel framework, as required to complete work.

- B. Fabricate units to sizes, shapes, and profiles indicated and required to receive adjacent other construction retained by framing and supports. Fabricate from structural steel shapes, plates, and steel bars of welded construction using mitered joints for field connection. Cut, drill, and tap units to receive hardware, hangers, and similar items.

2.08 MISCELLANEOUS STEEL TRIM

- A. Provide shapes and sizes indicated for profiles shown. Unless otherwise indicated, fabricate units from structural steel shapes, plates, and steel bars, with continuously welded joints and smooth exposed edges. Use concealed field splices wherever possible. Provide cutouts, fittings, and anchorages as required for coordination of assembly and installation with other work.

2.09 STEEL PIPE RAILINGS AND HANDRAILS

- A. General: Fabricate pipe railings and handrails to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of pipe, post spacings, and anchorage. Handrails shall be 1.25" to 1.50" outside diameter steel pipe, hot dip galvanized and Kynar paint coating per specification section 09 94 00. Handrails shall be mounted 1.50" clear from side walls, CBC Section 11B-505.5. All welded joints and surfaces shall be ground smooth, no sharp or abrasive corners, edges, or surfaces. Wall surfaces adjacent to handrails shall be smooth, CBC Section 11B-505.8
- B. Interconnect railing and handrail members by butt-welding or welding with internal connectors, at fabricator's option, unless otherwise indicated.
 - 1. At tee and cross intersections, notch ends of intersecting members to fit contour of pipe to which end is joined and weld all around.
- C. Form changes in direction of railing members by bending to preserve the contour of the member.
- D. Form simple and compound curves by bending pipe in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross-section of pipe throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of pipe.
- E. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated.
- F. Close exposed ends of pipe by welding 3/16 inch thick steel plate.
- G. Toe Boards: Where indicated, provide toe boards at railings around openings and at the edge of open-sided floors and platforms.
- H. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnections of pipe and attachment of railings and handrails to other work. Furnish inserts other anchorage devices for connecting railings and handrails to concrete or masonry work.
 - 1. For railing posts set in concrete fabricate sleeves from steel pipe with an inside diameter not less than 1/2 inch greater than the outside diameter of post, with steel plate closure welded to bottom of sleeve.
- I. Fillers: Provide steel sheet or plate fillers of thickness and size indicated or required to support structural loads of handrails where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thicknesses. Size fillers to produce adequate bearing to prevent bracket rotation and overstressing of substrate.

2.10 CAST TREADS AND THRESHOLDS

- A. Fabricate units of material, sizes, and configurations indicated. If not indicated, provide cast-iron units with integral abrasive finish. Furnish in lengths as required to accurately fit each opening or conditions.
 - 1. Cast units with an integral abrasive grit consisting of aluminum oxide, silicon carbide, or a combination of both.
- B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

American Abrasive Metals Co.
American Mason Safety Tread Co.
American Safety Tread Co., Inc.
Armstrong Products, Inc.
Safe-T-Metal Co., Inc.
Wooster Products Inc.
- C. Provide anchors for embedding units in concrete, either integral or applied to units, as standard with the manufacturer.
- D. Apply black asphaltic coating to concealed bottoms, sides, and edges of cast-iron units set into concrete.
- E. Provide a plain surface texture, except where fluted or cross-hatched surfaces are indicated.

2.11 STEEL AND IRON FINISHES

- A. Galvanizing: For those items indicated for galvanizing and all exposed items at exterior locations, apply zinc-coating by the hot-dip process compliance with the following requirements:
 - 1. ASTM A153 for galvanizing iron and steel hardware.
 - 2. ASTM A123 for galvanizing both fabricated and unfabricated iron and steel products made of uncoated rolled, pressed, and forged shapes, plates, bars, and strip 0.0299 inch thick and heavier.
- B. Preparation for Shop Priming: Prepare uncoated ferrous metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:
 - 1. Exteriors (SSPC Zone 1B): SSPC-SP6 "Commercial Blast Cleaning."
 - 2. Interiors (SSPC Zone 1A): SSPC-SP3 "Power Tool Cleaning:"
- C. Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finish or to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with requirements of SSPC-PA1 "Paint Application Specification No. 1" for shop painting.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, including concrete inserts, sleeves, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.
- B. Center nosings on tread widths with noses flush with riser faces and tread surfaces.
- C. Set sleeves in concrete with tops flush with finish surface elevations; protect sleeves from water and concrete entry.

3.02 INSTALLATION, GENERAL

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installation of miscellaneous metal fabrications. Set metal fabrication accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete masonry or similar construction.
- D. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.
- E. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, methods used in correcting welding work, and the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour of welded surface matches those adjacent.
- F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint or zinc chromate primer.

3.03 SETTING LOOSE PLATES

- A. Clean concrete and masonry bearing surfaces of any bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of bearing plates.

- B. Set loose leveling and bearing plates on wedges, or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but if protruding, cut off flush with the edge of the bearing plate before packing with grout.

- 1. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.04 INSTALLATION OF SUPPORTS FOR TOILET PARTITIONS

- A. Anchor supports securely to, and rigidly brace from, overhead building structure.

3.05 INSTALLATION OF METAL BAR GRATINGS

- A. General: Install gratings to comply with recommendations of NAAMM grating standard referenced under Part 2 that apply to grating types and bar sizes indicated, including installation clearances and standard anchoring details.
- B. Secure removable units to supporting members with type and size of clips and fasteners indicated, or if not indicated as recommended by grating manufacturer for type of installation conditions shown.
- C. Secure nonremovable units to supporting members by welding where both materials are the same; otherwise, fasten by bolting as indicated above.
- D. Attach toe plates to gratings by welding, at locations indicated.

3.06 INSTALLATION OF STEEL PIPE RAILINGS AND HANDRAILS

- A. Adjust railings prior to anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated. Plumb posts in each direction. Secure posts and railing ends to building construction as follows:
 - 1. Anchor posts in concrete by means of pipe sleeves preset and anchored into concrete. After posts have been inserted into sleeves, fill annular space between post and sleeve solid with non-shrink, non-metallic grout, mixed and placed to comply with anchoring material manufacturer's directions.
 - a. Leave anchorage joint exposed, wipe off surplus anchoring material, and leave 1/8 inch build-up, sloped away from post. For installations exposed on exterior, or to flow of water, seal anchoring material to comply with grout manufacturer's directions.
 - 2. Anchor posts to steel by welding as shown.
 - 3. Anchor rail ends into concrete and masonry with steel round flanges welded to rail ends and anchored into wall construction with lead expansion shields and bolts.
 - 4. Anchor rail ends to steel by welding as shown.
- B. Secure handrails to wall with wall brackets and end fittings. Provide bracket with not less than 1-1/2 inch clearance from inside face of handrail and finished wall surface. Locate brackets as indicated. Secure wall brackets and wall return fittings to building construction as follows:
 - 1. Use type of bracket with pre-drilled hole for exposed bolt anchorage.
 - 2. For concrete and solid masonry anchorage, use drilled-in expansion shield and either concealed hanger bolt or exposed lag bolt, as applicable.

3. For wood stud partitions, use lag bolts set into wood backing between studs. Coordinate with stud installations for accurate location of backing members.
4. For steel framed gypsum board assemblies, fasten brackets directly to steel framing or concealed anchors using self-tapping screws of size and type required to support structural loads.

3.07 INSTALLATION OF CAST TREADS AND THRESHOLDS

- A. Install cast treads and thresholds with anchorage system indicated to comply with manufacturer's recommendations.
- B. Seal thresholds exposed to exterior with elastomeric sealant complying with Division 7 Section "Joint Sealers" to provide a watertight installation.

3.08 ADJUSTING AND CLEANING

- A. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 requirements for touch-up of field painted surfaces.
 1. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- B. For galvanized surfaces clean welds, bolted connections and abraded areas and apply galvanizing repair paint to comply with ASTM A780.

END OF SECTION

**SECTION 05 55 00
MISCELLANEOUS METALS**

PART 1 – GENERAL

- A. Requirements of Division 1 apply to this Section.

1.1 WORK INCLUDED

- A. Shapes, sleeves, anchors, connectors, plates, backing plates, supports, and fastenings required but which are not specified in other Sections.
- B. Other metal fabrications indicated.

1.2 RELATED WORK SPECIFIED ELSEWHERE AS REQUIRED

- A. Setting of items to be embedded in concrete.

1.3 GENERAL REQUIREMENTS:

- A. Field conditions: Verify drawing dimensions with actual field conditions. Inspect related work and adjacent surfaces. Report all conditions which prevent proper execution of this work.
- B. Shop Drawings: Submit in accordance with Section 01340 showing incomplete detail all information required for fabrication, finishing and installation of this work.
- C. Codes: Materials and work shall conform to the governing Building Code. In case of conflict between these specifications and the Building Code, the more stringent shall govern.
- D. General: Examine all drawings and specifications and include all miscellaneous metal that is not required to be furnished by another trade. Provide all connections, anchors, bolts, and other fastenings as required. Do all cutting, punching, drilling and tapping required for proper assembly of the work.
- E. Delivery: Insure that items to be set in concrete are delivered at the proper time.

PART 2 – PRODUCTS

2.1 MATERIALS:

- A. Steel shapes: Conform to ASTM A36.
- B. Structural pipe columns: Conform to ASTM A53, Grade B.
- C. Pipe for railings: Conform to ASTM A53 or A120.
- D. Cast iron: Conform to ASTM A48, soft gray iron.
- E. Malleable iron castings: Conform to ASTM A47.
- F. Welding rods: Conform to requirements of AWS for intended use.
- G. Galvanizing: Conform to ASTM A123.
- H. Bolts, nuts, screws: Conform to ASTM A307, Grade A.

- I. Steel plate: Conform to ASTM A283, Grade A.
- J. Steel tubing: Conform to ASTM A501 or A500.
- K. Bars, flats, rounds: Conform to ASTM A36, standard grade mild steel.
- L. Primer: Conforming to FS-TT-P-86, Type I.
- M. Touch-up for galvanized surfaces: All State #321 Galvanizing Powder (30% tin, 30% zinc, 40% lead and flux), "Galvalloy", "Galvover", or approved equal.
- N. Miscellaneous material: As indicated or specified.

2.2 SHOP PRIME COAT:

- A. Ferrous metal: Properly clean and prepare for painting in compliance with the paint manufacturer's instructions and apply one shop coat of material of the type specified. Thoroughly and completely cover all exposed surfaces as well as surfaces concealed after assembly. Apply paint by brush or spray gun, as best adapted to the paint material and surface conditions. Allow paint to become dry and hard before handling.
 - 1. Apply primer to 2 mil minimum dry coat thickness and touch up after installation and leave in proper condition to receive finish coats.

2.3 GALVANIZING:

- A. Galvanize all items to be exposed on the exterior and those interior items so specified. Use the hot dip process, conforming to ASTM A123.
- B. Average weight of zinc coating per square foot of actual surface: Not less than 2.0 ounces, with no individual specimen showing less than 1.8 ounces. (One oz. of zinc corresponds to a coating thickness of 0.0017".)

2.4 FABRICATION:

- A. Using skilled mechanics, form and fabricate items of work as indicated and as required to meet installation conditions. Make provisions to connect with or receive the work of other trades.
- B. Unless otherwise indicated, weld or bolt connections between members. Where possible, conceal connections in the finished work. Where exposed screw fastenings are required, use Phillips ovalhead screws to match parent material. Fit or miter exposed joints to hairline tolerance or use welded joints. On finished surfaces, grind all welds smooth and flush with base metal.
- C. Bend pipe or tubing without collapsing or deforming the walls, and so as to provide a smooth uniform curved section and maintain uniform sectional shape.
- D. Where items are to be embedded in concrete, provide welded-on anchors or lugs as indicated or required.

PART 3 – EXECUTION

3.1 ITEMS EMBEDDED IN CONCRETE OR MASONRY:

- A. Provide bolts, eyebolts, dowels, anchors, plates, inserts, and other miscellaneous items that are to be installed in forms before concrete pouring, or for building into masonry, as indicated. Examine and check the drawings for the number, type and location of such items.

3.2 INSTALLATION:

- A. Install all items plumb, level and square, securely and rigidly attached to supporting construction and as detailed.

3.3 DESCRIPTION OF ITEMS:

- A. Those items which are of standard or stock design or which are sufficiently detailed or described on the drawings to permit their fabrication and installation, are not covered herein even though they may be included in the Scope.
- B. Backing plates in connection with studs and furring necessary for engaging and fastening of stair rail brackets, lavatories and fixtures, etc., shall be provided in locations indicated, or as necessary. Securely fasten backing plates to studs supporting members in required position. Dap into wood studs. Weld between steel studs. Finish with rust inhibitive prime coat.
- C. Pipe handrails (if shown): Fabricate from 1 1/4" standard steel pipe to shapes and dimensions indicated. Make joints flush with concealed seamless fittings. Accurately cut, miter, weld and grind smooth to flush surfaces. Make bends to preserve the contour of the pipe. All railings shall meet all disabled access requirements. Install as follows:
 - 1. To masonry walls: Provide cast brackets providing 1 1/2" min. or indicated clearance between railing and wall. Secure to wall with screws into expansion shields.
 - 2. To stud walls: Provide cast brackets providing 1 1/2" min. or indicated clearance between railing and wall. Provide proper backing at studs at proper locations before application of gypsum board. Provide collar, flush metal filler, and secure to backing.
- D. Pipe guards and bollards: standard steel pipe as shown. Galvanized after fabricated.
- E. Wrought Iron Fence and Gates: Fabricate from wrought steel square tubes as shown and to match existing. Provide all necessary operating hardware for the gates. Reinstall salvaged fence and gates as required. Fence and gates to be hot dip galvanized. Provide factory applied architectural coating over hot-dip galvanized steel "Colorgalv" by Duncan Galvanizing. Primer coat shall be factory applied prime coating. Apply primer within 12 hours after galvanizing at the same facility where the galvanizing is done. Finish coat shall be factory-applied high performance architectural finish. Apply finish coating at the galvanizer's plant, in a controlled environment as recommended by the finish coating manufacturer. Color to match existing steel fencing to remain at campus. Submit two 3 inch by 6 inch samples of factory applied coatings and colors proposed for use for approval prior to coating application. Provide 20 year warranty against rust.
- F. Other miscellaneous metal work as indicated.

END OF SECTION

**SECTION 06 10 00
ROUGH CARPENTRY**

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Supply and install Rough Carpentry work as indicated.

1.02 RELATED SECTIONS

- A. Section 01 43 00: Quality Control.
- B. Section 01 45 29: Testing and Inspection.
- C. Section 03 30 00: Cast-In-Place Concrete.

1.03 SUBMITTALS

- A. Submittals: Submit in accordance with Section 01 33 00.

1.04 QUALITY ASSURANCE

- A. All work shall be performed in accordance with the local codes and the most current DSA requirements. Where there is a question between the specifications, Architect/Contractor shall conform to the most constrictive requirement.
- B. Douglas fir, larch or hemlock structural and framing lumber shall be graded in accordance with the "Standard Grading Rules" of the West Coast Lumber Inspection Bureau (WCLIB) or the "Western Lumber Grading Rules" of the Western Wood Products Association (WWPA) latest editions.
- C. Redwood structural and framing lumber shall be graded in accordance with "Standard Specifications for Grades of California Redwood Lumber" of the Redwood Inspection Service, latest edition.
- D. Each piece of lumber shall bear official grade mark of the association under whose rules it was graded, or official grade mark of another recognized grading agency using grading rules herein specified.
- E. All 2x structural and framing members shall be air-dried to a moisture content not to exceed 19% before use.
- F. Work of this Section shall comply with provisions of current edition of UBC and Title 24, see Section 01 45 29: Testing and Inspection.
- G. Plywood shall conform to requirements of "Product Standard PS 1 issued by the U.S. Department of Commerce, and shall be grade marked by a recognized grading agency (APA and PTL).
- H. Each piece of preservative treated lumber shall be identified by the Quality Mark of an approved inspection agency in accordance with Title 24, see Section 01 45 29: Testing and Inspection.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Lumber: Structural and framing lumber shall be of the following species and grades unless noted otherwise on the drawings:

	<u>USE</u>	<u>SPECIES</u>	<u>GRADE</u>
1.	Subfloor, wall sheathing, roof sheathing and ceiling stripping.	Douglas Fir	"Construction" Board, Structural #1 only WCLIB; WWPA
2.	Beams, girders and truss members (5" and thicker, rectangular, width more than 2" greater than thickness) where exposed as finish members.	Douglas Fir WWPA	Select Structural
3.	Joists, rafters, lintels, posts, mullions and members (2" to 4" thick, 2" to 4" wide)	Douglas Fir	"Structural No. 1 Structural Light Framing, WCLIB;
4.	Other lumber (2" to 4" thick, 2" to 4" wide) not specified in subparagraph 5 above.	Douglas Fir	"Structural No. 1" and Framing WCLIB; WWPA
5.	Framing lumber (2" to 4" thick, 5" and wider).	Douglas Fir	"No. 1" and better Joists and Planks, WCLIB; WWPA.
6.	Mudsills and plates in contact with soil. treated	Douglas Fir	Same as subparagraphs 5 and 6.
7.	Sills or plates resting on concrete or masonry surfaces 6" or less above soil or finish grade.	Douglas Fir treated	Same as subparagraphs 5 and 6.
8.	Sills, foundations plates & sleepers which rest on concrete, masonry foundations, or are laid on concrete on concrete slab in direct contact with soil.	Douglas Fir treated	Same as subparagraphs 4 and 5.
9.	Miscellaneous nailing strips and blocks embedded in concrete or masonry.	Douglas Fir treated	Same as subparagraphs 4 and 5.

- B. Plywood: Plywood used for structural purposes, shall be APA grade Structural I plywood. Other plywood used for non-structural purposes shall be exterior type, or Exposure 1.

- C. Preservative Treated Wood:

1. Wood and plywood specified as treated wood shall be pressure treated wood in accordance with CBC 2303.1.8."

2. Seasoning: Treated lumber shall be air seasoned after treatment, for a minimum of 2 weeks before use.
 3. Creosote shall not be used for treating wood in contact with painted or plastered surfaces.
 4. When treated wood member has been notched, dapped, drilled or in any way cut into, such newly cut surfaces shall be painted with a heavy coat of same preservative material used in treatment of wood member.
- D. Fire Retardant Protection: Wood and plywood specified as "Fire Retardant Protected Wood" shall be treated by approved methods and materials, and shall be dried, following treatment, to a maximum moisture content as follows: Solid sawn lumber 2" in thickness or less to 19%; and plywood to 15%.
- E. Plywood subflooring shall be "Underlayment", Group 1, Exposure 1; of thickness indicated.
- F. Mineral Fiber Panels: Shall be asbestos free, thickness as indicated.
- G. Reused Materials: Sound lumber and timber which has been used for formwork may not be reused for stress carrying or non-stress carrying members. May not be used in any construction other than formwork.

PART 3 – EXECUTION

3.01 FASTENINGS

- A. Nails and Spikes:
1. Use only common wire nails or spikes.
 2. Whenever necessary to prevent splitting, holes shall be prebored for nails and spikes.
 3. Nails in plywood shall not be overdriven.
 4. Machine Applied Nailing: Use of machine nailing is subject to a satisfactory jobsite demonstration for each project and approval by the Project Architect or Structural Engineer and the Division of the State Architect Field Representative. Approval is subject to continued satisfactory performance. Machine nailing will not be approved in 5/16" plywood. If nailheads penetrate outerply more than would be normal for a hand hammer or if minimum allowable edge distances are not maintained, performance will be deemed unsatisfactory and material may be scrapped.
- B. Lag Screws:
1. When placing lag screws in a wood member, prebore lead hole as recommended in CBC Title 24 Sec 23.
 2. Lag screws which bear on wood shall be fitted with standard steel plate washers under head. Lag screws shall be screwed and not driven into place.
 3. Lag screws applied in moisture rich environments or "wet" timber shall be galvanized to prevent degradation of both the lag screw and the material.

C. Bolts:

1. Lumber and timber to be fastened together with bolts shall be clamped together and holes for bolts bored true to line.
2. Bolts shall be fitted with steel plates or standard cut washers under heads and nuts. Bolts shall be tightened when installed and again just before completion of work.
3. Bolts applied in moisture rich environments or "wet" timber shall be galvanized to prevent degradation of both the bolt and the material.

D. Wood Screws: When placing wood screws, lead holes shall be prebored as recommended in CBC Title 24. Wood screws shall be appropriately selected for the application and treated as necessary to prevent corrosion

E. Framing Anchors: Framing anchors, joist hangers, ties and other mechanical fastenings shall be galvanized or have a rust-inhibitive coating. Nails and fastenings shall be of type recommended by manufacturer.

3.02 ERECTION

A. Stud Walls, Partitions and Furring:

1. Wood stud walls, partitions and vertical furring shall be constructed of members of size and spacing indicated. Provide single plate at bottom and double plate at top unless otherwise indicated. Interior, nonbearing non-shear partitions may be capped with a single top plate, installed to provide overlapping at corners and at intersections with other wall and partitions or by metal ties as detailed.
2. Walls and partitions shall have horizontal staggered blocking not less than 2" nominal thickness and same width as studs, fitted snugly, and nailed into studs. Blocking shall be at mid-height of partition or not more than 7'-0" on center vertically. Install wood backing on top of top plate wherever necessary for nailing of lath or gypsum board.
3. Walls, partitions and furred spaces shall have 2" nominal thickness wood firestops, same width as space to be firestopped, at ceiling line, mid-height of partition and at floor line. Firestops at floor line are not required when floor is concrete. If width of opening is such that more than one piece of lumber is necessary, provide 2 thicknesses of 1" nominal material laid with staggered joints.
4. Firestops shall be placed in all stud walls and partitions, including furred spaces, so that maximum dimension of any concealed space is not over 10'-0".
5. Corners, and where wood stud walls and wood vertical furring meet, shall be formed of triple studs. Openings in stud walls and partitions shall have headers as indicated and a minimum of 2 studs at jambs, one stud of which may be cut to support header in bearing.
6. Where wood masonry or concrete walls intersect, end stud shall be fastened at top, bottom and midheight with one 1/2" diameter bolt through stud and embedded in masonry or concrete a minimum of 4". Bolts shall have washers under nuts.
7. Sills under bearing, exterior or shear walls shall be bolted to concrete with 5/8" rd. by 12" long bolts spaced not more than 4'-0" on center. There shall be a bolt

within 9" of each end of each piece of sill. Sills shall be placed and leveled with shims and washers placed and nuts tightened to level bearing after which space between sill and concrete shall be dry packed with cement grout. Non-bearing interior plates may be fastened to concrete with low velocity powder driven fasteners provided Structural Engineer's approval is obtained in writing, prior to use.

B. Beams, Girders and Joists:

1. Ends of wood beams, girders and joists which are 2'-0" or less above finished outside grade and which abut, but do not enter concrete or masonry walls, as well as wood blocking used in connection with ends of those members shall be treated with wood preservative.
2. Where wood beams, girders and joists enter masonry or concrete walls 2'-0" or less above outside wall, metal wall boxes or equivalent moisture barriers shall be provided between wood and masonry or concrete.

C. Furring: Where metal furring is not indicated or specified, provide wood furring at all points indicated and required for concealing conduit, piping, structural framing or other unfinished materials. Wood furring shall be 2x studs of required width. Vertical members contacting concrete or masonry shall be attached as specified for anchoring interior wood stud partitions.

D. Nailing Strips and Plates:

1. Provide wood nailing strips, plates and blocking indicated or required. Nailing strips in connection with metal work shall be bolted to metal. Wood nailing blocks for securing grounds shall be built into concrete, or masonry.
2. Nailing schedule shall comply to Title 24, see Section 01 45 29: Testing and Laboratory Services.

E. Wood Backing: Provide wood backing as indicated and as required to receive plumbing, electrical fixtures and equipment, cabinets, door stop plates and other fixed equipment.

END OF SECTION

**SECTION 07 26 00
UNDERSLAB VAPOR BARRIER**

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Principal work in this Section:
 - 1. Vapor barrier under concrete slabs-on-grade.

1.02 SUBMITTALS

- A. Procedure: In accordance with Section 01 33 00.
- B. Data: Manufacturer data on proposed vapor barrier.

1.03 HANDLING

- A. Procedure: In accordance with Section 01 60 20.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Vapor Barrier Sheeting: One of the following complying with ASTM E-154, with a WVT of 0.01 gr./q. ft./hr. maximum.
 - 1. Stego Wrap Vapor Barrier.
 - a. Strength: ASTM E-1745 Class A
 - b. (15 mils minimum)
 - c. Provide third party documentation that all testing was performed on a single production roll per ASTM E1745 Section 8.1.
 - 2. Reef Industries: Griffolyn VAPORguard
- B. Sealing Material: Mastic, adhesive or pressure-sensitive adhesive tape recommended by the vapor barrier manufacturer.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Verify conditions affecting the work of this Section at the site.
- B. Verify that below-grade work and items penetrating moisture barrier are complete.
- C. Make sure that detrimental conditions are corrected before proceeding with installation.

3.02 INSTALLATION

- A. Sheeting:
 - 1. Lay-out in longest possible lengths to minimize running and side joints; offset intermediate end joints in adjacent sheets not less than 4 ft.
 - 2. Spread sheeting over subgrade, smooth and even; lap edge and end joints 6 in., turn-up perimeters against concrete 2 to 3 in.

3. Seal laps and perimeters using continuous beds or strips of sealing material applied to bottom layer or tape; when using sealing material, apply top layer and press sufficiently to assure complete contact.
4. Penetrations:
 - a. Cut sheeting to fit closely and neatly.
 - b. Slip sheeting over penetrations where possible, otherwise slit from penetration hole to nearest edge.
 - c. Seal edges around penetrations.
 - d. Repair slits using 12 in. wide strips of sheeting, set centered on slit and seal each side.
5. Cuts and Accidental Tears: Repair with tape, or if too large, with patches of the vapor barrier continuously taped.

END OF SECTION

SECTION 07 41 13
PREFORMED METAL STANDING SEAM ROOFING

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

- A. This section covers the pre-finished, pre-fabricated Architectural standing seam roof system. All metal trim, accessories, fasteners, insulation and sealants indicated on the drawings as part of this section.
- B. Drawings and general provisions of the Contract, including general and Supplementary Conditions and Division 01 Specifications, apply to this section.
- C. Related Work Specified Elsewhere
 - 1. Roof Deck structural steel, flat roof systems, perimeter edge systems. Roof hatches, firestopping not included in this section.

1.2 SUMMARY

- A. Section Includes
 - 1. Factory formed Standing Seam metal roof panels
- B. Related work specified elsewhere. (Note: select from the below or add appropriate sections)
 - 1. Section 07 62 00 - Flashing and Sheet Metal

1.3 DEFINITIONS

- A. Metal Roof Panel Assembly: Metal roof panels, attachment system components, miscellaneous metal framing, thermal, and accessories necessary for a complete weather-tight roofing system.
- B. References:
 - 1. American Society for Testing and Materials (ASTM)
 - a. ASTM A 653: Steel Sheet, Zinc Coated by the Hot Dip Process
 - b. ASTM A 792: Steel Sheet, Aluminum-Zinc Alloy Coated by the Hot Dip Process
 - c. ASTM B 209: Aluminum and Aluminum Alloy Sheet and Plate
 - d. ASTM B370 Standard Specification for Copper Sheet and Strip for Building Construction.
 - 2. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
 - a. SMACNA Architectural Sheet Metal Manual, 1993 edition.
 - 3. American Iron and Steel Institute (AISI)
 - a. AISI Cold Formed Steel Design Manual
 - 4. Aluminum Association
 - a. Aluminum Design Manual
 - 5. Metal Construction Association
 - a. Preformed metal Wall Guidelines
 - 6. Code References
 - a. ASCE, Minimum Loads for Buildings and Other Structures
 - b. BOCA National Building Codes
 - c. UBC Uniform Building Code
 - d. SBC Standard Building Code

1.4 QUALITY ASSURANCE

- A. Products establish a minimum of quality required.
- B. Manufacturer and erector shall demonstrate experience of a minimum of five (5) years in this type of project.

- C. Panels shall be factory-produced only. No portable, installer-owned or installer-rented machines will be permitted.

1.5 SUBSTITUTIONS

- A. The material, products and equipment specified in this section establish a standard for required function, dimension, appearance and quality to be met by any proposed substitution.

1.6 SYSTEM DESCRIPTION

- A. Material to comply with:
 - 1. ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process

1.7 ROOF SYSTEM PERFORMANCE TESTING

- A. General Performance: Metal roof panels shall comply with performance requirements without failure due to defective manufacture, fabrication, installation or other defects in construction.
- B. Roof System shall be designed to meet Standard Building Code Wind Load requirements.
- C. Panels to meet:
 - 1. Water Penetration: When tested per ASTM E-283/1680 and ASTM E-331/1646 there shall be no uncontrolled water penetration or air infiltration through the panel joints.
 - 2. Roof System shall be designed to meet a UL Class 90 wind uplift in accordance with UL standard 580 and panel system shall be ASTM 1592 Tested and approved
 - 3. UL 2218 - Impact Resistance rated.

1.8 WARRANTIES

- A. Weather-tight warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace standing seam metal roof panel assemblies that fail to remain weather-tight, including leaks, within specified warranty period.
 - 1. Warranty Period: 20 Years from date of Substantial Completion
- B. Finish warranty: Manufacturer's standard form in which manufacturer agrees to repair finish or replace standing seam metal roof panels that show evidence of deterioration of factory-applied finish within specified warranty period.
 - 1. Exposed Panels Finish - deterioration includes the following:
 - a. Color fading more than 5 hunter units when tested according to ASTM D 2244
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214
 - c. Cracking, checking, peeling or failure of a paint to adhere to a bare metal.
 - 2. Warranty Period: 20 Years from the date of substantial completion
- C. Applicator shall furnish written warranty for a two (2) year period from date of substantial completion of building covering repairs required to maintain roof and flashings in watertight condition.

1.9 SUBMITTALS

- A. Furnish detailed drawings showing profile and gauge of exterior sheets, location and type of fasteners, location, gauges, shape and method of attachment of all trim locations and types of sealants, and any other details as may be required for a weather-tight installation.
- B. Provide finish samples of all colors specified.
- C. Shop drawings: Show fabrication and installation layouts of metal roof panels, metal wall panels or metal soffit panels, details of edge conditions, side-seam joints, panel profiles, corners, anchorages, trim, flashings, closures and accessories, and special details. Distinguish between factory and field-assembled work.

- D. Coordination Drawings: Roof plans, drawn to scale, on which the following are shown and coordinated with each other, based on input from installer of the items involved:
 - 1. Roof panels and attachments
 - 2. Metal trusses, bracings and supports
 - 3. Roof-mounted items including snow guards and items mounted on roof curbs.

1.10 DELIVERY, STORAGE AND HANDLING

- A. Ordering: Comply with manufacturer's ordering instruction and lead time requirements to avoid construction delays.
- B. Deliver components, sheets, metal roof panels and other manufactured items so as not to be damaged or deformed. Package metal roof panels for protection during transportation and handling.
- C. Unload, store and erect metal roof panels in a manner to prevent bending, warping, twisting and surface damage.
- D. Stack metal roof panels on platforms or pallets, covered with suitable weather-tight and ventilated covering. Store metal roof panels to ensure dryness. Do not store metal roof panels in contact with other materials that might cause staining, denting or other surface damage.
- E. Protect strippable protective coating on any metal coated product from exposure to sunlight and high humidity, except to the extent necessary for material installation.

1.11 PROJECT CONDITIONS

- A. Weather Limitations: proceed with installation only when existing and forecasted weather conditions permit metal roof panel work to be performed.
- B. Field Measurements: Verify actual dimensions of construction contiguous with metal roof panels by field measurements before fabrication.

1.12 COORDINATION

- A. Coordinate sizes and locations of roof curbs, equipment supports and roof penetrations with actual equipment provided.
- B. Coordinate metal roof panels with rain drainage work, flashing, trim and construction of decks, parapet walls and other adjoining work to provide a leak-proof, secure and noncorrosive installation.

PART 2 – PRODUCTS

2.1 PANEL DESIGN

- A. General: Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips in side laps. Include clips, cleats, pressure plates and accessories required for a weather-tight installation.
- B. Roof panels shall be Snap Clad standing seam in 16" widths with 1 3/4" high seam.
- C. Panels to be produced without Factory supplied hot melt mastic in the seams.
- D. Panels to be produced Smooth - Factory Standard.
- E. Panels to be designed for attachment with concealed fastener clips, spaced as required by the manufacturer to provide for both positive and negative design loads, while allowing for the expansion and contraction of the entire roof system resulting from variations in temperature.

- F. Forming: Use continuous end rolling method. No end laps on panels. No portable roll-forming machines will be permitted on this project, no installer-owned or installer-rented machines will be permitted. It is the intent of the Architect to provide Factory-Manufactured panel systems only for this project.

2.2 ACCEPTABLE MANUFACTURERS

- A. This project is detailed around the roofing product of Petersen Aluminum Corporation , Snap Clad.

2.3 MATERIALS AND FINISHES

- A. Preformed roofing panels shall be 16" wide Smooth Panel and be fabricated of 24 GA Steel
- B. Color shall be Colonial Red
- C. Finish shall be Kynar 500 or Hylar 5000 Fluorocarbon coating with a top side film thickness of 0.70 to 0.90 mil over a 0.25 to 0.3 mil prime coat to provide a total dry film thickness of 0.95 to 1.25 mil, to meet AAMA 621. Bottom side shall be coated with a primer with a dry film thickness of 0.25 mil. Finish shall conform to all tests for adhesions, flexibility and longevity as specified by Kynar 500 or Hylar 5000 finish supplier.
- D. If strippable coating to be applied on the pre-finished panels to the top side to protect the finish during fabrication, shipping and handling, film shall be removed before installation.
- E. Trim: Trim shall be fabricated of the same material and finish to match the profile, and will be press broken in lengths of 10 to 12 feet. Trim shall be formed only by the manufacturer of their approved dealer. Trim to be erected in overlapped condition. Use lap strips only as indicated on drawings. Miter conditions shall be factory welded material to match the sheeting.
- F. Closures: use composition or metal profiled closures at the top of each elevation to close ends of the panels. Metal closures to be made in the same material and finish as face sheet.
- G. Substrate shall be a minimum of 19/32" thick plywood
- H. Panels shall be installed along the rib with Snap Clad Individual Clips secured with #10 fasteners (2 per clip). The fasteners shall be of sufficient length to penetrate through the substrate a minimum of 3/16". The female rib of panel is snapped over the male rib of panel. Clips shall be spaced a maximum distance of 24" o.c. in field and 6" o.c. at perimeter and corner.
- I. Roofing Underlayment
 - 1. One fire barrier layer of GAF VersaShield Underlayment
 - 2. Ply sheet membrane to be W.R. Grace "Ice & Water Shield" a minimum of 40 mil thickness, smooth, non-granular, high temperature.
 - 3. Underlayment shall be fastened with corrosion resistant tin-caps and 12 gauge 1-1/4" annular ring-shank nails, spaced 6" o.c. at all laps and two staggered rows 12" o.c. in the field of the roll.
 - 4. Underlayment shall lap all hips and ridges at least 12" to form double thickness and shall be lapped 6" over the metal of any valley or built-in gutters and shall be installed as required by the Standing Seam Panel Manufacturer to attain the desired 20 Year Weathertightness Warranty.
- J. Sealants
 - 1. Provide two-part polysulfide class B non-sag type for vertical and horizontal joints or
 - 2. One part polysulfide not containing pitch or phenolic extenders or
 - 3. Exterior grade silicone sealant recommended by roofing manufacturer or
 - 4. One part non-sag, gun grade exterior type polyurethane recommended by the roofing manufacturer.

2.4 FABRICATION

- A. Comply with dimensions, profile limitations, gauges and fabrication details shown and if not shown, provide manufacturer's standard product fabrication.
- B. Fabricate components of the system in factory, ready for field assembly.

- C. Fabricate components and assemble units to comply with fire performance requirements specified.
- D. Apply specified finishes in conformance with manufacturer's standard, and according to manufacturer's instructions.

PART 3 – EXECUTION

3.1 INSPECTION

- A. Examine alignment of structural steel and related supports, primary and secondary roof framing, solid roof sheathing, prior to installation.
- B. For the record, prepare written report, endorsed by installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 FASTENERS

- A. Secure units to supports
- B. Place fasteners as indicated in manufacturer's standards.

3.3 INSTALLATION

- A. Panels shall be installed plumb and true in a proper alignment and in relation to the structural framing. The erector must have at least five years successful experience with similar applications.
- B. Install metal panels, fasteners, trim and related sealants in accordance with approved shop drawings and as may be required for a weather-tight installation.
- C. Remove all strippable coating and provide a dry-wipe down cleaning of the panels as they are erected.

3.4 DAMAGED MATERIAL

- A. Upon determination of responsibility, repair or replace damaged metal panels and trim to the satisfaction of the Architect and Owner.

END OF SECTION

**SECTION 07 55 00
MODIFIED BITUMINOUS MEMBRANE ROOFING**

1.00 - GENERAL

1.01 SECTION INCLUDES

- A. Cold Applied 3-Ply Asphalt Roofing (StressPly). (2.02)(3.04).

1.02 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry.
- B. Section 07 21 00 – Building Insulation.
- C. Section 07 62 00 - Sheet Metal Flashing and Trim.
- D. Section 08 62 23 – Tubular Daylighting Devices.

1.03 REFERENCES

- A. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
- B. ASTM D 312 - Standard Specification for Asphalt used in Roofing.
- C. ASTM D 451 - Standard Test Method for Sieve Analysis of Granular Mineral Surfacing for Asphalt Roofing Products.
- D. ASTM D 1970 - Specification for Sheet Materials, Self-Adhering Polymer Modified Bituminous, Used as Steep Roofing Underlayment for Ice Dam Protection.
- E. ASTM D 1079 Standard Terminology Relating to Roofing, Waterproofing and Bituminous Materials.
- F. ASTM D 1227 Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing.
- G. ASTM D 1863 Standard Specification for Mineral Aggregate Used as a Protective Coating for Roofing.
- H. ASTM D 2178 Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
- I. ASTM D 4586 Standard Specification for Asphalt Roof Cement, Asbestos-Free.
- J. ASTM D 4601 Standard Specification for Asphalt Coated Glass Fiber Base Sheet Used in Roofing.
- K. ASTM D 5147 Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials.

- L. ASTM D 6162 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.
- M. ASTM D 6163 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.
- N. ASTM D 6164 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
- O. ASTM D 6757 - Standard Specification for Underlayment Felt Containing Inorganic Fibers Used in Steep-Slope Roofing.
- P. ASTM E 108 - Standard Test Methods for Fire Test of Roof Coverings
- Q. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual.
- R. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.
- S. Underwriters Laboratories, Inc. (UL): Fire Hazard Classifications.
- T. Warnock Hersey (WH): Fire Hazard Classifications.
- U. ANSI-SPRI ES-1 Wind Design Standard for Edge Systems used with Low Slope Roofing Systems.
- V. ASCE 7, Minimum Design Loads for Buildings and Other Structures
- W. UL - Fire Resistance Directory.
- X. Miami-Dade Building Code Compliance - N.O.A. (Notice of Acceptance).
- Y. California Title 24 Energy Efficient Standards.

1.04 PERFORMANCE REQUIREMENTS

- A. Perform work in accordance with all federal, state and local codes.
- B. Exterior Fire Test Exposure: Roof system shall achieve a UL or WH Class rating for roof slopes indicated on the Drawings as follows:
 - 1. Underwriters Laboratory Class A Rating.
 - 2. Warnock Hersey Class A Rating.
- C. Design Requirements:
 - 1. Uniform Wind Uplift Load Capacity
 - a. Installed roof system shall withstand negative (uplift) design wind loading pressures complying with the following criteria.
 - 1) Design Code: ASCE 7, Method 2 for Components and Cladding.
 - 2. Live Load: 20 psf, or not to exceed original building design.
 - 3. Dead Load:

- a. Installation of new roofing materials shall not exceed the dead load capacity of the existing roof structure.
- D. Energy Star: Roof System shall comply with the initial and aged reflectivity required by the U.S. Federal Government's Energy Star program.
- E. Roof system shall have been tested in compliance with the following codes and test requirements:
 - 1. Miami-Dade County:
 - a. Modified Bitumen Roofing Membrane Systems Over
 - 1) Wood Decks N.O.A.
 - 2. Cool Roof Rating Council:
 - a. CRRC Directory CRRC
 - 3. International Code Council Evaluation Service (ICC-ES):
 - a. Membrane Systems
 - 1) ESR-3460
 - 4. Warnock Hersey
 - a. ITS Directory of Listed Products
 - 5. FM Approvals:
 - a. RoofNav Website

1.05 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation instructions.
- C. Shop Drawings: Submit shop drawings including installation details of roofing, flashing, fastening, insulation and vapor barrier, including notation of roof slopes and fastening patterns of insulation and base modified bitumen membrane, prior to job start.
- D. Design Pressure Calculations: Submit design pressure calculations for the roof area in accordance with ASCE 7 and local Building Code requirements. Include a roof system attachment analysis report, certifying the system's compliance with applicable wind load requirements before Work begins.
- E. For each modified bituminous membrane ply product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
- F. Manufacturer's Certificates: Provide to certify products meet or exceed specified requirements.
- G. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with ASTM D5147. Testing must be performed at 77 deg. F. Tests at 0 deg. F will not be considered.

- H. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic inspection and maintenance of all completed roofing work. Provide product warranty executed by the manufacturer. Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

1.06 QUALITY ASSURANCE

- A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified with documented ISO 9001 certification and minimum of twelve years of documented experience and must not have been in Chapter 11 bankruptcy during the last five years.
- C. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience and a certified Pre-Approved Garland Contractor.
- D. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress.
- E. Product Certification: Provide manufacturer's certification that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.
- F. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

1.07 PRE-INSTALLATION MEETINGS

- A. Convene minimum two weeks prior to commencing Work of this section.
- B. Review installation procedures and coordination required with related Work.
- C. Inspect and make notes of job conditions prior to installation:
 - 1. Record minutes of the conference and provide copies to all parties present.
 - 2. Identify all outstanding issues in writing designating the responsible party for follow-up action and the timetable for completion.
 - 3. Installation of roofing system shall not begin until all outstanding issues are resolved to the satisfaction of the Architect.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging with labels intact until ready for installation.
- B. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.

- C. Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface except store KEE-Stone FB 60 rolls flat on a clean flat surface. No wet or damaged materials will be used in the application.
- D. Store at room temperature wherever possible, until immediately prior to installing the roll. During winter, store materials in a heated location with a 50 degree F (10 degree C) minimum temperature, removed only as needed for immediate use. Keep materials away from open flame or welding sparks.
- E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.
- F. Adhesive storage shall be between the range of above 50 degree F (10 degree C) and below 80 degree F (27 degree C). Area of storage shall be constructed for flammable storage.

1.09 PROJECT CONDITIONS

- A. Coordinate Work with installing associated metal flashings as work of this section proceeds.
- B. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.10 WARRANTY

- A. Upon completion of the work, provide the Manufacturer's written and signed NDL Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due either to defective material or defective workmanship by the installing contractor, the manufacturer shall provide the Owner, at the Manufacturer's expense, with the labor and material necessary to return the defective area to a watertight condition.
 - 1. Warranty Period: 30 years from date of acceptance.
- B. Installer is to guarantee all work against defects in materials and workmanship for a period indicated following final acceptance of the Work.
 - 1. Warranty Period: 5 years from date of acceptance.

2.00 - PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Garland Company, Inc. (The); 3800 E. 91st St., Cleveland, OH 44105. ASD. Toll Free: 800-321-9336. Phone: 216-641-7500. Fax: 216-641-0633. Web Site: www.garlandco.com. Local Rep: Jason Moronolte (661) 889-0449. jmoronolte@garlandind.com
- B. Or Equal
- C. The Products specified are intended and the Standard of Quality for the products required for this project. If other products are proposed the bidder must disclose in the bid the manufacturer and the products that they intend to use on the Project. If no manufacturer and products are listed, the bid may be accepted only with the use of products specified.

1. Bidder will not be allowed to change materials after the bid opening date.
2. If alternate products are included in the bid, the products must be equal to or exceed the products specified. Supporting technical data shall be submitted to the Architect/ Owner for approval prior to acceptance.
3. In making a request for substitution, the Bidder/Roofing Contractor represents that it has:
 - a. Personally investigated the proposed product or method, and determined that it is equal or superior in all respects to that specified.
 - b. Will provide the same guarantee for substitution as for the product and method specified.
 - c. Will coordinate installation of accepted substitution in work, making such changes as may be required for work to be completed in all respects.
 - d. Will waive all claims for additional cost related to substitution, which consequently become apparent.
 - e. Cost data is complete and includes all related cost under his/her contract or other contracts, which may be affected by the substitution.
 - f. Will reimburse the Owner for all redesign cost by the Architect for accommodation of the substitution.
 - g. Architect/ Owner reserves the right to be the final authority on the acceptance or rejection of any or all bids, proposed alternate roofing systems or materials that has met ALL specified requirement criteria.
 - h. Failure to submit substitution package, or any portion thereof requested, will result in immediate disqualification and consideration for that particular contractors request for manufacturer substitution.

2.02 COLD APPLIED 3-PLY ASPHALT ROOFING

- A. Nailable Base Sheet: One ply fastened to the deck per wind uplift calculations.
 1. HPR Premium Glasbase
- B. Base (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
 1. HPR Glasbase
- C. Modified Cap (Ply) Sheet: One ply bonded to the prepared substrate with interply Adhesive.
 1. StressPly FR Mineral
- D. Interply Adhesive: (1 and 2)
 1. Weatherking Plus WC: applied at 2 ½ gallons per square
- E. Flashing Base Ply: One ply bonded to the prepared substrate with Interply Adhesive: except torch sheet.
 1. HPR Tri-Base Premium
- F. Flashing Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
 1. StressPly Plus FR Mineral
- G. Flashing Ply Adhesive:
 1. Weatherking Flashing Adhesive: applied at 2 ½ gallons per square
- H. Surfacing: Requires 30 days wait before applying.
 1. Surface Coatings

- a. Pyramic Plus LO: Installed in a two-coat application at 1.5 gallons per 100sf per coat for a total coverage of 3 gallons per 100sf

2.03 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

- A. Pre-Manufactured Coping Cap: R-Mer Edge Coping Cap Cover and Splice Plate.
 - 1. Zinc-coated steel, ASTM A653, coating designation G-90, in thickness of 24 gauge, 22 gauge or 20 gauge, 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.
- B. Pre-Manufactured Coping Cap: R-Mer Edge Coping Chairs
 - 1. Zinc-coated steel, ASTM A653, coating designation G-90, in thickness of 0.0635 nom./ 16 gauge, 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.
- C. Pre-Manufactured Edge Metal Finishes:
 - 1. Exposed and unexposed surfaces for mill finish flashing, fascia, and coping cap, as shipped from the mill
 - 2. Exposed surfaces for coated panels:
 - a. Steel Finishes: fluorocarbon finish. Epoxy primer baked both sides, .2-.25 mils thickness as approved by finish coat manufacturer. Weathering finish as referred by National Coil Coaters Association (NCCA). Provided with the following properties.
 - 1) Pencil Hardness: ASTM D3363, HB-H / NCCA II-2.
 - 2) Bend: ASTM D-4145, O-T / NCCA II-19
 - 3) Cross-Hatch Adhesion: ASTM D3359, no loss of adhesion
 - 4) Gloss (60 deg. angle): ASTM D523, 25+/-5%
 - 5) Reverse Bend: ASTM D2794, no cracking or loss of adhesion
 - 6) Nominal Thickness: ASTM D1005
 - a) Primer: 0.2 mils
 - b) Topcoat, 0.7 mils min
 - c) Clear Coat (optional, only used with 22 ga. steel) 0.3 mils
 - 7) Color: Provide as specified. (Subject to minimum quantities)
- D. Vents and Breathers: Heavy gauge aluminum and fully insulated vent that allows moisture and air to escape but not enter the roof system as recommended and furnished by the membrane manufacturer.
- E. Pitch pans, Rain Collar 24 gauge stainless or 20oz (567gram) copper. All joints should be welded/soldered watertight. See details for design.
- F. Drain Flashings should be 4lb (1.8kg) sheet lead formed and rolled.
- G. Plumbing stacks should be 4lb (1.8kg) sheet lead formed and rolled.
- H. Liquid Flashing - Tuff-Flash: An asphaltic-polyurethane, low odor, liquid flashing material designed for specialized details unable to be waterproofed with typical modified membrane flashings.

1. Tensile Strength, ASTM D 412: 400 psi
 2. Elongation, ASTM D 412: 300%
 3. Density @77 deg. F 8.5 lb/gal typical
- I. Fabricated Flashings: Fabricated flashings and trim
1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the CDA Copper Development Association "Copper in Architecture - Handbook" as applicable.
- J. Manufactured Roof Specialties: Shop fabricated copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim
1. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the NRCA "Roofing and Waterproofing Manual" as applicable.

3.00 - EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Inspect and approve the deck condition, slopes and fastener backing if applicable, parapet walls, expansion joints, roof drains, stack vents, vent outlets, nailers and surfaces and elements.
- C. Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.
- D. If substrate preparation and other conditions are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. General: Clean surfaces thoroughly prior to installation.
 1. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
 2. Fill substrate surface voids that are greater than 1/4 inch wide with an acceptable fill material.
 3. Roof surface to receive roofing system shall be smooth, clean, free from loose gravel, dirt and debris, dry and structurally sound.
 4. Wherever necessary, all surfaces to receive roofing materials shall be power broom and vacuumed to remove debris and loose matter prior to starting work.
 5. Do not apply roofing during inclement weather. Do not apply roofing membrane to damp, frozen, dirty, or dusty surfaces.
 6. Fasteners and plates for fastening components mechanically to the substrate shall provide a minimum pull-out capacity of 300 lbs. (136 k) per fastener. Base or ply sheets attached with cap nails require a minimum pullout capacity of 40 lb. per nail.
 7. Prime decks where required, in accordance with requirements and recommendations of the primer and deck manufacturer.

3.03 INSTALLATION - GENERAL

- A. Install modified bitumen membranes and flashings in accordance with manufacturer's instructions and with the recommendations provided by the National Roofing Contractors Association's Roofing & Waterproofing Manual, the Asphalt Roofing Manufacturers Association, and applicable codes.
- B. General: Avoid installation of modified bitumen membranes at temperatures lower than 40-45 degrees F. When work at such temperatures unavoidable use the following precautions:
 - 1. Take extra care during cold weather installation and when ambient temperatures are affected by wind or humidity, to ensure adequate bonding is achieved between the surfaces to be joined. Use extra care at material seam welds and where adhesion of the applied product to the appropriately prepared substrate as the substrate can be affected by such temperature constraints as well.
 - 2. Unrolling of cold materials, under low ambient conditions must be avoided to prevent the likelihood of unnecessary stress cracking. Rolls must be at least 40 degrees F at the time of application. If the membrane roll becomes stiff or difficult to install, it must be replaced with roll from a heated storage area.
- C. Commence installation of the roofing system at the lowest point of the roof (or roof area), working up the slope toward the highest point. Lap sheets shingle fashion so as to constantly shed water
- D. All slopes greater than 2:12 require back-nailing to prevent slippage of the ply sheets. Use ring or spiral-shank 1-inch cap nails, or screws and plates at a rate of 1 fastener per ply (including the membrane) at each insulation stop. Place insulation stops at 16 ft o.c. for slopes less than 3:12 and 4 feet o.c. for slopes greater than 3:12. On non-insulated systems, nail each ply directly into the deck at the rate specified above. When slope exceeds 2:12, install all plies parallel to the slope (strapping) to facilitate backnailing. Install 4 additional fasteners at the upper edge of the membrane when strapping the plies.

3.04 INSTALLATION COLD APPLIED ROOF SYSTEM

- A. Base Ply: Cut base ply sheets into 18 foot lengths and allow plies to relax before installing. Install base sheet in Interply Adhesive: applied at the rate required by the manufacturer. Shingle base sheets uniformly to achieve one ply throughout over the prepared substrate. Shingle in proper direction to shed water on each large area of roofing.
 - 1. Lap ply sheet ends 8 inches. Stagger end laps 12 inches minimum.
 - 2. Solidly bond to the substrate and adjacent ply with specified cold adhesive at the rate of 2 to 2-1/2 gallons per 100 square feet.
 - 3. Roll must push a puddle of adhesive in front of it with adhesive slightly visible at all side laps. Use care to eliminate air entrapment under the membrane.
 - 4. Install subsequent rolls of modified across the roof as above with a minimum of 4 inch side laps and 8 inch staggered end laps. Lay modified membrane in the same direction as the underlayers but the laps shall not coincide with the laps of the base layers.
 - 5. Extend plies 2 inches beyond top edges of cants at wall and projection bases.
 - 6. Install base flashing ply to all perimeter and projection details.
 - 7. Allow the one ply of base sheet to cure at least 30 minutes before installing the modified membrane. However, the modified membrane must be installed the same day as the base plies.

- B. Modified Cap Ply(s): Cut cap ply sheets into 18 foot lengths and allow plies to relax before installing. Install in interplay adhesive applied at the rate required by the manufacturer. Shingle sheets uniformly over the prepared substrate to achieve the number of plies specified. Shingle in proper direction to shed water on each large area of roofing.
1. Lap ply sheet ends 8 inches. Stagger end laps 12 inches minimum.
 2. Solidly bond to the base layers with specified cold adhesive at the rate of 2 to 2-1/2 gallons per 100 square feet.
 3. Roll must push a puddle of adhesive in front of it with adhesive slightly visible at all side laps. Care should be taken to eliminate air entrapment under the membrane.
 4. Install subsequent rolls of modified across the roof as above with a minimum of 4 inch side laps and 8 inch staggered end laps. Lay modified membrane in the same direction as the underlayers but the laps shall not coincide with the laps of the base layers.
 5. Allow cold adhesive to set for 5 to 10 minutes before installing the top layer of modified membrane.
 6. Extend membrane 2 inches beyond top edge of all cants in full moppings of the cold adhesive as shown on the Drawings.
- C. Fibrous Cant Strips: Provide non-combustible perlite or glass fiber cant strips at all wall/curb detail treatments where angle changes are greater than 45 degrees. Cant may be set in approved cold adhesives, hot asphalt or mechanically attached with approved plates and fasteners.
- D. Wood Blocking, Nailers and Cant Strips: Provide wood blocking, nailers and cant strips as specified in Section 06114.
1. Provide nailers at all roof perimeters and penetrations for fastening membrane flashings and sheet metal components.
 2. Wood nailers should match the height of any insulation, providing a smooth and even transition between flashing and insulation areas.
 3. Nailer lengths should be spaced with a minimum 1/8 inch gap for expansion and contraction between each length or change of direction.
 4. Nailers and flashings should be fastened in accordance with Factory Mutual "Loss Prevention Data Sheet 1- 49, Perimeter Flashing" and be designed to be capable of resisting a minimum force of 200 lbs/lineal foot in any direction.
- E. Metal Work: Provide metal flashings, counter flashings, parapet coping caps and thru-wall flashings as specified in Section 07620 or Section 07710. Install in accordance with the SMACNA "Architectural Sheet Metal Manual" or the NRCA Roofing Waterproofing manual.
- F. Termination Bar: Provide a metal termination bar or approved top edge securement at the terminus of all flashing sheets at walls and curbs. Fasten the bar a minimum of 8 inches (203 mm) o/c to achieve constant compression. Provide suitable, sealant at the top edge if required.
- G. Flashing Base Ply: Install flashing sheets by the same application method used for the base ply.
1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.

2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
3. Adhere to the underlying base ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
4. Solidly adhere the entire flashing ply to the substrate. Secure the tops of all flashings that are not run up and over curb through termination bar fastened at 6 inches (152 mm) O.C. and sealed at top.
5. Seal all vertical laps of flashing ply with a three-course application of trowel-grade mastic and fiberglass mesh.
6. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
7. Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work.
8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.

H. Flashing Cap Ply:

1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
3. Adhere to the underlying base flashing ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
4. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
5. Coordinate roof accessories, miscellaneous sheet metal accessory items with the roofing system work.
6. All stripping shall be installed prior to flashing cap sheet installation.
7. Heat and scrape granules when welding or adhering at cut areas and seams to granular surfaces at all flashings.
8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.

I. Surface Coatings: Apply roof coatings in strict conformance with the manufacturer's recommended procedures.

J. Roof Walkways: Provide walkways in areas indicated on the Drawings.

3.05 CLEANING

A. Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles and other debris resulting from these operations.

- B. Remove asphalt markings from finished surfaces.
- C. Repair or replace defaced or disfigured finishes caused by Work of this section.

3.06 PROTECTION

- A. Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes and the like to protect personnel, roofs and structures, vehicles and utilities.
- B. Protect exposed surfaces of finished walls with tarps to prevent damage.
- C. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch (16 mm) thick.
- D. In addition to the plywood listed above, an underlayment of minimum 1/2 inch (13 mm) recover board is required on new roofing.
- E. Special permission shall be obtained from the Manufacturer before any traffic shall be permitted over new roofing.

3.07 FIELD QUALITY CONTROL

- A. Inspection: Provide manufacturer's field observations at start-up and at intervals of approximately 30 percent, 60 percent and 90 percent completion. Provide a final inspection upon completion of the Work.
 - 1. Warranty shall be issued upon manufacturer's acceptance of the installation.
 - 2. Field observations shall be performed by a Sales Representative employed full-time by the manufacturer and whose primary job description is to assist, inspect and approve membrane installations for the manufacturer.
 - 3. Provide observation reports from the Sales Representative indicating procedures followed, weather conditions and any discrepancies found during inspection.
 - 4. Provide a final report from the Sales Representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good general roofing practice.

3.08 SCHEDULES

A. Base (Ply) Sheet:

- 1. HPR Glasbase: ASTM D 4601 Type II Base Sheet , Asphalt saturated fiberglass base sheet.
 - a. Meets or Exceeds ASTM D 4601 Type II Performance Criteria.

B. Thermoplastic/Modified Cap (Ply) Sheet:

- 1. StressPly FR Mineral: 145 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced, rubber modified roofing membrane with fire retardant characteristics, and dual fiberglass reinforced scrim. ASTM D 6163, Type III Grade G
 - a. Tensile Strength, ASTM D 5147
 - 1) 2 in./min. @ 73.4 +/- 3.6 deg. F MD 225 lbf/in XD 225 lbf/in
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 39.0 kN/m XD 39.0 kN/m

- b. Tear Strength, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 300 lbf XD 300 lbf
 - 2) (50 mm/min. @ 23 +/- 2 deg. C MD 1335 N XD 1335 N
- c. Elongation at Maximum Tensile, ASTM D 5147
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 6% XD 8%
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 6% XD 8%
- d. Low Temperature Flexibility, ASTM D 5147, Passes -15 deg. F (-26 deg. C)

C. Interply Adhesive:

- 1. Weatherking Plus WC: Rubberized, polymer modified cold process asphalt roofing bitumen V.O.C. compliant ASTM D 3019. Performance Requirements:
 - a. Non-Volatile Content ASTM D 4479 78%
 - b. Density ASTM D1475 9.0 lbs./gal.
 - c. Viscosity Stormer ASTM D562 900-1100 grams
 - d. Flash Point ASTM D 93 100 deg. F min. (37 deg. C)
 - e. Slope: up to 2:12
 - f. V.O.C. ASTM D 3960 Less than 250 g/l
 - g. Flash Point ASTM D 93 105 deg. F
 - h. Slope maximum 1:12

D. Flashing Base Ply:

- 1. HPR Tri-Base Premium: 60 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass and polyester composite scrim, performance requirements according to ASTM D 5147.
 - a. Tensile Strength, ASTM D 5147:
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F: MD 330 lbf/in XD 330 lbf/in
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 57.5 kN/m XD 57.5 kN/m
 - b. Tear Strength, ASTM D5147:
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 550 lbf XD 550 lbf
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 2446 N XD 2446 N
 - c. Elongation at Maximum Tensile, ASTM D5147:
 - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 7% XD 9%
 - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 7% XD 9%

E. Flashing Ply Adhesive:

- 1. Weatherking Flashing Adhesive: Brush grade flashing adhesive.
 - a. Non-Volatile Content ASTM D 4479 70 min.
 - b. Density ASTM D 1475 8.6 lbs./gal. (1kg/l)
 - c. Flash Point ASTM D 93 100 deg. F (37 deg. C)

F. Surfacing:

- 1. Flashing Cap (Ply) Sheet:
 - a. StressPly Plus FR Mineral: 155 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced, rubber modified roofing membrane reinforced with a fiberglass and polyester composite scrim. ASTM D 6162, Type III Grade G
 - 1) Tensile Strength, ASTM D 5147

- a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 310 lbf/in XD 310 lbf/in
 - b) 50 mm/min. @ 23 +/- 2 deg. C MD 54.25 kN/m XD 54.25 kN/m
 - 2) Tear Strength, ASTM D 5147
 - a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 500 lbf XD 500 lbf
 - b) 50 mm/min. @ 23 +/- 2 deg. C MD 2224 N XD 2224 N
 - 3) Elongation at Maximum Tensile, ASTM D 5147
 - a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 8% XD 8%
 - b) 50 mm/min. @ 23 +/- 2 deg. C MD 8% XD 8%
 - 4) Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F (-34 deg. C)
2. Surface Coatings:
- a. Surfacing:
 - 1) Pyramic Plus LO: White elastomeric roof coating, Energy Star approved acrylic roof coating:
 - a) Weight/Gallon 12 lbs./gal. (1.44 g/cm³)
 - b) Non-Volatile % (ASTM D 1644) 66 min
 - c) Reflectance 81%

END OF SECTION

SECTION 07 57 00
DEX - FLEX WATERPROOF TRAFFIC COATING SYSTEM

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.02 WORK INCLUDED

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the waterproof deck system as scheduled on the drawings and/or specified herein.

1.03 RELATED WORK

- A. Concrete:
 - 1. Concrete slab should be either water cured or cured using sodium silicate curing compounds only. Other types of curing compounds are generally not acceptable. Concrete should be cured for a minimum of 28 days with a maximum moisture content of 7% per ASTM F1869. Concrete substrate should meet or exceed ACI 302 or ACI 318 depending on design considerations. Concrete should be pitched for drainage.
- B. Drains:
 - 1. Drains, clean-outs, etc. should be of the "floor-flange" type as manufactured for use with composition substrates by most major drain manufacturers. Drain flange shall be finished with substrate. Bi-Level drains shall be used with mortar bed installations.
- C. Slope for drainage:
 - 1. Allow minimum 1/4 inch per foot slope to drain. This can be provided for in the substrate or by application of Dex-O-Tex A-81 or High Strength Mortar Underlayment. Care must be taken to provide adequate elevation at thresholds to provide proper slope to drain.

1.04 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections:
 - 1. Product Data: Submit manufacturer's technical data sheet.
- B. Samples for initial selection purposes in form of manufacturer's recommended installation procedures for specific application parameters.
- C. Maintenance Instructions: Submit manufacturer's written instructions for recommended maintenance practices.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who has a minimum of 5 years experience installing similar materials, and who is certified as factory trained by manufacturer of primary materials. Contractor must demonstrate they are qualified in the installation of waterproof deck materials types similar to those specified for this Project and who offers a joint labor and material warranty with manufacturer of primary materials. **Contact Brandon Carpenter for Dex-O-Tex Applicators and other information: Phone: 619-865-0479 or Email: brandonc@cpcmail.net.**

- B. Single-Source Responsibility: Obtain waterproof traffic coating membrane materials, including primers, underlayment, copolymer, as well as protective coatings and wearing surface, and finish or sealing coats if required, from a single manufacturer.
- C. Pre-Qualified Materials: Submit any request for alternative products for review two weeks prior to bid date. Any request for alternate products received after this date will not be considered.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original packages and containers with seals unbroken and bearing manufacturer's labels containing brand name and directions for storage and mixing with other components.
- B. Comply with manufacturer's directions for materials storage to prevent deterioration from moisture, heat, cold, direct sunlight, or other detrimental effects.

1.07 PROJECT CONDITIONS

- A. Environmental Conditions: Comply with waterproof deck system manufacturer's directions for maintenance of ambient and substrate temperature, moisture, humidity, ventilation, and other conditions required to execute and protect work.

1.08 WARRANTY

- A. Provide a two-year joint manufacturer installer warranty.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Basis of Design: Waterproof traffic coating system shall be Dex-O-Tex Dex-Flex for concrete as manufactured by Crossfield Products Corp.; Rancho Dominguez, California and Cibolo, Texas.
- B. Primer shall be Dex-O-Tex VL Primer as manufactured by Crossfield Products Corp.; Rancho Dominguez, California and Cibolo, Texas.
- C. Waterproof membrane shall be Dex-O-Tex Cemceil as manufactured by Crossfield Products Corp.; Rancho Dominguez, California and Cibolo, Texas.
- D. Detail membrane shall be Dex-O-Tex Barrier-Guard with fabric reinforcement as manufactured by Crossfield Products Corp.; Rancho Dominguez, California and Cibolo, Texas.
- E. Texture coats shall be Dex-O-Tex Resistite as manufactured by Crossfield Products Corp.; Rancho Dominguez, California and Cibolo, Texas.
- F. Color sealer shall be Dex-O-Tex AJ-44 as manufactured by Crossfield Products Corp.; Rancho Dominguez, California and Cibolo, Texas.

2.02 PROPERTIES

- A. Membrane Physical Properties: Provide a waterproof deck system that meets or exceeds the listed minimum physical property requirements when tested according to the referenced standard test methods in parentheses.

TYPICAL PHYSICAL PROPERTIES at 75°F (24°C)

Waterproofness: No Passage of Water Resistance to passage when Subject to 27.7" head of water (Hydrostatic pressure of 1 lb./ft.) for one month.

Elongation: ASTM D638, 580%.

Tensile Strength: ASTM D638, 345 psi.

Adhesion in Peel to Concrete: ASTM C794, 8.3 lbs. (pounds per inch width).

Moisture Vapor Transmission: ASTM E96, 2.04 gr.

Crack-Bridging: ASTM E836, 1/8" opening, no rupture.

Hydrostatic Resistance: ASTM D751 Passes Procedure.

Permeability: ASTM E960.13 perm/in.

Antimicrobial Resistance: ASTM G21, Passes.

- B. IAPMO and ANSI Compliance Requirement:
Copolymer waterproofing membrane shall have IAPMO (International Association of Plumbing and Mechanical Officials) and ANSI (American National Standards Institute) compliance.
 - 1. IAPMO File No. Certification.
 - 2. ANSI A118.10-99 manufactured compliance.

PART 3 – EXECUTION

3.01 CONTRACTOR QUALIFICATIONS

- A. Waterproof traffic coating system shall be installed in strict accordance with the manufacturer's recommendations by a contractor trained and approved by the materials manufacturer and has a minimum five years experience in the application of similar materials.

3.02 INSPECTION

- A. Examine the areas and conditions where the waterproof traffic coating system is to be installed and notify the Architect of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected by the Contractor in a manner acceptable to the Architect.
- B. Evaluate level of moisture in the substrate to determine that moisture levels are acceptable for application of specified waterproof deck system.

3.03 PREPARATION

- A. Substrate: Perform surface preparation in accordance with ICRI Guideline No. 03732 with CSP of 2 to 3 and cleaning procedures according to manufacturer's instructions for particular substrate conditions involved, and as specified. Provide clean, dry and neutral substrate for application of waterproof deck covering.
- B. Materials: Pre-mix aqueous copolymer per manufacturer's instructions. Prepare materials according to waterproof traffic coating system manufacturer's instructions.

3.04 FIELD CONDITIONS

- A. Waterproof traffic coating system shall not be applied during either freezing or inclement weather, or when such weather can logically be expected.

3.05 APPLICATION

- A. General: Apply each component of waterproof traffic coating according to manufacturer's directions to produce a uniform monolithic surface of thickness indicated.
- B. Primer Coat: Apply the primer in the selected color as recommended. Allow to dry.
- C. Detail Membrane: Apply eight-inch wide detail membrane with fabric reinforcement over joints, cracks, ninety-degree changes of elevation and transitions. Allow to dry.
- D. Membrane: Trowel or squeegee apply two coats of the primary membrane. Allow to dry between coats and before recoating.
- E. Texture Coats: Apply two cementitious texture coats to create the approved finish texture. Allow to dry between coats and before recoating.
- F. Apply two sealer coats in the selected color as recommended to produce a surface matching the submittal sample and project mock-up samples. Allow to dry between coats.

3.06 CURING, PROTECTION AND CLEANING

- A. Cure waterproof traffic deck system materials according to manufacturer's directions, taking care to prevent contamination during application stages and before completing curing process. Close application area for a minimum of 24 hours.

END OF SECTION

**SECTION 07 60 00
FLASHING AND SHEET METAL**

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Division 1 applies to this Section. Provide flashing and sheet metal items, complete.
- B. Work In This Section: Principal items include:
 - 1. Sheet metal flashings in connection with roofing.
 - 2. Reglet and counter-flashing assemblies.
 - 3. Miscellaneous metal flashing and counter-flashing as required, except where provided under mechanical and electrical sections.
 - 4. Coping caps.
 - 5. Downspouts.
 - 6. Scuppers.
 - 7. Gutters.
 - 8. Louvers with bird screens.
 - 9. Drip flashings.
 - 10. Shop priming and field touch-up.
 - 11. Caulking.
- C. Related Work Not In This Section:
 - 1. Sheet metal in connection with Plumbing, Air Conditioning, and Electrical.
 - 2. Metal accessories for drywall, lathing, and acoustical treatments.
 - 3. Prefabricated equipment curbs.
 - 4. Finish painting.
 - 5. Sleeves for embedded items.
 - 6. Metal decking.
 - 7. Roof scuttles and safety post.

1.02 QUALITY ASSURANCE

- A. Drawings and requirements specified govern. Conform to the current "Architectural Sheet Metal Manual" published by Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA), 1611 North Kent Street, Arlington, VA 22209 for conditions not indicated or specified and for general fabrication of sheet metal items.

1.03 SUBMITTALS

- A. Shop Drawings: Submit for fabricated sheet metal showing details, methods of joining, anchoring and fastening, thicknesses and gauges of metals, concealed reinforcement, expansion joint details, sections, and profiles.
- B. Samples: Submit (6) samples for each material or assembly requested.
- C. Product Data: Submit brochures of manufactured items.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Galvanized steel: ASTM A525, coating G90, mill phosphatized for paint adhesion, 22 gauge unless otherwise shown or specified.
- B. Solder: ASTM B32, B284.
- C. Solder flux: Standard brand non-corrosive acid-base type.
- D. Fasteners: Zinc or cadmium coated steel or stainless steel.
- E. Felt: ASTM D226, 15-pound type.
- F. Primer: Approved brand of zinc-dust zinc-oxide primer per Section 09900 with manufacturer's pretreatment materials.
- G. Sealant: Single component nonsag polyurethane, conforming to Section 07920.
- H. Building Paper: Fed. Spec. UU-B-790, Style 4, Grade B.

2.02 RELATED MATERIALS

- A. Reglets and Counterflashings: Fry Reglet Corp. flashing systems complete with unions and preformed corners of necessary types for particular locations, of 22 gauge galvanized steel, or approved equals by Metco Metal Products Co., Pacific Loxtite Flashing Co., National Cornice Works, Redco, Lane-Air, or equal. Use a single manufacturer's products, equivalent to Type MA at masonry, Type ST at plaster, or Type SM, as required by Drawings and details.
- B. Wall Louvers: Fabricated of aluminum alloy 6063-T5, frames of 0.125" thick, blades of 0.081 "thick. Blades shall be extruded into stormproof profile, riveted, and soldered. Blind reinforce frame corners and make watertight. Provide bird screens of 0.063" wire formed into 1/2" mesh and secured in 12 gauge extruded aluminum frame. Louvers shall have fluorocarbon paint finish specified in Section 05030. Louvers shall be Construction Specialties Model 6967, or equal by Aerolite.

2.03 GENERAL FABRICATION REQUIREMENTS

- A. Fabricate items to avoid distortion and overstressing of fastenings due to expansion and contraction. Provide expansion joints where necessary in continuous runs of sheet metal, constructed watertight and spaced 30-feet apart maximum. Lock and solder corners and blind hem exposed edges. Make joints with 4" lap and solder unless otherwise shown or specified. Fill single lock seams with sealant where soldering is infeasible. Run flanges 4" minimum onto roof and wall surfaces. Fabricate sheet metal items in nominal 8-foot lengths unless otherwise shown or specified.

- B. Soldering: All soldered joints shall be continuous. Do soldering slowly, immediately after application of flux, seams showing evenly flowed solder. Clean and neutralize finished soldering.
- C. Shop Priming: Clean completed items, apply pretreatment, and prime all exposed surfaces with specified primer. B. Shop Priming: Clean completed items, apply pretreatment, and prime all exposed surfaces with specified primer.

2.04 FABRICATED ITEMS

- A. Fabricated Items of 22 gauge galvanized steel unless otherwise indicated or specified.
- B. Counter-flashing: Except where indicated or specified otherwise, insert counter-flashing in reglets and extend down vertical surfaces over upturned vertical leg of base flashings not less than 3 inches. Fold the exposed edges of counterflashings 1/2 inch. Provide end laps in counterflashings not less than 3 inches and make weathertight with single component, not sag urethane sealant, as specified in Section 07920. Lengths of metal counterflashings shall not exceed 10 feet. Form the flashings to the required shapes before installation. Factory form the corners not less than 12 inches from the angle. Secure the flashings in the reglets with soft metal wedges (no lead) and space not more than 18 inches apart; short runs, place wedges closer together. Fill caulked-type reglets or raked joints which receive counter-flashing with caulking compound as covered in Section 07920. Turn up the concealed edge of counterflashings built into masonry or concrete walls not less than 1/4 inch and extend not less than 2 inches into the walls. Install counter-flashing to provide a spring action against base flashing.
- C. Coping Caps: Corner units having maximum 18" long legs and joints locked and soldered watertight, intermediate joints spaced at maximum 8-foot centers and equally spaced. Make intermediate joints of the flush butted type, edges spaced about 1/4" apart and centered over an 8" long backing plate of the same profile and gauge as the cap, set in a 1/2" wide bead of sealant. Secure both edges of caps with 1-1/2" wide 20 gauge galvanized steel cleats spaced at maximum 32" centers and locked into drip hem.
- D. Drip Flashings: Provide at heads of windows and doors. Use material compatible with window and frame materials. Coordinate installation of flashing with that of windows and doors. Provide hemmed exposed edges, 1-piece lengths.
- E. Scuppers: Line interior of scupper openings with sheet metal. Extend the lining through and project outside of the wall to form a drip on the bottom edge and form to return not less than one inch against the face of the outside wall at the top and sides. Fold outside edges under 1/2 inch on all sides. Provide the perimeter of the lining approximately 1/2 inch less than the perimeter of the scupper. Join the top and sides of the lining on the roof deck side to a closure flange by a locked and soldered joint. Join the bottom edge by a locked and soldered joint to the closure flange, where required form with a ridge to act as a gravel stop around the scupper inlet. Provide surfaces to receive the scupper lining and coat with bituminous plastic cement
- F. Gutters, Downspouts and Accessories: Fabricated from 16 oz copper by Old World Distributors (269) 353-0726. Types, shapes and sizes shall be as indicated on Drawings, complete, including downspout elbows and offsets. Provide downspouts in approximately 10-foot lengths. Provide end joints to telescope not less than 1/2 inch and lock longitudinal joints. Provide wire ball strainers for each gutter outlet. Provide strainers to fit tightly into outlets, of the same material used for gutters. Keep downspouts not less than one inch away from walls. Fasten

downspouts to the walls at top, bottom, and at intermediate points not to exceed 5 feet on centers with leader straps or concealed rack-and-pin type fasteners. Form straps and fasteners of metal compatible with the downspouts.

- G. Conductor Head: Of 20 gauge galvanized, top edge beaded for stiffening, outlet flange riveted and soldered. Provide a 1/4" mesh galvanized leaf strainer at top, secured in place but removable. Provide outlet tubes not less than 4 inches long. Seams shall be flat-lock solder type. Where conductor heads are used in conjunction with scuppers, set the conductor a minimum of 2 inches wider than the scupper. Attach conductor heads to the wall with suitable fasteners.

PART 3 – EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

- A. Install metal items as indicated, according to approved submittals, and as required to complete the entire work. Securely fasten and assemble, and make watertight and weathertight. Provide manufactured joints in copper gutters and solder in place.
- B. Coordination: Coordinate sheet metal items in connection with roofing for proper installation, and furnish in sufficient time to avoid delay in roofing construction. Install roofing sheet metal simultaneously with roofing.
- C. Caulking: Provide sealant caulking as indicated and required to seal and complete work of this section. Conform to Section 07920.
- D. Protection from Contact with Dissimilar Materials:
 - 1. Metal Surfaces: Paint surfaces in contact with mortar, concrete, or other masonry materials with alkali-resistant coatings such as heavy-bodied bituminous paint.
 - 2. Wood or Other Absorptive Materials: Paint surfaces that may become repeatedly wet and in contact with metal with two coats of aluminum paint or a coat of heavy-bodied bituminous paint.
- E. Expansion and Contraction: Provide expansion and contraction joints at not more than 30-foot intervals. Where the distance between the last expansion joint and the end of the continuous run is more than half the required interval, an additional joint shall be provided. Space joints evenly.

3.02 COMPLETION

- A. Examine installed sheet metal, water test if necessary or directed, and correct damaged or defective items.

END OF SECTION

SECTION 07 63 10
GUTTERS AND DOWNSPOUTS

PART 1 – GENERAL:

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.02 SECTION INCLUDES

- A. Precoated Galvanized steel gutters and downspouts.
- B. Precast concrete splash pads.

1.03 RELATED SECTIONS

- A. Section 07 62 00 - Sheet Metal Flashing and Trim.
- B. Section 09 90 00 - Painting: Field painting of metal surfaces.

1.04 REFERENCES

- A. ASTM A167 - Stainless and Heat-Resisting, Chromium-Nickel Steel Plate.
- B. ASTM A446 - Steel Sheet, Zinc Coated, (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.
- C. ASTM B32 - Solder Metal.
- D. ASTM B209 - Aluminum and Aluminum Alloy Sheet and Plate.
- E. ASTM B370 - Copper Sheet and Strip for Building Construction.
- F. ASTM B486 - Paste Solder.
- G. FS O-F-506 - Flux, Soldering, Paste and Liquid.
- H. FS TT-C-494 - Coating Compound, Bituminous, Solvent Type, Acid Resistant.
- I. SMACNA - Architectural Sheet Metal Manual.

1.05 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings: Indicate locations, configurations, jointing methods, fastening methods, locations, and installation details.
- C. Product Data: Provide data on prefabricated components.

- D. Samples: Submit two (2) samples, 12-inch long illustrating component design, finish, color, and configuration.

1.06 QUALITY ASSURANCE

- A. Conform to SMACNA Manual for sizing components for rainfall intensity determined by a storm occurrence of 1 in 10 years.
- B. Maintain one (1) copy of each document on site.

1.07 REGULATORY REQUIREMENTS

- A. Conform to applicable code for size and method of rain water discharge.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site to prevent damage.
- B. Stack preformed [and prefinished] material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope to drain.
- C. Prevent contact with materials during storage which may cause discoloration, staining, or damage.

1.09 COORDINATION

- A. Coordinate the work with downspout discharge pipe inlet.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Pre-Coated Galvanized Steel: ASTM A446, Grade A, G90 zinc coating; 20 gage core steel, shop pre-coated with modified silicone coating color selection by Architect.

2.02 COMPONENTS

- A. Gutters: SMACNA 5"x6" Rectangular profile.
- B. Downspouts: SMACNA Rectangular profile.
- C. Accessories: Profiled to suit gutters and downspouts.
- D. Splash Pads or Blocks: Precast concrete type, of size and profile indicated; minimum 3000 psi (21 Mpa) at 28 days, with minimum 5 percent air entrainment.

2.03 ACCESSORIES

- A. Anchorage Devices: SMACNA requirements.
- B. Gutter Supports: Brackets.
- C. Downspout Supports: Straps.

- D. Fasteners: Finish exposed fasteners same as flashing metal.
- E. Primer: Zinc chromate
- F. Protective Backing Paint: Zinc chromate alkyd.
- G. Solder: ASTM B32; 50/50 type.
- H. Flux: FS O-F-506

2.04 FABRICATION

- A. Form gutters and downspouts of profiles and size indicated.
- B. Fabricate with required connection pieces.
- C. Form sections square, true, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. [Allow for expansion at joints.]
- D. Hem exposed edges of metal.
- E. Fabricate gutter and downspout accessories; solder watertight.

2.05 FINISHES

- A. Prepare surfaces in accordance with Section 09 90 00.
- B. Apply bituminous protective backing on surfaces in contact with dissimilar materials.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work.

3.02 INSTALLATION

- A. Install gutters, downspouts, and accessories in accordance with SMACNA standards or manufacturer's instructions.
- B. Join lengths with seams soldered watertight. Flash and solder gutters to downspouts and accessories.
- C. Install gutters level with trim.
- D. Solder metal joints for full metal surface contact. After soldering, wash metal clean with neutralizing solution and rinse with water.
- E. Connect downspouts to storm sewer system. Seal connection watertight.

- F. Use Cast Iron pipe under walkways make transition to PVC as required.
- G. Set splash blocks under downspouts where indicated. See plans for locations.

END OF SECTION

**SECTION 07 92 00
JOINT SEALANTS**

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Silicone joint sealants.
 - 2. Urethane joint sealants.
 - 3. Latex joint sealants.
 - 4. Preformed joint sealants.

1.2 PRECONSTRUCTION TESTING

- A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers eight samples of materials that will contact or affect joint sealants. Use ASTM C 1087 or manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
- B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates. Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

1.3 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples: For each kind and color of joint sealant required.
- C. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.
- D. Product test reports.
- E. Preconstruction compatibility and adhesion test reports.
- F. Preconstruction field-adhesion test reports.
- G. Field-adhesion test reports.

- H. Warranties.

1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.
- B. Preinstallation Conference: Conduct conference at Project site.

1.5 WARRANTY

- A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. VOC Content of Interior Sealants: Provide sealants and sealant primers for use inside the weatherproofing system that comply with the following limits for VOC content when calculated according to 40 CFR 59, Part 59, Subpart D (EPA Method 24):
 - 1. Architectural Sealants: 250 g/L.
 - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 - 3. Sealant Primers for Porous Substrates: 775 g/L.
- B. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
 - 1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.
- C. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

2.2 SILICONE JOINT SEALANTS

- A. Neutral-Curing Silicone Joint Sealant: ASTM C 920.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. BASF Building Systems.
 - b. Dow Corning Corporation.
 - c. GE Advanced Materials - Silicones.
 - d. Pecora Corporation.
 - e. Polymeric Systems, Inc.
 - f. Schnee-Morehead, Inc.
 - g. Sika Corporation; Construction Products Division.
 - h. Tremco Incorporated.
- 2. Type: Single component (S) or multicomponent (M).
 - 3. Grade: Pourable (P) or nonsag (NS).
 - 4. Class: 100/50.
 - 5. Uses Related to Exposure: Traffic (T).

2.3 LATEX JOINT SEALANTS

- A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Building Systems.
 - b. Bostik, Inc.
 - c. Pecora Corporation.
 - d. Schnee-Morehead, Inc.
 - e. Tremco Incorporated.

2.4 JOINT SEALANT BACKING

- A. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

2.5 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.
 - 1. Remove laitance and form-release agents from concrete.
 - 2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.2 INSTALLATION

- A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.

2. Completely fill recesses in each joint configuration.
 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
- F. Acoustical Sealant Installation: Comply with ASTM C 919 and with manufacturer's written recommendations.
- G. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.3 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
1. Extent of Testing: Test completed and cured sealant joints as follows:
 - a. Perform 5 tests for the first 500 feet (300 m)] of joint length for each kind of sealant and joint substrate.
 - b. Perform 1 test for each 1000 feet (300 m) of joint length thereafter.
 2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
- B. Evaluation of Field-Adhesion Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.4 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.
1. Joint Locations:
 - a. Isolation and contraction joints in cast-in-place concrete slabs.
 - b. Tile control and expansion joints.
 - c. Joints between different materials listed above.

- d. Other joints as indicated.
- 2. Joint Sealant: Silicone.
- 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
 - 1. Joint Locations:
 - a. Construction joints in cast-in-place concrete.
 - b. Control and expansion joints in unit masonry.
 - c. Joints between different materials listed above.
 - d. Perimeter joints between materials listed above and frames of doors, windows and louvers.
 - e. Control and expansion joints in ceilings and other overhead surfaces.
 - f. Other joints as indicated.
 - 2. Joint Sealant: Silicone.
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
 - 1. Joint Locations:
 - a. Isolation joints in cast-in-place concrete slabs.
 - b. Control and expansion joints in tile flooring.
 - c. Other joints as indicated.
 - 2. Joint Sealant: Silicone.
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors
- D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.
 - 1. Joint Locations:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints of exterior openings where indicated.
 - c. Tile control and expansion joints.
 - d. Vertical joints on exposed surfaces of interior unit masonry, concrete, walls and partitions.
 - e. Perimeter joints between interior wall surfaces and frames of interior doors windows and elevator entrances.
 - f. Other joints as indicated.

2. Joint Sealant: Latex.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- E. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Sealant Location:
 - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - b. Tile control and expansion joints where indicated.
 - c. Other joints as indicated.
 2. Joint Sealant: Silicone.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION

SECTION 08 11 13
HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.01 WORK

- A. Custom fabricated hollow steel doors, door frames and glazed light frames with accessories and anchors complying with HMMA 861 "Guide Specifications for Commercial Hollow Metal Doors and Frames.

1.02 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including General and Supplementary conditions and Division 01 specification sections apply to this section.

1.03 RELATED WORK SECTIONS

- A. Section 08 71 00 Door Hardware
- B. Section 08 80 00 Glass and Glazing
- C. Section 09 90 00 Painting and Coating

1.04 REFERENCES SPECIFIED

- A. ISO 9001 – Quality System.
- B. UL 10B - Fire Tests of Door Assemblies.
- C. UL 10C – Standard for Positive Pressure Fire Tests of Door Assemblies, UBC 7-2-1997 Fire Tests of Door Assemblies.
- D. UL10B or NFPA 252 at Atmospheric Pressure.
- E. A1008/A1008M – Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Allow and High-Strength Low-Allow with Improved Formability.
- F. ASTM-A568 – General Requirements for Steel, Carbon and High Strength Low Alloy Hot Rolled Strip, and Cold Rolled Sheet.
- G. ASTM-A924 -General Requirements for Steel Sheet, Metallic Coated by the Hot-Dip Process.
- H. ANSI A250.8/SDI-100 - Recommended Specifications for Standard Steel Doors and Frames.
- I. ANSI A250.11 - Recommended Erection Instructions for Steel Frames.
- J. SDI-107 - Hardware on Steel Doors (Reinforcement Application).
- K. NFPA-80 - Standard for Fire Doors and Windows.

- L. NFPA-101 - Life Safety Code.
- M. ANSI-A250.4 and ANSI-A250.5 -Test Procedure and Acceptance Criteria for Physical Endurance, Steel Doors and Frames.
- N. ANSI-A250.10 - Test Procedure and Acceptance Criteria for Painted Steel Surfaces for Steel Doors and Frames.
- O. ADA-The Americans with Disabilities Act - Title III - Public Accommodations.
- P. ANSI-A117.1 - American National Standards Institute - Accessible and Usable Buildings and Facilities.
- Q. U. L. - Underwriter's Laboratories.
- R. ITS - Intertek Testing Service [Warnock Hersey].
- S. CBC - California Building Code and Local Codes Including Authority Having Jurisdiction.
- T. N.F.P.A. 105 - Smoke and draft control assemblies.
- U. U.L. - 1784 Air leakage test of door assemblies.
- V. 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.
- W (HMMA) Hollow Metal Mfr's. Assoc., a Div. of National Assoc. of Arch. Metal Mfr's. (NAAMM), Guide Spec. for Commercial Hollow Metal Doors & Frames, HMMA Standard #861-87; NFPA #80

1.05 SUBMITTALS

- A. Shop Drawings: Indicate door and frame elevations and sections, materials, gauges, fire ratings, finishes, fabrication and erection details, location and extent of hardware reinforcement, type and location of frame anchors, locations of finish hardware by dimension and locations/details of all openings and louvers. Do not proceed with any fabrication until all details are approved.
 - 1. Show all frame sections, anchorage of frames in openings, preparation for hardware, metal gauges, field splice joints, and other data.
 - 2. Doors: Show all construction; gauges, preparation for hardware, door lining materials, openings for louvers and glazing, and other data.
 - 3. Coordinate with Contractor and typically indicate acceptable tolerances to be incorporated into frame throat to allow for finish materials installation.
 - 4. Show elevations of each hollow metal door and window type, details of each frame type, location schedule using same reference numbers as contract drawings, details of installation in the various openings, wall thicknesses and materials to be encountered in this Project, installation requirements for hardware, and typical and

special details of construction, including relationships to adjacent construction and materials.

- B. Certification of Compliance: Submit any information necessary to indicate compliance to these specifications. Finished work and shop drawings shall match approved samples.
- C. Submit samples prior to submission of shop drawings or beginning any fabrication.
 - 1. Samples will be retained until Project is completed.
 - 2. Door Construction: Provide cut-away sample showing edge, top, and bottom construction; insulation; hinge, closer, lock, and panic bar reinforcement; face stiffening.
 - 3. Frame Construction: Provide sample of typical profile, with welded corner joint, hinge and closer reinforcement, mortar guards, wall anchor, and floor anchor, in full compliance with these Project specifications. For exterior openings to receive glazing, provide additional sample of typical profile with glazing stops and ALL joints/seams filled and sealed watertight.
- D. Job Closeout: Provide two (two) complete manufacturer's catalogs to the building owner's designated representative.

1.06 QUALITY ASSURANCE

- A. Source Quality Control: Products to be certified by manufacturer showing compliance with these specifications; specifically describe and certify complete hot-dipped galvanizing and shop prime painting of all hollow metal doors and frames at exterior openings. Certification must be submitted with shop drawings and with each product upon delivery. No doors or frames shall be delivered to job site, installed, or accepted without this certification.
- B. All hollow metal doors and frames shall be the product of one (1) manufacturer. Exceptions will not be permitted under any circumstances.
- C. Requirements of Regulatory Agencies: Conform to Title 24 CBC and NFPA #80 for fire-rated assemblies.
- D. Certification of label construction: For components exceeding Underwriters Laboratories, Inc. (UL)- furnish inspection certificate stating that component construction conforms to UL rating requirements only if architect is aware of such a limitation and has allowed the non-labeled unit.
- E. Certification of A-60 galvanizing and prime paint finishing.
- D. Certification that the Polystyrene Core Swinging Type Fire Doors – Model 707 as manufactured by The Curries Company, has been investigated by Underwriters Laboratories and certified for Standard(s) of Safety: UL 10C – Standard for Positive Pressure Fire Tests of Door Assemblies, UBC 7-2-1997, Fire Tests of Door Assemblies.
- E. Hollow metal manufacture shall be a SDI member.
- F. The Hollow Metal Manufacturer shall supply doors and frames through a national distribution system as described in 1.06.D herein. Marketing material through a factory direct method will not be acceptable to the building owner.

1. Successful distributor shall be located within the project area.
- G. Hollow metal supplier shall be a qualified "local direct distributor" of products to be furnished. The distributor shall have in their regular employment an AHC and/or CDC with a local business address, telephone and fax line, which will be available at reasonable time's through-out the project, to consult with the architect, contractor and building owner regarding matters affecting the door and frame openings.
- H. Contractor will allow in his bid for the replacement of two exterior (2) doors selected at random by the project architect and owner's representative for dismantling and inspection of internal construction and compliance with the specification. Contractor to provide labor and tools for inspection under architect's direction.
- I. Failure of any hollow metal frame or door to meet specified standards shall be grounds to reject the entire shipment of hollow metal doors and frames, including the hollow metal manufacturer. Components shall be replaced at contractor's expense, including two additional doors for dismantling. No extensions of time or additions to the contract will be allowed due to a rejection of material and substitution of the hollow metal manufacturer.
- J. Installer requirement: Firm with a minimum of five years experience in the installation of metal doors and frames similar in the type included in this specification and have a meeting with lock representative for proper installation of said locks.
- K. A pre-construction meeting is required for proper installation of said lock.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Deliver doors and frames cardboard wrapped, crated, palletized or otherwise protected during transit and site storage.
- B. Inspect doors and frames upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and accepted by the architect. Otherwise remove and replace damaged items.
- C. Store doors and frames at the building site in a dry, secure place.
 1. Place units on minimum 4-inch high wood blocking.
 2. Avoid non-vented shelters [covering] that can create a humidity chamber.
 3. If cardboard wrapper on door becomes wet, remove carton immediately.
 4. Provide 1/4-inch spaces between stacked doors to promote air circulation.

1.08 SEQUENCING AND SCHEDULING

- A. Sequencing, Scheduling: Verify all existing conditions, opening sizes, finishes, frame throat dimensions, existing conditions to remain, hardware, glazing, and doors with respective Sections.
- B. Deliver all doors and frames to the job site in a timely manner so as not to delay progress of other trades.

- C. Issue purchase orders to frame, door and hardware suppliers in sufficient time so as not to interfere with normal quoted delivery of materials.

1.09 WARRANTY

- A. Hollow metal doors and frames shall be supplied with a two (2) year warranty against defects in materials and workmanship.
- B. Warranty to commence with substantial completion of the job.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Or Equal, provided products meet the specified performance and construction requirements, and are acceptable to the building owner. Such products are subject to California Public Contracts Code Section 3400.
- B. Performance criteria as specified in 2.03 will be supported by an independent laboratory cycle and twist test certification document, and will be included in the supplier's shop submittals. The building owner's authorized representative including locksmith and project supervisor will review any proposed substitution. Request will be required ten (10) days before bid. Request will require a complete sample of product with supporting data. In addition, the architect and owner will be furnished a list of a minimum of twenty (20) local (75-mile radius of client) institutional end-user customers with facilities locksmith names and telephone numbers.
- C. Manufacturers:
 - A. Curries, Division of AADG, Inc.
 - B. Krieger
 - C. Stiles

2.02 MATERIALS

- A. Steel requirements, all doors and frames to be manufactured of commercial quality, stretcher leveled flatness, cold rolled steel per ASTM-A1008 and A-568 general requirements or galv. to A60 minimum coating weight standard per ASTM-A924 or A653 hot dip galvanized to A60 minimum coating weight standard. Internal reinforcing may be manufactured of hot rolled pickled and oiled steel per ASTM-A1011.
 - 1. Typical, For Frames at Interior Openings: ASTM A-366; Prime quality, cold rolled, pickled and annealed, free from scale pitting and surface defects.
 - 2. Typical, For Exterior Doors and Frames at Exterior Openings: ASTM A525 and ASTM A526; Prime quality, cold rolled, zinc coated (fully galvanized) by the hot dip process,
 - 3. Coating Materials Primer: all doors and frames to be bonderized and finished as standard with manufacturer's baked-on primer conforming to ANSI-A250.10, or galvanized conforming to Commercial Quality A-60 or G-90 (1.25 oz/sq. ft.), free from scale pitting and surface defects. Use stretcher leveled sheets for doors and panels.
- C. Door Core

1. Polystyrene core. All doors to have:
 - a. Fiberglass: Semi-rigid compressed fiberglass board, 6 pcf density, R = 4.55/inch.
 - b. Fire-Rated Doors: As required to provide required ratings.
 - c. Permanently bonded to the inside of each face sheet providing rigidity, insulating and sound deadening properties to the door.
 - d. Refer to 2.03 for additional specification.
 - e. Steel ribbed core doors are unacceptable and will be rejected and
 - f. replaced at the contractor's expense.
 2. Temperature rise rated doors should be provided for stairwell enclosures, which indicate "Temperature rise 30 minutes - 450 degrees F maximum or 250 degrees F maximum" as required by the local building code.
- D. Glass lite frames in doors fabricated of not less than 18 GA. galvanized steel with attachment screws allowed only on the non-secure side, screws not visible when viewing door lite frame face.
1. Metal Moldings/Frames and Stops For Glass Lites In Hollow Metal Doors: Provided by door mfr., fixed moldings integral with interior side of door; glass channels fully continuously welded watertight; loose stops min. 18 ga. for exterior side of door, tightly butted corner joints. At fire-rated doors, provide fire-rated stops.
 - a. Glazing Stops For Glass Lites & Porcelain Enamel Panels in Frames:
 - i. Typical: #20 ga., 5/8" deep typical; unless noted otherwise.
 - ii. All Exterior Stops: Galvanized A-60 or G-90.
 - iii. Stops For Fire-Rated Glass: #16 ga. min., 3/4" deep typical (5/8" min.); verify with glass mfr. for the particular fire rating.
- E. Security Metal Louvers For Hollow Metal Doors: "Anemostat" Type PLSL, fixed inverted split-Y, #18 ga. steel louvers, #12 ga. frame, #12 ga. security grille face plates with 13/16" sq. perforations, security thru-bolt fasteners, baked prime coat finish, with integral insect screen at exterior locations.
- F. Fastenings: As required; FHSM vandalproof / tamper-resistant screws for glazing stops. Use stainless steel type screws at exterior doors.
- G. Electric Through Wire [HMD]
1. Provide all hollow metal doors receiving electrified hardware with electrical through-door wiring harness and concealed plug connectors on each end to accommodate up to twelve wires.
 2. Coordinate connectors on each end of the wiring harness to plug directly into the electrified hardware and the electric hinge.

H. Electric Through Wire [HMF]

1. Provide all hollow metal frames receiving electrified hardware with Electrical wiring harness and concealed plug connectors to accommodate up to twelve wires.
2. Coordinate connectors on end of the wiring harness to plug directly into the electrified hardware and the electric hinge.

2.03 FABRICATION

A. General

1. Fabricate all doors and frames in accordance with ANSI A250.8-1998/SDI-100 except where requirements that are more stringent are specified.
2. As detailed on plans, fabricated "welded" frame units to be delivered to job site as single units. Transoms, sidelights, and window walls, which are "oversize" for transportation and installation, shall be furnished with field splices to be field assembled by the general contractor.
3. Supply only doors and frames manufactured by the acceptable manufacturer listed in this specification.
4. Doors to be 707 Series as manufactured by the Curries Co, Mason City, IA. 727 Series at Temperature rise rated doors, which indicate "Temperature rise 30 min.- 450F degrees maximum or 250F degrees maximum" as required by local building code.
5. Prepare doors to receive door hardware per approved schedule, including internal reinforcing. Do not include unnecessary cutouts in door faces not required by hardware template.

B. Door Construction

1. Classification: SDI Level 3 - Model 2 (16GA.) at all interior and exterior drs.
2. Face sheets formed of cold rolled steel.
3. Exterior doors to be galvanized to A60 minimum weight standard.
4. Seamless construction [Equal to Curries 707T] by continuous wire weld of both edges full height of door, and to be performed at the factory.
5. Lite and louver door cutouts: Furnish perimeter channel reinforcement and seal watertight by supplier.
6. Lock edges beveled 1/8 inch in 2 inches.
7. Door lock edge reinforcing shall be one-piece, full height 14GA. Channel. Door hinge edge reinforcing shall be one-piece, full height 12GA. Channel formed and tapped for hinges or as required per listed hardware.
8. Both hinge and lock channels to be welded to each face sheet of the door.
9. Top and bottom channels:

- a. Not less than 16GA. - flush or inverted.
 - b. Welded to the face sheet.
 - c. Close tops of exterior doors flush by the addition of 16GA. Galvanized steel channel fillers. Channel filler to sealed watertight.
- 10. Astragals: To be flat security type or 'Z' as called for in the specifications.
 - 11. All doors to conform to A.N.S.I.-A 250.4 Test Procedure and Acceptance Criteria for Physical Endurance. Door size cycle tested to be 4070 to min. Level A performance. Furthermore, doors will have been subjected to an additional one (1) million cycle and twist tests with a combined two (2) million cycles and 46 twist tests. Testing to be accomplished by an independent lab. Certification of these criteria to be submitted with approval drawing by the HM distributor.
 - 12. Transom Panels: To be constructed similar to doors.
 - 13. Where indicated, provide insert type louvers in bottom of doors. Louvers to be not less than 18 GA. prime coated steel.
 - 14. Minimum HG/FG stiles shall be six (6) inches wide. Top rail shall be a minimum eight (8) inches.

C. Door and Window Frame Construction

- 1. Frames shall comply with ANSI/SDI A250.5 Level A, one-million cycle swing test performance for a 4070 door frame.
- 2. All frames to be formed from cold rolled steel. Furnish 14GA. door and window frames at exterior openings and 16GA. at interior. Exterior door and window frames to be galvanized to A60 minimum weight standard.
- 3. All frames are to be Full Profile welded, ground smooth, and re-primed at the welded area.
- 4. Window frame glass stops shall be minimum 18GA. steel and 5/8" in height.
 - a. Exterior stops and countersunk flat-head attachment screws to be galvanized.
 - b. Typical, unless noted or detailed otherwise: Integral stop at interior face; loose (removable) stops at exterior face, for field assembly with countersunk removable vandalproof screws at 16" o.c. typical.
 - c. Removable Stops: #20 ga., 58" x 5/8" typical, unless noted otherwise. Finish to match steel frames, A-60 hot-dipped galvanize at all exterior openings.
 - d. All exposed screws to be non-magnetic stainless steel; finish to match steel frames.
- 5. Provide temporary shipping bars to help protect from damage during transit and handling.
 - a. Temporary shipping bars to be removed before setting frames.
- 6. All welds on frames, transoms and sidelites to be flush with neatly mitered or

butted material cuts.

- D. Frame Anchors: Provide sufficient anchorage to attach to wall in accordance with ANSI/SDI A250.5-'94 Test Compliance Level A of one million cycles, or anchorage as detailed on plans to specific wall conditions.
1. Wall anchor for frame attachment to masonry construction: Masonry anchors, adjustable, flat, corrugated or perforated 'T' shaped anchors with leg not less than 2 inches wide by 10 inches long or masonry "wire" type not less than 3/16" diameter.
 2. All frame jamb anchors to be provided: one each jamb per 24 inches of frame height or fraction thereof (minimum 3 in masonry or concrete and 4 in stud construction). Furnish a minimum of two head anchors for frames installed in stud walls and three or more anchors in frame width exceeding 42".
 3. Floor anchors - angle clip type:
 - a. Minimum 14 GA.
 - b. To receive two (2) fasteners per jamb.
 - c. Welded to the bottom of each jamb.
 4. In place masonry or concrete:
 - a. 3/8 inch countersunk flat head stove bolt and expansion shields.
 - b. Spaced 6 inches from top and bottom of frame and at 26 inches on center maximum between.
 - c. Weld pipe spacers or other type of spacers per manufacturer's standard design in back of frame soffit to protect frame profile during tightening of bolts and anchors.
 5. Head struts: for frames not anchored to masonry or concrete construction provide ceiling struts spot-welded to jambs each side extending to building structure where called for on schedule.
- E. Hardware Preparation [NOTE: Utility door prep is not acceptable]
1. Reinforcements: reinforce components for hardware installation in accord with ANSI-A115. Provide minimum gage hardware channel type reinforcing for mortise or surface applied hardware as follows:

Hinge	- 7 GA. on frames for mortise butt hinges (min 1-1/4"x10").
Cont Hinge	- 12 GA. full length on frames for continuous hinges.
Lock	- 12 GA. or equivalent number of threads.
Panic Devices	- 14 GA.
Surface Closer	- 12 GA.
Hold Open Arm	- 12 GA.
Other Items	- Conform to HMMA Standards

Field drilling and/or tapping for surface applied hardware is installation

contractor's responsibility.

2. Punch single leaf frames to receive three (3) silencers. Double leaf frames to receive two silencers per leaf at head.
3. Factory prepared hardware locations to be in accord with "Recommended Locations for Builders' Hardware for Standard Steel Doors and Frames", as adopted by The Steel Door Institute.
4. Grout solid all frames in masonry or concrete walls. Provide steel plaster-guards or mortar boxes, welded to frame, at back of hardware cutouts where installed in concrete, masonry or plaster openings. Protect inside throat of each frame in grout filled wall conditions or where antifreeze additives are used in fill, with a waterproof undercoating material minimum 1/8" thick, field applied by installer.

F. Drips:

1. Location: Provide at all locations where indicated and at all new or replacement exterior door frames where there is no above-the-door overhang which projects beyond a line drawn upward at 45 degrees from the door head.
2. Construction: 14 ga; Steel material same as door frame; tack weld to top of door frame embedded in wall; seal watertight; see Details.

G. Water Penetration: Borrowed lite assemblies, transom, sidelite, and combination transom sidelite frames are not factory sealed to prevent water penetration. In situations where water penetration is a concern, contractor must seal with a high quality long lasting sealant, all joints that are exposed to the elements after the frame assembly is installed. Whenever possible, it is recommended that glass and glazing be installed on the exterior rabbet of the frame assembly. This will help act as a deterrent to water penetration.

The member companies of the hollow metal industry cannot control the workmanship associated with the frame installation; therefore, it is the responsibility of the installer to assure all steps are taken to prevent water penetration.

H. Excess Material

1. Contractor to deliver any unused doors and frames to the building owner's designated representative.

PART 3 – EXECUTION

3.01 FRAME INSTALLATION

- A. Erection Installation: Install hollow metal units in accordance with manufacturer's instructions and final shop drawings. Fit doors to frames and floors with proper clearances and to achieve the maximum operational effectiveness and appearance of each unit. SDI 122-99 "Installation and Trouble Shooting Guide for Standard Steel Doors and Frames" or "The Installation of Commercial Steel Doors and Steel Frames" as published by DHI are recommended guidelines.
- B. Set welded frames in position prior to beginning partition work. Brace frames until permanent anchors are set.
- C. Set anchors for frames as work progresses. Install anchors at hinge and strike levels.
- D. Use temporary setting spreaders at all locations. Use intermediate spreaders to assure proper door clearances and header braces for grouted frames.

- E. Install frames in prepared openings in concrete and masonry walls using countersunk bolts and expansion anchors.
- F. Install all fire rated frames in accord with requirements of N.F.P.A.-80.
- G. Where frames require ceiling struts or other structural overhead bracing, they shall be anchored securely to structure above, as required.
- H. Frames shall be filled solid with Portland cement grout where shown or required by class of opening in masonry or concrete walls. Provide steel plaster guards or mortar boxes, welded to frame, at back of hardware cutouts where installed in concrete, masonry or plaster openings. Protect inside throat of each frame in grout filled wall conditions or where antifreeze additives are used in fill, with a waterproof undercoating type material minimum 1-2 mils thick and field applied by installer.

3.02 DOOR INSTALLATION

- A. Install hollow metal doors in frames using hardware specified in Section 08710 Finish Hardware. Doors are to be expertly hung and shall fit snug against all stops. Doors shall fit accurately and hang free from hinge bind with a uniform clearance of 1/8 inch at head and jambs. After hanging, make all adjustments and then remove respective hardware for finish painting. Reinstall hardware after finish painting.
- B. Maximum clearances at edge of doors:
 - 1. Between door and frame at head and jambs: 1/8 inch.
 - 2. At meeting edges pairs of doors and at mullions: 1/8 inch.
 - 3. At transom panels, without transom bars: 1/8 inch.
 - 4. At sills without thresholds: 5/8 inch max above finish floor.
 - 5. At sills with thresholds: 1/8 inch above threshold.
- C. Hardware Installation: to be installed securely without marking or defacing hardware or finish work. Protect finish hardware with suitable protective covering until completion of building. Hardware to be in perfect working order. Clean and polish.

3.03 ADJUSTMENT AND CLEANING

- A. Remove dirt and excess sealant, mortar or glazing compounds from exposed surfaces.
- B. Adjust for smooth operation as required. Install shims as required to allow for proper closing.
- C. Fill all dents, holes, etc. with metal filler and sand smooth and flush with adjacent surfaces - reprime/paint to match finish.

3.04 FINISH; FRAMES & DOORS

- A. Cleaning: After assembly, clean thoroughly, removing all rust, scale, grease, oil, rough spots. Use Hand Tool Cleaning (SSPC-SP2) or Power Tool Cleaning (SSPC-SP3) as applicable.
- B. Touch-Up Coating of Galvanized Work: After assembly, prior to prime painting, clean and coat all abraded or damaged galvanizing coating with cold galvanizing compound, 3 mils minimum thickness, per mfr's. requirements to achieve a finish equal to min. A-60 hot-dipped galvanizing.
- C. Prime Painting: After surfaces are clean, phosphatize and prime with one coat of specified rust inhibitive primer, baked on, 1.5 mils dry film thickness minimum.

- D. At All Frames To Be Solid Grouted: Coat inside of frame profile with bituminous coating to a thickness of 1/16 inch.

3.05 ADJUSTMENT

- A. Straighten, repair, and/or replace damaged work.
- B. Repair any damaged or abraded areas of prime coat.
- C. Repair any sealant leaks watertight.

END OF SECTION

**SECTION 08 33 00
ROLLUP SERVICE DOOR**

PART 1 – GENERAL

1.1 SUMMARY

- A. **Section Includes:** Electric operated overhead insulated rolling doors
- B. **Related Sections:**
 - 1. 05 50 00 Metal Fabrications. Door opening jamb and head members.
 - 2. 06 10 00 Rough Carpentry. Door opening jamb and head members.
 - 3. Division 26. Electrical wiring and conduit, fuses, disconnect switches, connection of operator to power supply, and installation of control station and wiring.
- C. **Products That May Be Supplied, But Are Not Installed Under This Section:**
 - 1. Control Station

1.2 SYSTEM DESCRIPTION

- A. **Design Requirements:**
 - 1. **Cycle Life:**
 - a. Design doors of standard construction for normal use of up to 20 cycles per day maximum, and an overall maximum of 50,000 operating cycles for the life of the door
 - 2. **Insulated Door Slat Material Requirements:**
 - a. Flame Spread Index of 0 and a Smoke Developed Index of 10 as tested per ASTM E84
 - b. Minimum R-value of 8.0 (U-value of 0.125) as calculated using the ASHRAE Handbook of Fundamentals
 - c. Insulation to be CFC Free with an Ozone Depletion Potential (ODP) rating of zero

1.3 SUBMITTALS

- A. Reference Section 01 33 00 Submittal Procedures; submit the following items:
 - 1. **Product Data**
 - 2. **Shop Drawings:** Include special conditions not detailed in Product Data. Show interface with adjacent work.
 - 3. **Quality Assurance/Control Submittals:**
 - a. Provide manufacturer ISO 9001:2015 registration
 - b. Provide manufacturer and installer qualifications - see below
 - c. Provide manufacturer's installation instructions
 - 4. **Closeout Submittals:**
 - a. Operation and Maintenance Manual
 - b. Certificate stating that installed materials comply with this specification

1.4 QUALITY ASSURANCE

- A. **Qualifications:**
 - 1. **Manufacturer Qualifications:** ISO 9001:2015 registered and a minimum of five years experience in producing doors of the type specified
 - 2. **Installer Qualifications:** Manufacturer's approval

1.5 DELIVERY STORAGE AND HANDLING

- A. Reference Section 01 66 00 Product Storage and Handling Requirements
- B. Follow manufacturer's instructions

1.6 WARRANTY

- A. Standard Warranty: Two years from date of shipment against defects in material and workmanship.
- B. Maintenance: Submit for owner's consideration and acceptance of a maintenance service agreement for installed products

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. **Manufacturer:**
Cornell: 24 Elmwood Avenue, Mountain Top, PA 18707. Telephone: (800) 233-8366
- B. Alternates:
 - 1. Cookson
 - 2. Clopay

2.2 PRODUCT INFORMATION

- A. **Model:** ESD20

2.3 MATERIALS

- A. **Curtain:**
 - 1. **Fabrication:**
 - a. **Slat Material:** No. 6F, (Listed Exterior/Interior):
 - 1) **Galvanized Steel/Galvanized Steel:** Manufacturer recommended gauge based on performance requirements. Minimum 22/22 gauge, Grade 40, ASTM A 653 galvanized steel zinc coating.
 - b. **Insulation:** 7/8 inch foamed-in-place, closed cell urethane
 - c. **Total Slat Thickness:** 15/16 inch
 - d. **Flame Spread Index** of 0 and a **Smoke Developed Index** of 10 as tested per ASTM E84
 - e. **R-value:** 8.0
 - 2. **Slat Finish:**
 - a. **SpectraShield® Coating System:**
 - 1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding, gray baked-on base coat and gray baked-on polyester finish coat
 - 2) Zirconium treatment followed by baked-on polyester powder coat, with color as selected by Architect from manufacturer's standard color range, over 180 colors; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better
 - 3) **SpectraShield Ultra** – Ultra Powder Coat to be applied as a protective top coat over SpectraShield finish. Top coat is a polyester based structured wear resistant clear powder coat of 2.5-3.5 mils cured film thickness. ASTM D-3363 pencil hardness: 2H or better. Tested per ASTM B117
- B. **Endlocks:** Fabricate interlocking sections with high strength nylon endlocks on alternate slats each secured with two 1/4" rivets.

- C. **Bottom Bar**
1. **Insulated Bottom Bar:** Reinforced extruded aluminum interior face with full depth insulation and exterior skin slat to match curtain material and gauge. Minimum 4" tall x 1-1/16" thickness.
 2. **Finish:**
 - a. Powder coat to match slats
- D. **Guides:**
1. **Fabrication:**
 - a. Minimum 3/16 inch structural steel angles. Provide windlock bars of same material when windlocks are required to meet specified wind load. Top of inner and outer guide angles to be flared outwards to form bellmouth for smooth entry of curtain into guides. Provide removable guide stoppers to prevent over travel of curtain and bottom bar.
 2. **Finish:**
 - a. **SpectraShield® Coating System:** Zirconium treatment followed by baked-on polyester powder coat, color as selected by Architect from manufacturer's standard color range, over 180 colors; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better
- E. **Counterbalance Shaft Assembly:**
1. **Barrel:** Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot of width
 2. **Spring Balance:** Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door to ensure that maximum effort to operate will not exceed 25 lbs. Provide wheel for applying and adjusting spring torque.
- F. **Brackets:**
Fabricate from minimum 3/16 inch steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures
1. **Finish:**
 - a. **SpectraShield® Coating System:** Zirconium treatment followed by baked-on polyester powder coat, color as selected by Architect from manufacturer's standard color range, over 180 colors; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better
- G. **Hood:**
Minimum 24 gauge galvanized steel with reinforced top and bottom edges. Provide minimum 1/4 inch steel intermediate support brackets as required to prevent excessive sag.
1. **Finish:**
 - a. **SpectraShield® Coating System:**
 - 1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding, gray baked-on base coat and gray baked-on polyester finish coat
 - 2) Zirconium treatment followed by baked-on polyester powder coat, with color as selected by Architect from manufacturer's standard color range, over 180 colors; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better
- H. **Weatherstripping:**
1. **Bottom Bar:** Sensing/weather edge with neoprene astragal extending full width of door bottom bar

2. **Guides:** Replaceable vinyl strip on guides sealing against fascia side of curtain
3. **Lintel Seal:** Nylon brush seal fitted at door header to impede air flow

2.4 OPERATION

- A. **Motor – Standard Use – Model MG (Industrial Duty Gear Head) Operator:** The operator must not extend above or below the door coil when mounted front-of-coil. Rated for a maximum of 20 cycles per hour (not to be used for consecutive hours) cULus listed (to comply with UL requirements in The United States and Canada), Totally Enclosed Non Ventilated gear head operators rated 1/2 hp as recommended by door manufacture for size and type of door, 120 Volts, 1 Phase. Provide complete with electric motor and factory pre-wired motor control terminals, maintenance free solenoid actuated brake and control station. Motor shall be high starting torque, industrial type, protected against overload with an auto-reset thermal sensing device. Primary speed reduction shall be heavy-duty, lubricated gears with mechanical braking to hold the door in any position. Operator shall be equipped with an emergency manual chain hoist assembly that safely cuts operator power when engaged. A disconnect chain shall not be required to engage or release the manual chain hoist. Operator drive and door driven sprockets shall be provided with #50 roller chain. Operator drive and door driven sprockets shall be provided with minimum #50 roller chain. Operator shall be capable of driving the door at a speed of up to 9" per second or as recommended for door size. Fully adjustable, driven linear screw type cam limit switch mechanism shall synchronize the operator with the door. The electrical contractor shall mount the control station and supply the appropriate disconnect switch, all conduit and wiring per the overhead door wiring instructions.
- B. **Control Station:**
 1. **Surface mounted:** "Open/Close/Stop" push buttons; NEMA 1
- C. **Control Operation:**
 1. **Momentary Contact to Close:**
Fail-safe, UL325-2010 Compliant Entrapment Protection for Motor Operation.
 - a. **SafetyGard UL325 Light Curtain with Dynamic Sequential Blanking:**
Provide monitored, non-contact light curtain consisting of a transmitter and a receiver to be mounted to the guide assembly of the door in the provided mounting channel, projecting a thru beam across the width of the door for the height of the light curtain (3ft or 6ft depending on opening size of the door). Interruption of beam before door fully closes shall cause door to immediately stop downward travel and reverse direction to the fully opened position
 - b. **Continuously monitored, wireless sensing/weather edge** seal extending full width of door bottom bar. Contact before door fully closes shall cause door to immediately stop downward travel and reverse direction to the fully opened position.

2.5 ACCESSORIES

- A. **Covers:**
 1. **Operator and Bracket Mechanism Cover:** Minimum 24 gauge galvanized steel sheet metal cover to enclose exposed moving operating components at coil area of unit. Finish to match door hood.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings
- B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates
- C. Commencement of work by installer is acceptance of substrate

3.2 INSTALLATION

- A. General: Install door and operating equipment with necessary hardware, anchors, inserts, hangers and supports
- B. Follow manufacturer's installation instructions

3.3 ADJUSTING

- A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion

3.4 CLEANING

- A. Clean surfaces soiled by work as recommended by manufacturer
- B. Remove surplus materials and debris from the site

3.5 DEMONSTRATION

- A. Demonstrate proper operation to Owner's Representative
- B. Instruct Owner's Representative in maintenance procedures

END OF SECTION

**SECTION 08 71 00
DOOR HARDWARE**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes commercial door hardware for the following:
 - 1. Swinging doors.
 - 2. Sliding doors.
 - 3. Other doors to the extent indicated.
- B. Door hardware includes, but is not necessarily limited to, the following:
 - 1. Mechanical door hardware.
 - 2. Electromechanical door hardware.
 - 3. Cylinders specified for doors in other sections.
- C. Related Sections:
 - 1. Division 08 Section "Hollow Metal Doors and Frames".
 - 2. Division 08 Section "Glazing".
 - 3. Division 08 Section "Overhead Coiling Doors".
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ICC/IBC - International Building Code.
 - 3. NFPA 70 - National Electrical Code.
 - 4. NFPA 80 - Fire Doors and Windows.
 - 5. NFPA 101 - Life Safety Code.
 - 6. NFPA 105 - Installation of Smoke Door Assemblies.
 - 7. State Building Codes, Local Amendments.
- E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:
 - 1. ANSI/BHMA Certified Product Standards - A156 Series.
 - 2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
 - 3. ANSI/UL 294 - Access Control System Units.
 - 4. UL 305 - Panic Hardware.
 - 5. ANSI/UL 437- Key Locks.

1.03 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. Proof of Compliance: (California located Projects): Provide a list of product(s) containing chemicals known to cause cancer or reproductive toxicity as defined by the Office of Environmental Health Hazard Assessment (OEHHA) under Proposition 65 (CA Code of Regulations, Title 27, Section 27001). The list includes the specific chemical(s), if the chemical will be exposed to consumers, the means of warning, and an illustration of the label.

- F. 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.
- G. 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 Procedures.

1.04 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. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).
- C. 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.
- D. 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.
- E. 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.
- F. California Building Code: Provide hardware that complies with CBC Section 11B.
 - 1. All openings as a part of an accessible route shall comply with CBC Section 11B-404.
 - 2. The clear opening width for a door shall be 32" minimum. For a swinging door it shall be measured between the face of the door and the stop, with the door open 90 degrees. There shall be no projections into it below 34" and 4" maximum projections into it between 34" and 80" above the finish floor or ground. Door closers and stops shall be permitted to be 78" minimum above the finish floor or ground. CBC Section 11B-404.2.3.
 - 3. Operable hardware on accessible doors shall comply with CBC Section 11B-309.4 and shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. Operable parts of such hardware shall be 34" minimum and 44" maximum above finish floor or ground. Where sliding doors are in the fully open position, operating hardware shall be exposed and usable from both sides.

4. Hardware (including panic hardware) shall not be provided with "nightlatch" function for any accessible doors or gates unless the following conditions are met:
 - a. Such hardware has a 'dogging' feature and is dogged during the time the facility is open.
 - b. All 'dogging' operation is performed only by employees as their job function (non-public use).
5. The force for pushing or pulling open a door shall be in accordance with CBC Section 11B-404.2.9.
 - a. Interior hinged doors, sliding or folding doors, and exterior hinged doors: 5 pounds (22.2 N) maximum. Required fire doors: the minimum opening force allowable by the DSA authority, not to exceed 15 pounds (66.7N). These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position.
 - b. The force required for activating any operable parts, such as lever hardware, or disengaging other devices shall be 5 pounds (22.2N) maximum to comply with CBC Section 11B-309.4.
 - c. The 5 pound (22.2 N) maximum force shall be validated for the size of the door used. The Building Materials Listing of the California State Fire Marshal shall indicate that the door hardware meets the 5 pound (22.2 N) force and shall also list the largest door that can be used.
6. Door closing speed shall comply with CBC Section 11B-404.2.8. Closers shall be adjusted so that the required time to move a door from an open position of 90 degrees to a position of 12 degrees from the latch is 5 seconds minimum. Spring hinges shall be adjusted so that the required time to move a door from an open position of 70 degrees to the closed position is 1.5 seconds minimum.
7. Floor stops shall not be located in the path of travel and 4" maximum from walls.
8. Thresholds shall comply with CBC Section 11B-404.2.5.
- G. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
- H. 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.
- I. 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
- J. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.05 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".

1.06 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 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.

1.07 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 overhead door closer bodies.
 - 4. Five years for motorized electric latch retraction exit devices.
 - 5. Two years for electromechanical door hardware, unless noted otherwise.

1.08 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: With the exception of electric through wire hinges, 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. Bommer Industries (BO).
 - b. McKinney (MK).
- B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge. with minimum 0.120-inch thick extruded 6063-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. Bommer Industries (BO).
 - b. Pemko (PE).
- C. Pin and Barrel Continuous Hinges: ANSI/BHMA A156.26 Grade 1-600 certified pin and barrel continuous hinges with minimum 14 gauge Type 304 stainless steel hinge leaves, concealed stainless pin, and twin self-lubricated nylon bearings at each knuckle separation. Factory trim hinges to suit door height and prepare for electrical cut-outs.
 - 1. Manufacturers:
 - a. Markar Products; ASSA ABLOY Architectural Door Accessories (MR).
 - b. Pemko (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. Pemko (PE) - EL-CEPT Series.
 - b. Securitron (SU) - EL-CEPT Series.
 - c. Von Duprin (VD) - EPT-10 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 (MK) - Electrical Connecting Kit: QC-R001.
- b. McKinney (MK) - Connector Hand Tool: QC-R003.

2. Manufacturers:

- a. Hager Companies (HA) - Quick Connect.
- b. McKinney (MK) - QC-C Series.
- c. Stanley Hardware (ST) - WH 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. Door Controls International (DC).
- b. Rockwood (RO).
- c. Trimco (TC).

B. Coordinators: ANSI/BHMA A156.3 certified door coordinators consisting of active-leaf, hold-open lever and inactive-leaf release trigger. Model as indicated in hardware sets.

1. Manufacturers:

- a. Door Controls International (DC).
- b. Rockwood (RO).
- c. Trimco (TC).

C. 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. Hiawatha, Inc. (HI).
- b. Rockwood (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.
- C. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:
 - 1. Threaded mortise cylinders with rings and cams to suit hardware application.
 - 2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 - 3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
 - 4. Tubular deadlocks and other auxiliary locks.
 - 5. 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.
 - 6. Keyway: Manufacturer's Standard.
- D. Keying System: Each type of lock and cylinders to be factory keyed.
 - 1. Supplier shall conduct a "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: Field verify and key cylinders to match 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 KEY CONTROL

- A. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.
 - 1. Manufacturers:
 - a. Lund Equipment (LU).
 - b. MMF Industries (MM).
 - c. Telkee (TK).

2.07 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.
 - 1. Manufacturers:
 - a. Corbin Russwin Hardware (RU) - ML2000 Series.
 - b. Sargent Manufacturing (SA) - 8200 Series.

2.08 ELECTROMECHANICAL LOCKING DEVICES

- A. Electromechanical Multi-Point Locks: Vertical rod locking devices designed for openings requiring multiple latching points within one locking mechanism. Rods are retracted by dual mounted outside lever trim controls available in a variety of ANSI/BHMA operational functions. Option for single top latching only eliminates the need for bottom strikes. Electromechanical options include solenoid activated trim, electric latch retraction, and inside and outside lever monitoring.
 - 1. Energy Efficient Design: Provide lock bodies which have a holding current draw of 15mA maximum, and can operate on either 12 or 24 volts. Locks are to be field configurable for fail safe or fail secure operation.
 - 2. Manufacturers:
 - a. Corbin Russwin Hardware (RU) MP9800 Series.
 - b. Sargent Manufacturing (SA) - 7000 Series.

2.09 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.

2.10 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. 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.
 6. 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.
 7. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
 8. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
 9. Rail Sizing: Provide exit device rails factory sized for proper door width application.
 10. 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 Products Directory (CPD) listed 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. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
 - b. Sargent Manufacturing (SA) - 80 Series.

2.11 ELECTROMECHANICAL EXIT DEVICES

- A. Electromechanical Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices subject to same compliance standards and requirements as mechanical exit devices. Electrified exit devices to be of type and design as specified below and in the hardware sets.
1. Energy Efficient Design: Provide devices which have a holding current draw of 15mA maximum, and can operate on either 12 or 24 volts. Locks are to be field configurable for fail safe or fail secure operation.
 2. Where conventional power supplies are not sufficient, include any specific controllers required to provide the proper inrush current.
 3. Motorized Electric Latch Retraction: Devices with an electric latch retraction feature must use motors which have a maximum current draw of 600mA. Solenoid driven latch retraction is not acceptable.
 4. Manufacturers:
 - a. Corbin Russwin Hardware (RU) - ED5000 Series.
 - b. Sargent Manufacturing (SA) - 80 Series.

2.12 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.
 - 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. 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 Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
 - 4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
 - 5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
 - 6. 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 (Heavy Duty): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed 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 or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.
 - 1. Manufacturers:
 - a. Corbin Russwin Hardware (RU) - DC6000 Series.
 - b. Norton Rixson (NO) - 7500 Series.
 - c. Sargent Manufacturing (SA) - 351 Series.

2.13 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. Norton Rixson (RF) - 980/990 Series.
 - b. Sargent Manufacturing (SA) - 1560 Series.

2.14 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. Hiawatha, Inc. (HI).
 - b. Rockwood (RO).

2.15 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. Hiawatha, Inc. (HI).
 - b. Rockwood (RO).
- C. Overhead Door Stops and Holders: ANSI/BHMA A156.8, Grade 1 Certified Products Directory (CPD) listed 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. Norton Rixson (RF).
 - b. Rockwood (RO).
 - c. Sargent Manufacturing (SA).

2.16 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 (PE).
 - 2. Reese Enterprises, Inc. (RE).

2.17 ELECTRONIC ACCESSORIES

- A. Switching Power Supplies: Provide power supplies with either single or dual voltage configurations at 12 or 24VDC. Power supplies shall have battery backup function with an integrated battery charging circuit and shall provide capability for power distribution, direct lock control and Fire Alarm Interface (FAI) through add on modules. Power supplies shall be expandable up to 16 individually protected outputs. Output modules shall provide individually protected, continuous outputs and/or individually protected, relay controlled outputs.
 - 1. 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.
 - 2. Manufacturers:
 - a. Securitron (SU) - AQD Series.
- B. Intelligent Switching Power Supplies: Provide power supplies with single, dual or multi-voltage configurations at 12 and/or 24VDC. Power Supply shall have battery backup function with an integrated battery charging circuit. The power supply shall have a standard, integrated Fire Alarm Interface (FAI). The power supply shall provide capability for secondary voltage, power distribution, direct lock control and network monitoring through add on modules. The power supply shall be expandable up to 16 individually protected outputs. Output modules shall provide individually protected, continuous outputs and/or individually protected, relay controlled outputs. Network modules shall provide remote monitoring functions such as status reporting, fault reporting and information logging.
 - 1. 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.
 - 2. Manufacturers:
 - a. Securitron (SU) - AQL Series.

2.18 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.

2.19 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

PRODUCT DATA SHEET 1 - other conditions affecting performance.

- A. 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. DHI TDH-007-20: Installation Guide for Doors and Hardware.
 - 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 (Punch Report): Reference Division 01 Sections "Closeout Procedures". Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted.

PRODUCT DATA SHEET 2 - Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

- 1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

3.02 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.

3.03 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.

3.04 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.05 DOOR HARDWARE SETS

- A. The hardware sets represent the design intent and direction of the owner and architect and are based on Floor plans and Door schedule dated 04/29/2022. 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.
1. Quantities listed are for each pair of doors, or for each single door.
 2. The supplier is responsible for handing and sizing all products.
 3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
 4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

Hardware Sets

Set: 1.0

Doors: 009C

Description: STORAGE

1 Continuous Hinge	FM300 WEP	630	MR
1 Rim Exit Device, Storeroom	43 5CH 8804 Less Pull x 525	US32D	SA
1 Rim Cylinder	Match Facility Standard	626	
1 Vandal Resistant Trim	VRT26 C	US32D	RO
1 Surface Closer	351 P10	EN	SA
1 Kick Plate	K1050 10" high CSK BEV	US32D	RO
1 Door Stop	466-RKW	Black	RO
1 Threshold	158A or per Sill Detail		PE
1 Gasketing (Head)	2891AS		PE
2 Gasketing (Jambs)	290AS		PE
1 Rain Guard	346C (Omit @ overhang)		PE
1 Sweep	315CN		PE

END OF SECTION

**SECTION 08 80 00
GLAZING**

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.02 SUMMARY

- B. Principal Work in this Section:

- 1. All glass and glazing for the Project except as noted below.
- 2. Glazing accessories.
- 3. Glazing sealants.

- C. Related Work:

- 1. Section 08 88 13 - Fire-Resistant Glazing

1.03 SUBMITTALS

- A. Procedure: In compliance with Section 01 30 00.
- B. Samples: 12 in. square labeled samples of each type and color of glass, except heat treated, with taped or ground edges.
- C. Certification: Glass manufacturer's certification as specified.

1.04 QUALITY ASSURANCE

- A. Manufacturer's Certification: Submit manufacturer's certification that all materials to be used in the glazing system such as sealants, setting blocks, spacers, backing rods, metal finishes, etc. have been reviewed by the glass manufacturer, and are compatible with the glass supplied to the Project site, and will not cause deterioration, premature aging, and staining of adjacent materials.
- B. Labeling:
 - 1. Submit a certificate stating that the glass furnished for the Project complies with the Specifications.
 - 2. Label each piece of heat-treated glass with a permanent logo etched in one corner to identify the fabricator.

1.05 PERFORMANCE REQUIREMENTS FOR GLASS

- A. Insulating glass shall not experience fogging, wetting or staining within the sealed space, nor spacer corrosion, spacer migration, adhesive or cohesive failure of primary or secondary edge seal. Insulating glass shall not experience decrease in the air space dimension due to chemical reaction of desiccant with entrapped gas. Insulated glass units shall have a classification of Class CBA per ASTM E 774.

- B. Glass shall not experience spontaneous breakage.
- C. Glass center deflection relative to glass edges at 50% of design pressures shall not exceed 1 in. Glass deflection at 150% of design pressures shall be limited to prevent disengagement from frame.
 - 1. For insulating glass edge construction, it shall be assumed that the entire outward design pressure is supported solely by the outdoor glass.
- D. Examine heat-strengthened and tempered glass and discard any lights which exceed the following tolerances:
 - 1/16 in. bow in 2 ft.
 - 1/8 in. bow in 5 ft.
 - 1/4 in. bow in 10 ft.
 - 3/8 in. bow in 15 ft.
 - 1. Where the strengthening process results in essentially parallel ripples or waves, the deviation from flatness at any peak shall not exceed 0.0005 in., and the difference between adjacent peaks shall not exceed 0.003 in.
 - 2. Where bow tolerance and wave tolerance differ, the stricter requirement shall govern.
 - 3. Direction of ripples shall be consistent.
- E. Glazing materials shall be qualified by tests in accordance with UBC Standard 7-2 (for fire doors) or UBC Standard 7-4 (for fire windows) as appropriate for the use, and they shall be labeled for the required fire-protection rating and installed in accordance with their listing. Glazing in fire door assemblies and in fire window assemblies subject to human impact in hazardous locations as indicated in CBC Section 2406.4 shall comply with CBC Section 2406.3.

1.06 HANDLING

- A. Procedure: In accordance with Section 01 65 00.
- B. Precautions: Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, run-off, and other causes.

1.07 PROJECT CONDITIONS

- A. Do not proceed with installation of bulk sealants under adverse weather conditions, or when temperatures are below or above manufacturer's recommended limitations for installation.

1.08 WARRANTY

- A. Warrant insulating glass against fogging, loss of transparency and frost build-up between the glass panes due to defective materials or sealant failure for 5 years after Substantial Completion.
- B. Warrant coating on spandrel glass against cracking, peeling, wrinkling, color fading, blistering, flaking, delaminating, staining and discoloration for 5 years after Substantial Completion.

- C. Glass shall not experience spontaneous breakage.
 - 1. This Specification defines nickel sulfide stones as a glass material defect.
 - 2. Installed tempered glass which breaks due to nickel sulfide stones shall be included in the warranty.
- D. Replace defective materials and workmanship during the warranty period at not cost to the District.

PART 2 – PRODUCTS

2.01 GLASS

- A. General:
 - 1. Float glass shall comply with ASTM C 1036; heat-treated glass shall comply with ASTM A 1048.
 - 2. All tinted glass shall be made by the same manufacturer.
 - 3. Tempered glass shall be tempered horizontally; mark glass as specified above identifying it as tempered glass.
 - 4. Unless otherwise indicated or specified, overall thickness of each glass type shall be consistent throughout the Project.
- B. Insulating Glass Units:
 - 1. Provide insulating glass assemblies CBA rated by IGCC when tested in compliance with ASTM E 774, and permanently labeled with the appropriate certification label of IGCC, ALI or NCTL.
 - 2. Sealing System: Dual seal, primary and secondary sealants shall be manufacturer's standard sealants.
 - 3. Spacers: Aluminum with clear anodized finish.
 - 4. Desiccant: Either molecular sieve or silica gel or blend of both.
 - 5. Corner Construction: Manufacturer's standard corner construction.
- C. Glass Types:
 - 1. Type A: Clear, 1/4 in. thick, tempered, float glass.
 - 2. Type B: 1 in. thick insulated assembly consisting of 1/4 in. thick, tempered clear Solarban 60 solar control Low-E glass by PPG, 1/2 in. argon gas space, and Type A glass for the interior lite. Glass shall provide a visible light transmittance of 70 percent and a shading coefficient of .44.

2.02 MISCELLANEOUS GLAZING MATERIALS

- A. Setting Block: Neoprene, silicone, or EPDM, 80 – 90 durometer hardness, compatible with sealants used, 6 in. long minimum.

- B. Spacer: Neoprene, silicone, or EPDM, 50 – 60 durometer hardness, compatible with sealants used.
- C. Sealants:
 - 1. For all conditions, except primary seal of insulating units: General Electric Silglaze, or Dow Corning 795 or 999.
 - 2. For Primary Seal of Insulating Units: Manufacturer's standard sealant.
- D. Glazing Gaskets: Molded resilient continuous neoprene, silicone, or EPDM extrusions, 40 to 60 Shore A durometer hardness, meeting the requirements of ASTM C 509 for cellular (closed-cell) material, and AAMA SG-1 for non-cellular (dense) material.
- E. Compressible Filler Rod:
 - 1. Closed-dell or waterproof jacketed rod stock of synthetic rubber or plastic foam compatible with sealants used, flexible and resilient, with 5 to 10 psi compressive strength at 25% deflection.
 - 2. Do not use vinyl foam stock.
- F. Cleaner, Primer and Sealer: Type recommended by sealant or gasket manufacturer.

2.03 FABRICATION

- A. Cutting:
 - 1. Obtain sizes from shop drawings or by field measurement. Cut glass to fit each opening with at least the minimum edge clearance and bite on glass recommended by glass manufacturer.
 - 2. When glass will be precut to sizes obtained from shop drawings, take field measurements of each opening before glazing to verify adequate bite on glass and minimum edge clearance. Glaze openings which do not fall within tolerances for which precut glass has been sized only with glass specially cut to fit such openings.
 - 3. Do not nip glass edges. Edges may be wheel cut or sawed and seamed at manufacturer's option.
 - 4. For glass to be cut at site, provide glass 2 in. larger than required, in both dimensions, to facilitate cutting of clean-cut edges without seaming or nipping.
 - 5. Do not cut, seam, nip, or abrade tempered glass after tempering.
 - 6. Provide flat ground edges with arrised corners where glass edge is not covered by a metal stop.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Verify conditions and measurements affecting the work of this Section at site.

- B. Make sure that openings and frames to be glazed are within allowable tolerances, plumb, level and square. Inspect framing joint intersections to insure that the offset in the joinery will not impose undue edge pressure on the glass in compliance with FGMA, Glazing Manual, and Sealant Manual, guidelines.
- C. Verify that other detrimental conditions are corrected before proceeding with installation.

3.02 STANDARDS AND PERFORMANCE

- A. Watertight and airtight installation is required for each piece of glass installed in an exterior wall.
- B. Each installation must withstand normal temperature changes, wind loading, and impact from normal operation for doors, without failure of any kind including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glazing materials and other defects in the Work.
 - 1. Installed glass shall be free from rattle.
- C. Protect glass from damage at all times during handling, installation and operation of the building until Substantial Completion.
- D. Comply with combined recommendations of glass manufacturer and manufacturer of sealants and other materials used in glazing, except where more stringent requirements are specified.
- E. Comply with FGMA, Glazing Manual, and Sealant Manual, guidelines, except as recommended otherwise by the manufacturers of the glass and glazing materials.
- F. Inspect each piece of glass immediately before installation, and eliminate those with edge damage or face imperfections.
- G. Unify appearance of each series of lights by setting each piece to match others as nearly as possible. Inspect each piece and set with pattern, draw and bow oriented in the same direction as other pieces.

3.03 PREPARATION FOR GLAZING

- A. Immediately before glazing, clean the glazing channel and other framing members to receive glass.
 - 1. Remove coatings which are not firmly bonded to the substrate.
 - 2. Verify that framing is satisfactory to receive the glass.
- B. Apply primer or sealer to joint surfaces when recommended by sealant manufacturer.

3.04 GLASS INSTALLATION

- A. Install setting blocks of proper size for all glass. Use glass manufacturer's recommended size and spacing. Set blocks in thin course of the heel-bead compound, if used; do not block weep holes.
- B. Provide spacers inside and out unless continuous gaskets are used. Use glass manufacturer recommended size and spacing.

- C. Prevent exudation of sealant or compound by forming voids or installing filler rods in the channel at the heel of jambs and head (do not leave voids in the sill channels, except as needed for drainage and weep holes) depending on light size, thickness and type of glass, and complying with manufacturer's recommendations.
- D. Do not nip glass. Do not install glass with edge damage.
- E. Force sealants into channel to eliminate voids and to assure complete "wetting" or bond of sealant to glass and channel surfaces.
- F. Tool exposed surfaces of sealants to provide a substantial "wash away" from the glass. Install pressurized gaskets to protrude slightly out of the channel, so as to eliminate dirt and moisture pockets.
- G. Clean and trim excess glazing materials from the glass, stops and frames promptly after installation, and eliminate stains and discolorations.
- H. Where wedge-shaped gaskets are driven into one side of the channel to pressurize the sealant or gasket on the opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when subjected to dynamic movement.
 - 1. Anchor gasket to stop with matching ribs, or with adhesive.

3.05 CURING / PROTECTING / CLEANING

- A. Cure glazing sealants and compounds in compliance with their manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability.
- B. Protect glass from breakage immediately upon installation. Do not apply markers of any type to glass.
- C. Before Substantial Completion, remove and replace glass which is broken, chipped, cracked, abraded, stained or damaged in other way, including natural causes, accidents and vandalism.
- D. Maintain glass in a clean condition during construction so that it will not be damaged by corrosive action and will not contribute (by wash-off) to the deterioration of glazing materials and other work.
- E. Remove remaining labels and wash and polish glass on both faces not more than 4 days prior to District's acceptance of the work in each area. Comply with glass manufacturer's recommendations.

END OF SECTION

**SECTION 09 24 00
PORTLAND CEMENT PLASTER**

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior portland cement plasterwork (stucco) on metal lath.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show locations and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other work.
- C. Samples: For each type of factory-prepared finish coat indicated.

1.3 QUALITY ASSURANCE

- A. Fire-Resistance Ratings: Where indicated, provide portland cement plaster assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- B. Mockups: Before plastering, install mockups of at least 100 sq. ft. (9.3 sq. m) in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.
 1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 PROJECT CONDITIONS

- A. Comply with ASTM C 926 requirements.
- B. Factory-Prepared Finishes: Comply with manufacturer's written recommendations for environmental conditions for applying finishes.

PART 2 - PRODUCTS

2.1 METAL LATH

- A. Expanded-Metal Lath: ASTM C 847 with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized zinc coating.
 1. Diamond-Mesh Lath: Self-furring, 2.5 lb/sq. yd. (1.4 kg/sq. m).
- B. Paper Backing: FS UU-B-790, Type I, Grade D, Style 2 vapor-permeable paper.

1. Provide paper-backed lath at exterior locations.

2.2 ACCESSORIES

- A. General: Comply with ASTM C 1063 and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.
- B. Metal Accessories:
 1. Foundation Weep Screed: Fabricated from hot-dip galvanized-steel sheet, ASTM A 653/A 653M, G60 (Z180) zinc coating.
 2. Cornerite: Fabricated from metal lath with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized zinc coating.
 3. External-Corner Reinforcement: Fabricated from metal lath with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized zinc coating.
 4. Cornerbeads: Fabricated from zinc-coated (galvanized) steel.
 - a. Small-nose style; use unless otherwise indicated.
 5. Casing Beads: Fabricated from zinc-coated (galvanized) steel; square-edged style; with expanded flanges.
 6. Control Joints: Fabricated from zinc-coated (galvanized) steel; one-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
 7. Expansion Joints: Fabricated from zinc-coated (galvanized) steel; folded pair of unperforated screeds in M-shaped configuration; with expanded flanges.
 8. Two-Piece Expansion Joints: Fabricated from zinc-coated (galvanized) steel; formed to produce slip-joint and square-edged reveal that is adjustable from 1/4 to 5/8 inch (6.34 to 16 mm) wide; with perforated flanges.
- C. Plastic Accessories: Fabricated from high-impact PVC.
 1. Cornerbeads: With perforated flanges.
 - a. Small-nose style; use unless otherwise indicated.
 2. Casing Beads: With perforated flanges in depth required to suit plaster bases indicated and flange length required to suit applications indicated.
 - a. Square-edge style; use unless otherwise indicated.
 3. Control Joints: One-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
 4. Expansion Joints: Two-piece type, formed to produce slip-joint and square-edged 1/2-inch- (13-mm-) wide reveal; with perforated concealed flanges.

2.3 MISCELLANEOUS MATERIALS

- A. Water for Mixing: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.
- B. Fiber for Base Coat: Alkaline-resistant glass or polypropylene fibers, 1/2 inch (13 mm) long, free of contaminants, manufactured for use in portland cement plaster.

- C. Steel Drill Screws: For metal-to-metal fastening, ASTM C 1002 or ASTM C 954, as required by thickness of metal being fastened; with pan head that is suitable for application; in lengths required to achieve penetration through joined materials of no fewer than three exposed threads.
- D. Fasteners for Attaching Metal Lath to Substrates: Complying with ASTM C 1063.
- E. Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, not less than 0.0475-inch (1.21-mm) diameter, unless otherwise indicated.

2.4 PLASTER MATERIALS

- A. Portland Cement: ASTM C 150, Type I.
- B. Lime: ASTM C 206, Type S; or ASTM C 207, Type S.
- C. Sand Aggregate: ASTM C 897.
 - 1. Color for Job-Mixed Finish Coats: as indicated on drawings.
- D. Acrylic-Based Finish Coatings: Factory-mixed acrylic-emulsion coating systems, formulated with colorfast mineral pigments and fine aggregates; for use over portland cement plaster base coats. Include manufacturer's recommended primers and sealing topcoats for acrylic-based finishes.
 - 1. Color: As selected by Architect from manufacturer's full range.

2.5 PLASTER MIXES

- A. General: Comply with ASTM C 926 for applications indicated.
 - 1. Fiber Content: Add fiber to base-coat mixes after ingredients have mixed at least two minutes. Comply with fiber manufacturer's written instructions for fiber quantities in mixes, but do not exceed 1 lb of fiber/cu. yd. (0.6 kg of fiber/cu. m) of cementitious materials.
- B. Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork as follows:
 - 1. Portland Cement Mixes:
 - a. Scratch Coat: For cementitious material, mix 1 part portland cement and 3/4 to 1-1/2 parts lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
 - b. Brown Coat: For cementitious material, mix 1 part portland cement and 3/4 to 1-1/2 parts lime. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.
 - 2. Masonry Cement Mixes:
 - a. Scratch Coat: 1 part masonry cement and 2-1/2 to 4 parts aggregate.
 - b. Brown Coat: 1 part masonry cement and 3 to 5 parts aggregate, but not less than volume of aggregate used in scratch coat.
 - 3. Portland and Masonry Cement Mixes:

- a. Scratch Coat: For cementitious material, mix 1 part portland cement and 1 part masonry cement. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
 - b. Brown Coat: For cementitious material, mix 1 part portland cement and 1 part masonry cement. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.
- 4. Plastic Cement Mixes:
 - a. Scratch Coat: 1 part plastic cement and 2-1/2 to 4 parts aggregate.
 - b. Brown Coat: 1 part plastic cement and 3 to 5 parts aggregate, but not less than volume of aggregate used in scratch coat.
- 5. Portland and Plastic Cement Mixes:
 - a. Scratch Coat: For cementitious material, mix 1 part plastic cement and 1 part portland cement. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
 - b. Brown Coat: For cementitious material, mix 1 part plastic cement and 1 part portland cement. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.
- C. Factory-Prepared Finish-Coat Mixes: For acrylic-based finish coatings, comply with manufacturer's written instructions.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.
- B. Prepare solid substrates for plaster that are smooth or that do not have the suction capability required to bond with plaster according to ASTM C 926.

3.2 INSTALLATION, GENERAL

- A. Fire-Resistance-Rated Assemblies: Install components according to requirements for design designations from listing organization and publication indicated on Drawings.
- B. Sound Attenuation Blankets: Where required, install blankets before installing lath unless blankets are readily installed after lath has been installed on one side.

3.3 INSTALLING ACCESSORIES

- A. Install according to ASTM C 1063 and at locations indicated on Drawings.
- B. Reinforcement for External Corners:
 - 1. Install lath-type, external-corner reinforcement at exterior locations.
 - 2. Install cornerbead at exterior locations.
- C. Control Joints: Install control joints at locations indicated on Drawings.

1. As required to delineate plasterwork into areas (panels) of the following maximum sizes:
 - a. Vertical Surfaces: 144 sq. ft. (13.4 sq. m).
 - b. Horizontal and other Nonvertical Surfaces: 100 sq. ft. (9.3 sq. m).
2. At distances between control joints of not greater than 18 feet (5.5 m) o.c.
3. As required to delineate plasterwork into areas (panels) with length-to-width ratios of not greater than 2-1/2:1.
4. Where control joints occur in surface of construction directly behind plaster.
5. Where plasterwork areas change dimensions, to delineate rectangular-shaped areas (panels) and to relieve the stress that occurs at the corner formed by the dimension change.

3.4 PLASTER APPLICATION

- A. General: Comply with ASTM C 926.
- B. Walls; Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork, 3/4-inch (19-mm) thickness.
 1. Portland cement mixes.
 2. Masonry cement mixes.
 3. Portland and masonry cement mixes.
 4. Plastic cement mixes.
 5. Portland and plastic cement mixes.
- C. Ceilings; Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork; 1/2 inch (13 mm) thick.
 1. Portland cement mixes.
 2. Masonry cement mixes.
 3. Portland and masonry cement mixes.
 4. Plastic cement mixes.
 5. Portland and plastic cement mixes.
- D. Plaster Finish Coats: Apply to provide finish to match existing building.
- E. Acrylic-Based Finish Coatings: Apply coating system, including primers, finish coats, and sealing topcoats, according to manufacturer's written instructions.

3.5 PLASTER REPAIRS

- A. Repair or replace work to eliminate cracks, dents, blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

END OF SECTION

**SECTION 09 90 00
PAINTING**

PART 1 – GENERAL

1.1 SECTION INCLUDES:

- A. This section covers painting of exposed elements of the project, interior and exterior, Sealing and back priming of wood in the field. Surfaces that are left unfinished by requirements of other sections shall be finished as part of this section.

1.2 SECTION EXCLUDES:

- A. Control panels and control systems.
- B. Fabric connections to fans.
- C. Flexible conduit connections to equipment, miscellaneous name plates, stamping and instruction labels and manufacturer's data.
- D. Equipment and products having a complete factory finish, except as specified or noted on drawings.
- E. Flag, floodlight, parking light poles and loudspeaker poles furnished with a factory finish.
- F. The following items if specified or furnished with galvanized finish shall not be painted: Metal shelving, chain link fencing, areaway and catch basin gratings and frames.
- G. Brass, bronze, lead, stainless steel, and chrome or nickel-plated elements.
- H. Non-metallic walking surfaces unless specifically shown or specified to be painted.
- I. Fire rating labels at fire doors and frames.
- J. Cement masonry units at exterior.

1.3 RELATED SECTIONS:

- A. Section 05 50 00 – Metal Fabrications.
- B. Section 09 24 00 – Portland Cement Plaster.

1.4 QUALITY ASSURANCE

- A. Certification of Materials: With every delivery of paint materials, the manufacturer shall certify on the manufacturer's letterhead that materials comply with the requirements of this section.
- B. Paint materials shall comply with the Food and Drug Administration's (F.D.A.) Lead Law and the current rules and regulations of local, state and federal agencies governing the use of paint materials.
- C. Coats: The number of coats specified is the minimum number acceptable. If full coverage is not obtained with the specified number of coats, apply such additional coats as are necessary to produce the required finish.

- D. Employ coats and undercoats for all types of finishes in strict accordance with the recommendations of the paint manufacturer and approved by Architect.

1.5 SUBMITTALS

- A. Submittals shall be made in accordance with Section 01 33 00.
- B. List of Paint Materials: Prior to submittal of samples, submit a complete list of proposed paint materials, identifying each material by manufacturer's name, product name and number, including primers, thinners, and coloring agents, together with manufacturers' catalog data fully describing each material as to contents, recommended usage, and preparation and application methods. Identify surfaces to receive various paint materials. Do not deviate from approved list.
- C. Submit manufacturer's standard color samples for each type of paint used. Once colors have been selected, submit 3 samples of each color selected for each type of paint, on standard 8-1/2 x 11 inch spray-out panel with substrate textures demonstrated.
- D. For transparent and stained finishes, prepare samples (16" long) on same species and quality of wood to be installed on the project, showing system used and each step of the finishing process>.
- E. Manufacturers shall verify that their products conform to latest California Air Resources Board and AQMD regulations.
- F. An MSDS sheet will be included with each individual submittal.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Materials shall be delivered to the project site in original unbroken containers bearing manufacturer's name, brand number and batch number corresponding to description on list of materials as approved.
- B. Open and mix ingredients on the premises in the presence of the District Inspector. Immediately remove rejected materials from the premises.
- C. Storage and Mixing of Materials: Store materials and mix only in spaces designated for the purpose by the District Inspector. Keep such spaces clean and take necessary precautions to prevent fire. Hang out oily rags flat and singly in the open air. Stack paint containers so that manufacturer's labels are clearly displayed.

1.7 ENVIRONMENTAL CONDITIONS

- A. General: Follow mfr.'s printed recommendations for product when they are more stringent than limits stated herein.
- B. Do not apply "paint" to "wet-applied" construction until such work is "dry", and acceptable to Construction Manager and "paint" mfr.
- C. Temperature and Humidity: Do not apply exterior paint in damp, rainy or foggy weather (above 90% relative humidity) or until the surface has thoroughly dried from the effects of such weather. Do not apply paint, interior or exterior, when the temperature is below 50 or above 100 degrees F., or dust conditions are unfavorable to proper workmanship.
- D. Ventilation: As necessary to provide air movement, aid drying, disperse noxious fumes.

1.8 GUARANTEE

- A. Materials and workmanship guarantee shall be in accordance with the requirements of the Contract Documents, except that guarantee shall be furnished jointly by the Contractor and the materials manufacturer.

PART 2 – PRODUCTS

2.1 PAINT MATERIALS

- A. General: All materials used in the work are listed for Dunn-Edwards Paint. PPG has been adopted by the LSD Board of Education as the “sole source” paint for use in the District. Provide PPG products equal to Dunn-Edwards scheduled items.
- B. Regulatory changes may affect the formulation, availability, or use of specified coatings. Verify with supplier or your representative regarding such changes prior to start of painting project.
- C. Use the paint products of one Paint manufacturer unless otherwise specified or approved. In any case, primers, intermediate and finish coats in each painting system must all be the products of the same manufacturer, including thinners and coloring agents, except for materials furnished with shop prime coat by other trades. To the maximum extent feasible, factory mix paint materials to correct color, gloss, and consistency for application. Dunn-Edwards products are specified herein except as otherwise noted, to establish types and qualities.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Inspect surfaces to receive paint finish for surface blemishes and repair as required. Surfaces that are not properly prepared or sandpapered or cleaned or which are not in condition to receive the specified finish, shall be corrected, before priming is done. Wash and rinse walls and trim with T.P.S. before applying any primer. No priming shall be done until District IOR Inspector or the Owner’s representative approves the surfaces.
- B. Protect floors and all adjacent surfaces from paint smears, spatters, and accidental droppings. Cover fixtures and remove hardware not to be painted. Mask off areas where necessary. Any accidental spills, over-painting or spatters shall be cleaned up immediately before additional work proceeds.

Hardware: Insure that hardware is removed before painting is started and replaced only when paint finishes are thoroughly dry.

- 1. Removal and reinstallation of hardware is specified in Section 06200--Finish Carpentry and Millwork.
- 2. Items to be removed include, without limitation: Signs and graphics; switch and receptacle plates; escutcheons and plates; all surface-mounted equipment; free-standing equipment blocking access; grilles and louvers at ducts opening into finished spaces; all tape on doors, walls or other District property; and other items as required and directed.
- C. Woodwork shall be thoroughly cleaned, hand sandpapered parallel to the grain, and dusted off. Nail holes, cracks or defects in all work shall be carefully puttied. Caulk all

woodwork joints with specified caulking. Wash and rinse trim with T.P.S. both before applying any primer. On stained woodwork the putty shall be colored to match the stain. Puttying shall be done after the first coat of paint, shellac or varnish has been applied.

- D. Gypsum board: Remove all foreign matter. Fill all pits flush and smooth with spackle. Wash and rinse Gypsum board walls with T.P.S. before applying any primer.
- E. Plaster surfaces shall be allowed to dry at least 3 weeks before painting, or plaster shall be allowed to dry sufficiently to receive paint as determined by moisture meter tests. Clean off dirt, dust, excess mortar, encrustation and foreign matter. Fill holes, pits and other imperfections flush and smooth. Wash and rinse Plaster walls with T.P.S. before applying primer.
- F. Concrete Surfaces shall be dry, cleaned of dirt and foreign materials and in proper condition to receive paint. Neutralize spots showing effects of alkali.
- G. Metal surfaces to be painted shall be thoroughly cleaned of rust, corrosion, oil, foreign materials, blisters, and loose paint removed to bright metal. Apply the metal paint preparation coating recommended by the paint manufacturer prior to applying the primer. All shop and field painted metal shall follow these procedures.
- H. Surfaces Not Mentioned: Prepare surfaces according to recommendations of the paint manufacturer and as approved by the Architect or the Owner.
- I. Do not apply painting materials to wet, damp, dusty, dirty, fingermarked, rough, unfinished, or defective surfaces.
- J. Bond breakers and curing agents must be removed and the surface cleaned, as specified in section 3.01-A above, before primers, sealers or finish paints are applied.

3.2 APPLICATION

- A. General: Employ experienced painters supervised by a foreman with a minimum of 5 years' experience in public works projects, thoroughly familiar with code requirements, the best recommendations of the painting materials manufacturer. Utilize the following methods and procedures:
 - 1. Apply material evenly, free from sags, runs, crawls, holidays or defects. Mix to proper consistency, brush out smooth, leaving minimum of brush marks, enamel uniformly flowed on. Sand between enamel coats.
 - 2. Apply paint by brushes, rollers or spray except rollers shall not be used on wood surfaces or on wood floors. If rollers are used on other surfaces, then all surfaces shall be brushed out by hand. Spraying is not permitted on wood floors. Paint wood floors by using a hand brush, applying the paint at the specified application rate as recommended by the manufacturer. Apply in thin coats allowing proper drying time between coats. The use of two ventilation fans is required in each room to accelerate the drying of the floors. One fan in the door pushing air into the room and one fan in a window exhausting air out of the room. Keep fans running until all paint fume smells and non-existence in the rooms.
 - 3. Tint all pigmented undercoats to approximately same shade as final coat. Perceptibly increase the depth of shade in successive coats.
 - 4. Allow each coat to thoroughly dry before succeeding coat application, a minimum of 24 hours. Sand between enamel coats.

5. Finish all four edges of doors with the same number and kind of coatings as specified for their main surfaces on all new or reused doors. Where opening into rooms have different finishes, finish door edges to match the side into which it swings. The top of all doors that open to the outside shall have a continuous painted top coating to prevent moisture from penetrating the door material.
 6. Finish mill or shop primed items with materials compatible with prime coat.
 7. Mechanical and electrical work shall be cleaned, pretreated and painted with 3 coats or as noted:
 - a. Paint that portion of ductwork or plenum spaces, the interior of which is visible through the grilles: they shall be pretreated and painted with 2 coats of flat black paint.
 - b. Shop primed metal surface of all mechanical and electrical equipment shall receive two finish coats of paint to match adjoining wall or ceiling surfaces. Prime coat, in addition to above, on all unprimed surfaces.
 - c. All other mechanical and electrical equipment exposed to view, such as covered and uncovered piping and ductwork, supports for piping and ductwork, pumps compressors, air conditioning equipment, tanks, etc., shall be painted as specified herein, where not supplied finished under other sections.
 8. Miscellaneous painting: Surfaces to be painted and not specifically described herein shall be painted with a product specifically manufactured or prepared for the material and surface; prime coat and two finish coats and subjected to all the conditions previously mentioned above governing painting.
- B. Back-painting: Immediately upon delivery to the building, exterior finish lumber and millwork shall be back-painted on surfaces that will be concealed after installation. Items to be painted shall be back-painted with the priming coat specified under "Priming".
- C. Priming: Wood and metal surfaces specified to receive paint finish shall be primed as specified in section 3.01. Surfaces of miscellaneous metal and steel not embedded in concrete, and surfaces of unprimed plain sheet metal work shall be primed immediately upon delivery to the project. Galvanized metal work and interior and exterior woodwork shall be primed immediately after erection. Priming of surfaces and priming coat shall be as follows and as specified in schedule.
1. Knots, Pitch and Sap Pockets: Shellac, or approved equivalent, before priming.
 2. Exterior Woodwork: Prime with one coat of exterior water borne emulsion wood primer.
 3. Interior Woodwork: Where indicated to be painted, prime with one coat of water borne wood primer.
 4. Stain: Woodwork indicated to receive a stain and varnish finish shall be stained to an even color with water borne stain. On open-grained hardwood, mix stain with paste filler and completely fill pores in wood.
 5. Galvanized Metal Work: Clean oil, grease and other foreign materials from surfaces. Apply the recommended muratic acid etching solution and thoroughly wash metal. Apply pretreatment coating and follow manufacturer's instructions for drying time, and then prime with one coat of metal primer as specified in section 3.01.

6. Unprimed Iron, Steel, and Other Uncoated Metals: Where specified to be painted, prime with one coat of metal primer as specified in section 3.01..
 7. Shop Primed Metal Items: Metal shall be primed as specified in section 3.01 and touch up bare and abraded areas with metal primer prior to application of second and third coats.
- D. The number of paint coats specified to be applied are the minimum required. Apply additional coats if required to obtain complete coverage and approved results. Ensure acceptable paint finishes of uniform color, free from cloudy or mottled areas and evident thinness on arises. "Spot" or undercoat surfaces as necessary to produce such results. Conform to the approved Samples. Obtain approval of each coat before applying next coat. If this inspection step is missed, apply an additional coat over entire surface involved at no additional contract cost.
 - E. Each coat of painted woodwork and metal, except the last coat, shall be sandpapered smooth when dry. Texture-coated gypsum board shall be sanded lightly to remove surface imperfections after first coat of paint has been applied.
 - F. Each coat of paint or enamel shall be a slightly different shade as directed. The District Inspector will inspect each coat of paint, enamel, stain, shellac, and varnish before the next coat is applied. Notify the District Inspector that such work is ready for inspection. If this inspection step is missed, apply an additional coat over entire surface involved at no additional contract cost. FASO will be sent 48 hour notices for paint completion inspection.
 - G. Do not "paint-out" underwriters' labels, fusible links, sliding surfaces and identification stamps.
 - H. Damaged shop prime coat shall be touched-up with metal primer prior to application of second and third coats.
 - I. Apply each coat of material to the manufacturers recommended dry film thickness and spread rate.

3.3 CLEANING

- A. Remove rubbish, waste and surplus material and clean woodwork, hardware, floors and other adjacent work.
- B. Remove paint, varnish and brush marks from glazing material and, upon completion of the painting work, wash and polish the glazing material both sides. Glazing material that is damaged shall be removed and replaced with new material at no cost to the District.
- C. Clean hardware and other unpainted metal surfaces with approved cleaner. Do not use abrasives or edged tools.
- D. Leave paint storage spaces clean and in condition required for equivalent spaces in the project. Specified shelf stock shall consist of new unopened paint containers and shall be turned over to the District per the contract documents.
- E. Collect waste material, which may constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.4 EXTERIOR PAINT SCHEDULE

- A. Metal Work; Exterior:

1. Galvanized Metal & Galvanized Metal Deck; Exterior:
 - a. Preparation: Before application, properly clean and etch (solvent wash) galvanized surfaces in accordance with preparation instructions for galvanized metal per Articles 3.02 H and 3.04F herein.
 - b. Pretreat: KRUPP KUTTER Metal Cleaner and Etch SC ME-01
 - c. Coat 1: ULTRASHIELD Galvanized Primer (ULGM00)
 - d. Coat 2: 100% Acrylic Semi-Gloss Enamel EVERSIELD (EVSH50)
Or 100% Acrylic Gloss Enamel EVERSIELD (EVSH60)
 - e. Coat 3: EVERSIELD 100% Acrylic Semi-Gloss Enamel-(EVSH50)
Or EVERSIELD, 100% Acrylic Gloss Enamel (EVSH60)
 - f. Total DFT: 5.0 mils.
2. Ungalvanized Steel; Apply first prime coat immediately after steel is cleaned.
 - a. Coat 1: ENDURPRIME Rust Inhibitive Primer (ENPR00)
 - b. Coat 2: 100% Acrylic Enamel Sash EVERSIELD, 100% Acrylic Semi-Gloss Enamel (EVSH50)
or EVERSIELD, 100% Acrylic Gloss Enamel (EVSH60)
 - c. Coat 3: 100% Acrylic Enamel Sash EVERSIELD, 100% Acrylic Semi-Gloss Enamel (EVSH500)
Or EVERSIELD, 100% Acrylic Gloss Enamel (EVSH60)
 - d. Total DFT 5.0 mils.
3. Ungalvanized Steel: Concealed: Apply prime coat immediately after steel is cleaned.
 - a. Scope: Apply to all structural steel surfaces hidden and enclosed, within the building envelope (not exposed to view), except members with flanges 1/4" or thicker and webs 3/16" or thicker need NOT to be painted.
 - b. Pretreat: KRUPP KUTTER Metal Cleaner and Etch SC ME-01
 - c. Prime Coat: ULTRASHIELD Galvanized Primer (ULGM00)
 - d. Total DFT: 2.0 mils.
4. All Shop Primed Metals; Exterior:
 - a. Preparation: Touch up damaged, scratched, or missing prime coat paint using top-quality rust-inhibitive primer recommended by paint mfr. lightly sand smooth, ready to receive finish coats.
 - b. Coat 1: ENDURPRIME Rust Inhibitive Primer (ENPR00)
 - c. Coat 2: 100% Acrylic Enamel-EVERSIELD, 100% Acrylic Semi-Gloss Enamel (EVSH50)
or EVERSIELD, 100% Acrylic Gloss Enamel (EVSH60)
 - d. Coat 3: 100% Acrylic Enamel Sash EVERSIELD, 100% Acrylic Semi-Gloss Enamel (EVSH500)
Or EVERSIELD, 100% Acrylic Gloss Enamel (EVSH60)
 - e. Total DFT: 5.0 mils.
5. Factory Finished Equipment & Items:
 - a. Follow paint mfr's. recommendations, and specifications.
 - b. Coat 1: Acrylic Enamel Sash & Trim EVERSIELD, 100% Acrylic Semi-Gloss Enamel (EVSH50)
or EVERSIELD, 100% Acrylic Gloss Enamel (EVSH60)

- c. Coat 2: 100% Acrylic Enamel-EVERSHIELD, 100% Acrylic Semi-Gloss Enamel (EVSH50)
or EVERSHIELD, 100% Acrylic Gloss Enamel (EVSH60)
 - d. Total DFT: 3.0 mils.
- 6. Aluminum; Where Indicated To Be Painted Or Where Previously Painted:
 - a. Follow paint mfr's. recommendations, and specifications.
 - b. Prepare surface by phosphatizing and cleaning same as for Galvanized Surfaces, Articles 3.02H and 3.04F.
 - c. Pretreat: KRUDD KUTTER Metal Cleaner and Etch SC ME-01
 - d. Coat 1: ULTRASHIELD Galvanized Primer (ULGM00)
 - e. Coat 2: 100% Acrylic Enamel EVERSHIELD, 100% Acrylic Semi-Gloss Enamel (EVSH50)
 - f. Coat 3: 100% Acrylic Enamel EVERSHIELD, 100% Acrylic Semi-Gloss Enamel (EVSH60)
 - g. Total DFT: 5.0 mils.
- B. Exterior Work: Other Than Metals: Existing and At Repairs or New to Match Existing; Match Existing Finishes/Paint:
 - 1. Wood (Painted):
 - a. Coat 1: Exterior Wood Primer E-Z Premium PRIME, Ext. 100% Acrylic Wood Primer (EZPR00-0)
 - b. Coat 2: 100% Acrylic Exterior Wood EVERSHIELD, 100% Acrylic Semi-Gloss Enamel (EVSH50)
 - c. Coat 3: 100% Acrylic Exterior Wood EVERSHIELD, 100% Acrylic Semi-Gloss Enamel (EVSH50)
 - d. Total DFT: 5.0 mils.
 - 2. Wood (Stained/Natural Finish) Smooth or "Rough Surface" Materials, Trim, Boards, Fascia, Etc., Wood Trellis Siding, Trim, Boards, and Fascia:
 - a. Prime all surfaces of all new pieces completely before installation (faces, edges, ends). After installation, inspect members; touch-up any damage, cuts, and nail holes.
 - b. Coat 1: Exterior Wood Stain OKON Weather Pro, Solid or Semi-Transparent
 - c. Coat 2: Exterior Wood Stain OKON Weather Pro, Solid or Semi-Transparent
 - d. Application Rate: 250 sf./per gallon/per coat.
 - 3. Cement Plaster:
 - a. Coat 1: Masonry Concrete Sealer EFF-STOP PERMIUM Masonry Primer/Sealer (ESPR00)
 - b. Coat 2: Exterior Masonry Finish EVERSHIELD, 100% Acrylic Ext. Masonry Finish (EVSH10)
or EVERSHIELD, 100% Acrylic Semi-Gloss Enamel (EVSH50)
 - d. Coat 3: Exterior Masonry Finish EVERSHIELD, 100% Acrylic Ext. Masonry Finish (EVSH10)
or EVERSHIELD, 100% Acrylic Semi-Gloss Enamel (EVSH50)
 - d. Total DFT: 5.0 mils.

4. Concrete; Columns, Wall Caps, Beams, Wall Exposed Foundation Walls & Curbs and Where Indicated:
 - a. Coat 1: Masonry/Concrete Sealer, on bare concrete and as required EFF-STOP PERMIUM (ESPR00)
 - b. Coat 2: Exterior Masonry Finish EVERSIELD, 100% Acrylic Ext. Masonry Finish (EVHS10)
or EVERSIELD, 100% Acrylic Semi-Gloss Enamel (EVSH50)
 - e. Coat 3: Exterior Masonry Finish EVERSIELD, 100% Acrylic Ext. Masonry Finish (EVHS10)
or EVERSIELD, 100% Acrylic Semi-Gloss Enamel (EVSH50)
 - f. Total DFT: 5.0 mils.
5. Concrete Block: Wall Caps
 - a. Coat 1: Masonry Filler BLOCFIL SMOOTH BLOCFIL PREMIUM, Concrete Block Filler, Smooth (SBPR00)
 - b. Coat 2: Concrete Sealer
 - c. Coat 3: Exterior Masonry Finish EVERSIELD, 100% Acrylic Ext. Masonry Finish (EVHS10)
or EVERSIELD, 100% Acrylic Semi-Gloss Enamel (EVSH50)
 - d. Coat 4: Exterior Masonry Finish EVERSIELD, 100% Acrylic Ext. Masonry Finish (EVHS10)
or EVERSIELD, 100% Acrylic Semi-Gloss Enamel (EVSH50)
 - e. Total DFT 6.5 mils.
6. Painted Stripes At Exterior Concrete Stairs; Conform to State HDCP Requirements:
 - a. Stripes: 2" wide, Located 1" max from and parallel to nosing.
 - b. Required Locations: All treads and upper approach of each flight of stairs.
 - c. Application Rate: 2 coats of Traffic Paint, at 300 sf/per gallon per coat.
 - d. VIN-L-STRIPES, (VSZM10)
7. Plastic or Rubber Condensate Piping & Other Plastic Piping Exposed on Roof-Tops:
 - a. Coat 1: Latex Primer Primer SUPER LOC Primer (SLPR00)
 - b. Coat 2: 100% Acrylic Enamel EVERSIELD, 100% Acrylic Semi-Gloss Enamel (EVSH50)
 - c. Application Rate/DFT for finish coats: As required to cover completely one coat to cover.
8. Painted Stripes at Exterior Concrete Stairs; Conform to State HDCP Requirements:
 - a. Required Locations: Bottom tread and upper approach of each flight of stairs, where indicated.
 - b. Stripes: 2" wide, located 1" max from parallel to nosing.

- c. Applications Rate: 2 coats of Traffic Paint, at 300 sf/ per gallon per coat.
VIN-L-STRIPE, (VSZM00)

3.5 INTERIOR PAINT SCHEDULE

A. Interior Work: Typically Match Existing Finishes/Paint:

1. Softwood; Typically, and Medium Density Overlaid (MDO) Doors; Existing and at Repairs or New to Match Existing:
 - a. Coat 1: Latex Primer ULTRA-GRIP PERMIUM, Multi-Purpose Latex Primer (UGRP00)
 - b. Coat 2: 100% Acrylic Semi-Gloss Enamel SUPREMA, 100% Acrylic Semi-Gloss Enamel (SPMA50)
 - c. Coat 3: 100% Acrylic Semi-Gloss Enamel SUPREMA, 100% Acrylic Semi-Gloss Enamel (SPMA50)
 - d. Total DFT: 5.0 mils.
2. Interior Hardwood Doors, Paneling, Doors, Transom Panels, Trim, Handrails, Softwood Casework, Paneling & Casework & Similar; With Stained/Natural Finish/Transparent Finish and; where not factory finished, Plastic Laminate, or Painted:
 - a. Sealer: At contractor's option and expense N/A
 - b. Coat 1: NOT NEEDED DEFTHANE IS SELF SEALING
 - c. Coat 2: Gloss Varnish DEFTHANE W/B Polyurethane Gloss
 - d. Coat 3: Gloss Varnish DEFTHANE W/B Polyurethane Gloss
 - e. Coat 4: Satin Varnish DEFTHANE W/B Polyurethane Satin
 - f. DFT: 3.5 mils.
 - g. Lacquer Option: With specific approval or Architect Construction Manager & District, Lacquer may be used in lieu of varnish. CE-275-WW-50
 - h. In existing buildings, match existing finishes unless noted otherwise.
3. "Rough Surface" Wood Trim; Existing and at Repairs or New to Match Existing:
 - a. After installation, inspect members; touch-up any damage, cuts and nail holes.
 - b. Coat 1: Exterior Wood Stain OKON Weather Pro, Solid or Semi-Transparent
 - c. Coat 2: Exterior Wood Stain OKON Weather Pro, Solid or Semi-Transparent
 - d. Application Rate: 300 sf/per gallon per coat.
4. "Smooth Surface" Plywood at Equipment Backboards:
 - a. Coat 1: Latex Primer ULTRA-GRIP PREMIUM, Multi-Purpose Latex Primer (UGPR00)
 - b. Coat 2: Enamel Semi-Gloss, SUPREMA Int.100% Acrylic Semi-Gloss Enamel (SPMA50)
 - c. Coat 3: Enamel, Semi-Gloss SUPREMA Int.100% Acrylic Semi-Gloss Enamel (SPMA50)
 - d. Total DFT: 5.0 mils.

5. Existing Painted Casework and or Painted Wall Paneling:
 - a. Coat 1: Latex Primer ULTRA-GRIP PREMIUM, Multi-Purpose Latex Primer (UGPR00)
 - b. Coat 2: Enamel, Semi-Gloss SUPREMA, 100% Acrylic Semi-Gloss Enamel (SPMA50)
 - c. Coat 3: Enamel, Semi-Gloss SUPREMA, 100% Acrylic Semi-Gloss Enamel (SPMA50)
 - d. Total DFT: 5.0 mils.
6. Plaster Walls & Ceilings; Existing and at Repairs or New to Match Existing:
 - a. Coat 1: Latex Primer ULTRA-GRIP PREMIUM, Multi-Purpose Latex Primer (UGPR00)
 - b. Coat 2: Typically match existing: One of the following as applicable or selected by Architect Construction Manager:
 - c. Coat 3: Typically match existing: One of the following as applicable or selected by Architect Construction Manager:
 - 1) Enamel Semi-Gloss SUPREMA, 100% Acrylic Semi-Gloss Enamel (SPMA50)
 - d. Total DFT: 5.0 mils.
7. Concrete, Concrete Block and Brick; Existing Painted and at Repairs or New To Match Existing:
 - a. Coat 1: Latex Primer ULTRA-GRIP PREMIUM, Multi-Purpose Latex Primer (UGPR00)
 - b. Coat 2: Enamel SUPREMA, Latex Semi-Gloss Enamel (SPMA50)
 - c. Coat 3: Enamel SUPREMA, Latex Semi-Gloss Enamel (SPMA50)
 - d. Total DFT: 5.0 mils.
8. Drywall Walls: Typical:
 - a. Coat 1: Latex Sealer VINYLASTIC PREMIUM, Interior Pigmented Sealer (VNPR00)
 - b. Coat 2: Enamel Semi-Gloss SUPREMA, Int. 100% Acrylic Semi-Gloss Enamel (SPMA50)
 - c. Coat 3: Enamel Semi-Gloss SUPREMA, Int. 100% Acrylic Semi-Gloss Enamel (SPMA50)
 - d. Total DFT: 5.0 mils.
9. Drywall Ceilings
 - a. Coat 1: Latex Sealer VINYLASTIC PREMIUM, Interior Pigmented Sealer (W 101V) (VNPR00)
 - b. Coat 2: Flat Wall Latex SUPREMA, Interior Velvet Flat Wall Finish (W 401) (SPMA10)
or Enamel Semi-Gloss SUPREMA, Int. 100% Acrylic Semi-Gloss Enamel (SPMA50)
 - c. Coat 3: Flat Wall Latex SUPREMA, Interior Velvet Flat Wall Finish (W 401) (SPMA10)

- or Enamel Semi-Gloss SUPREMA, Int. 100% Acrylic Semi-Gloss Enamel (SPMA50)
- d. Total DFT: 5.0 mils.

10. Drywall Walls & Ceilings At Toilets, Storage Rooms, and Electrical and Mechanical Rooms:

- a. Coat 1: Latex Sealer VINYLASTIC PREMIUM, Interior Pigmented Sealer (VNPR00)
- b. Coat 2: Enamel EVERSIELD, Int. 100% Acrylic Semi-Gloss Enamel (EVSH50)
- c. Coat 3: Enamel, Semi-Gloss EVERSIELD, Int. 100% Acrylic Semi-Gloss Enamel (EVSH50)
- d. Total DFT: 5.0 mils.

B. Metal Work; Interior:

1. Galvanized Metal & Galvanized Metal Deck;

- a. Preparation: Before application, properly clean and etch (solvent wash) galvanized surfaces in accordance with preparation instructions for galvanized metal per Articles 3.02 H and 3.04F herein. (SCME-01)
- b. Coat 1: Metal Primer ULTRASHIELD Galvanized Primer (ULGM00)
- c. Coat 2: 100% Acrylic Enamel EVERSIELD 100% Acrylic Semi-Gloss Enamel (EVSH50)
- d. Coat 3: 100% Acrylic Enamel EVERSIELD, 100% Acrylic Semi-Gloss Enamel (EVSH50)
- e. Total DFT: 5.0 mils.

2. Ungalvanized Steel Interior Apply prime coat immediately after steel is cleaned.

- a. Coat 1: ENDURAPRIME Rust Inhibitive Primer (ENPR00)
- b. Coat 2: 100% Acrylic Enamel EVERSIELD 100% Acrylic Semi-Gloss Enamel (EVSH50)
- c. Coat 3: 100% Acrylic Enamel EVERSIELD, 100% Acrylic Semi-Gloss Enamel (EVSH50)
- e. DFT: 6 mils.

3. Ungalvanized Steel Interior: Concealed: Apply prime coat immediately after steel is cleaned.

- a. Scope: Apply to all structural steel surfaces hidden and enclosed, within the building envelope (not exposed to view), except members with flanges 1/4" or thicker and webs 3/16" or thicker need NOT to be painted.
- b. Prime Coat: ENDURPRIME Rust Inhibitive Primer (ENPR00)
Total DFT: 2 mils.

4. All Shop Primed Metals; Interior:

- a. Preparation: Touch up damaged, scratched, or missing prime coat paint using top-quality rust-inhibitive primer recommended by paint mfr. lightly sand smooth, ready to receive finish coats.
- b. Coat 1: Metal Primer ENDURAPRIME Rust Inhibitive Primer (ENPR00)

- c. Coat 2: 100% Acrylic Enamel EVERSHIELD, 100% Acrylic Semi-Gloss Enamel (EVSH50)
Coat 3: 100% Acrylic Enamel EVERSHIELD, 100% Acrylic Semi-Gloss Enamel (EVSH50)
 - d. Total DFT: 5.0 mils.
- 5. All Shop Primed Metals; Interior:
 - a. Preparation: Touch-up damaged, scratched, or missing prime coat paint using top-quality rust-Inhibitive primer recommended by paint mfr. Lightly sand smooth, ready to receive finish coats.
 - b. Coat 1: Metal Primer ENDURAPRIME Rust Inhibitive Primer (ENPR00)
 - c. Coat 2: W/B Urethane Alkyd Aristoshield Semi-Gloss (ASHL50)
 - d. Coat 3: W/B Urethane Alkyd Aristoshield Semi-Gloss (ASHL50)
 - d. Total DFT: 5.0 mils.
- 6. Factory Finished Equipment & Items:
 - a. Coat 1 Bonding Primer SUPER LOC Bonding Primer (SLPR00)
 - b. Coat 2 W/B Urethane Alkyd ARISTOSHIELD Semi-Gloss (ASHL50)
 - c. Coat 3 W/B Urethane Alkyd ARISTOSHIELD Semi-Gloss (ASHL50)
 - b. Total DFT: 5.0 mils.
- 7. Aluminum; Where Indicated To Be Painted Or Where Previously Painted:
 - a. Follow paint mfr's. recommendations and specifications.
 - b. Prepare surface by phosphatizing and cleaning same as for Galvanized Surfaces, Articles 3.02H and 3.04F.
 - c. Pretreat: KRUD KUTTER Metal Cleaner and Etch SC ME-01
 - d. Coat 1: Latex Primer ULTRASHIELD Galvanized Primer (ULGM00)
 - d. Coat 2: 100% Acrylic Enamel Suprema, 100% Acrylic Semi-Gloss Enamel (SPMA50)
 - e. Coat 3: 100% Acrylic Enamel EVERSHIELD, 100% Acrylic Semi-Gloss Enamel (EVSH50)
 - f. Total DFT: 5 mils.

END OF SECTION

**SECTION 10 14 00
IDENTIFYING DEVICES**

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Plastic signs.
 - 2. Metal signs.

1.2 QUALITY ASSURANCE

- A. Requirements of regulatory agencies, and Codes:
 - 1. State Fire Marshal, Title 19.
 - 2. California Building Code (CBC) and Standards, Section 11B-703.
 - 3. Federal Americans with Disabilities Act (ADA) and to State "Accessibility" Regulations.
- B. Text, numbering and message: The District will provide exact numbering and wording for signs.

1.3 SUBMITTALS

- A. Procedure: In accordance with Section 01 33 00.
- B. Samples: 2 for each type, including the following:
 - 1. Manufacturer's standard color range.
 - 2. One of each typical sign specified.
- C. Product data: Manufacturer's standard brochures describing all items and materials; specific items for this work shall be indicated/highlighted.
- D. Shop drawings: Signs, 4 copies, all work, including fastening devices and backing plates.

PART 2 – PRODUCTS

2.1 MANUFACTURERS/MATERIALS

- A. All other plastic and metal signs:
 - 1. Acceptable manufacturers/products: Mohawk Sign Systems (518.370. 3433) Series No. 200-A, or equal.
 - 2. Description of system: Text, letters, symbols and Braille must be integral.
 - 3. List of signs: Note that all signs specified below may not be required for the Project. Refer to the Drawings and provide all required signage for the Project.
- B. Unframed plastic signs.
 - 1. Plastic - ES plastic: 2-color sandwich with face color contrasting with core color; suitable for interior and exterior use.

2. Text/letters/symbols/Braille: (to comply with 11B-703)
 - a. Raised in accordance with ADA requirements.
 - b. Color contrasting with their background color.
 - c. Created by sandblasting away the face color to expose the surrounding background (core) color.
 - d. Provide corresponding Grade 2 (Contracted) Braille under all lettering and numbers in accordance with ADA.
 - e. Gluing components of signs together is not acceptable.
 3. Type style: "Helvetica Medium" all upper case, 3/4 in. high (72-point).
 4. Arrangement: Standard spacing between letters, words, numbers and lines; centered typically; 2 in. minimum margins.
 5. Edges and corners: Finish edges smooth; 1" in. rounded corners. Provide a screw mounting hole at each corner.
 6. Finish and contrast: Contrast between character, symbols and their background must be 70% minimum and have a non-glare finish.
 7. Sign face colors, and core colors: One face/core color combination for each site will be selected by Architect from manufacturer's standard color range (12 colors minimum).
 8. Code required colors: Where colors are mandated by Codes or regulations, conform to those requirements. Accessibility signage shall be blue color equal to #15090 per Federal Standard 595C. All other colors shall be selected by Architect.
 9. Color type: Integral to sign material; painting is not acceptable.
 10. Mounting: Non-corrosive vandal-resistant screws and double-face, pressure-sensitive foam tape, full length and width of sign.
 11. Braille shall comply with CBC 11B-703. See drawing for additional requirement.
- C. Room number signs:
1. Size: as indicated on drawings.
- D. Room name signs:
1. Wording: Varies from sign to sign, but signs will average 12 letters.
 2. Arrange words in a single line of text where possible within the limitations imposed for number of characters for each line. Use additional lines where necessary to accommodate longer texts. Do not hyphenate words.
- E. Typical sizes: Signs shall be modular. Use combinations of the following height and width dimensions as necessary to suit the wording for each particular type.
1. Heights:
 - a. For 1 line of text: 6 in.
 - b. For 2 lines of text: 6 in.

- c. For 3 lines of text: 6 in.
NOTE: With corresponding Braille.
Braille to be 3/8" minimum – 1/2" maximum below tactile.
 - 2. Length - characters for each line of text:
 - a. 5 characters or less: 6 in.
 - b. 10 characters maximum: 9 in.
 - c. 16 characters maximum: 12 in.
- F. Fire alarm signs:
 - 1. Size: 6 in. high by 6 in. long.
 - 2. Wording: "FIRE ALARM INSIDE"
- G. Plastic "ISA" symbol signs:
 - 1. Figure/symbol style: Recognized standard "International Symbols of Accessibility" such as those developed by the American Institute of Graphics for the US Dept. of Transportation.
 - 2. Types:
 - a. Toilet room door signs: Appropriate Man/Boy or Woman/Girl silhouette figures, superimposed over geometric symbols.
 - (1) Color: White figure on blue geometric symbol.
 - (2) Geometric symbols:
 - (a) For Men/Boys: Equilateral triangle, 12 in. on a side by 1/4 in. thick.
 - (b) For Women/Girls: 12 in. diameter circle by 1/4 in. thick.
 - (c) For All Gender: Equilateral triangle, 12 in. on a side, superimposed over a 12 in. diameter circle; 1/4 in. thick.
 - (3) Location: Refer to the Drawings.
- H. Toilet room permanent wall signs:
 - 1. Size: 8 in. high by 6 in. long, except as indicated – refer to Drawings.
 - 2. Location: Refer to the Drawings.
- I. Building entrance signs:
 - 1. Size: 10 in. high by 8 in. long, except as indicated – refer to Drawings.
 - 2. International "ISA" symbol.
 - 3. Location: Refer to the Drawings.

J. Exit signs:

1. Type size: 3/4 in. high (72-point).
2. Sign size: typically 6 in. high by 8 in. long, except as indicated - refer to Drawings.
3. Location: Refer to Drawings.
4. Wording: Refer to Drawings.

K. Occupancy capacity sign:

1. Type size: 3/4 in. high (72-point).
2. Sign size: 8 in. high by 10 in. long, except as indicated - refer to Drawings.
3. Location: Refer to Drawings.
4. Wording: "CAPACITY OF THIS ROOM LIMITED TO ____ PERSONS"

L. Metal signs - general:

1. Materials: Reflectorized sign, porcelain on steel with beaded text, two 1/4 in. diameter galvanized bolts mounted to galvanized steel post.
 - a. Type imagery:
 - (1) Type style: Helvetica Medium; all upper case.
 - (2) Arrangement: Use standard spacing between letters, words, numbers and lines; center typically.
2. Colors:
 - a. Sign colors, and/or background paint colors: As selected by Architect from manufacturer's standard color range (12 colors minimum); one color maximum.
 - b. White or black, as selected by Architect to contrast with sign or background color; one color maximum.
 - c. Code required colors: Where colors are mandated by Codes or regulations, conform to those requirements. Accessibility signage shall be blue color equal to #15090 per Federal Standard 595C. All other colors shall be selected by Architect.
3. Metal "ISA" symbol signs:
 - a. General: Conform to the State Accessibility Codes.
 - b. Symbol style: Recognized standard "International Symbol of Accessibility" such as that developed by the American Institute of Graphics for the US Department of Transportation.
 - c. Types:
 - (1) Accessible parking stall signs.
 - (2) Accessible path of travel/direction-to-building-entrance signs.

- d. Refer to Drawings for size and configuration.
- M. Metal accessible parking entrance signs:
 - 1. General: Conform to the State Accessibility Codes.
 - 2. Refer to Drawings for size, text and configuration.
- N. Metal fire lane:
 - 1. General: Conform to Fire Code Sec. 10.207 (K, L).
 - 2. Location: To be determined by the Fire Department Inspector.
 - 3. Provide signs a minimum of one for every 100 lin. ft. of fire lane - refer to Drawings. Coordinate exact quantity and locations with Fire Department Field Inspector.
 - 4. Locate signs 2 ft. inside curb line or edge of pavement.
 - a. Where the entire roadway width is a designated fire lane, post signs on both sides of the street/drive, facing traffic.
 - b. Size: 12 in. wide by 18 in. long.
 - c. Color: White background with 2 in. wide red border all sides.
 - d. Wording: 1 in. high red letters in center of white area: NO PARKING FIRE LANE.
 - e. Construction: Mount sign on galvanized steel post with 6 ft.-8 in. clear from bottom of sign to top of adjacent concrete curb or any adjacent paving.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Layout: Accurately layout work to maintain proper lines, levels and spacings.

3.2 INSTALLATION - PLASTIC SIGNS

- A. General: Press tape firmly to mounting surface, and secure each sign with 4 vandal-resistant screws, one screw at each corner, equidistant from the edges.
- B. Mounting location:
 - 1. General:
 - a. At heights and locations prescribed by Code.
 - b. As indicated on Drawings.
 - c. Multiple signs: Where more than one sign occurs in one area, group signs vertically, one above the other with 1/4 in. space between signs; field verify with Architect before installation.
 - 2. Mount the following signs on doors:
 - a. Toilet room: Figure/geometric symbol at 60 in. above finished floor to centerline of sign.

- b. Fire alarm signs: As field-directed by Architect.
- c. NOT AN EXIT signs: As indicated on drawings and as field-directed by Architect.
- 3. Mount following signs on walls:
 - a. Typical signs: Room name signs and room number signs at 60 in. above finished floor to centerline of sign and as indicated on drawings.
 - b. Building entrance: "ISA" symbol building entrance signs as indicated on drawings.
 - c. Toilet room wall: Combination "ISA" symbol and figure/geometric symbol signs as indicated on Drawings at 60 in. above finished floor to centerline of sign.
 - d. Room capacity signs: Mount on wall in visible location as indicated on drawings.

3.3 INSTALLATION - METAL SIGNS

- A. Typical: Attach signs securely to posts and set posts in concrete.
- B. GATES TO REMAIN OPEN: Attach signs securely to gate frame just above gate opening, and centered from left to right.

3.4 SCHEDULE - REQUIRED PLASTIC AND METAL SIGNS

- A. General: Certain signs are listed below. This list is not complete. Other signs may be shown on Drawings and details. Provide all signs required.
- B. List of signs:
 - 1. Room name and number signs: One sign for each doorway including both existing and new rooms/doorways; either a name sign or a number sign as directed by District.
 - a. Approximately 70% will be name signs.
 - 2. Fire alarm signs: One for each room containing a fire alarm station; mount on the exterior face of an exterior door to that room.
 - 3. Plastic accessibility symbol signs:
 - a. Toilet room door signs: One for each accessible toilet room.
 - b. Toilet room wall signs: One for each accessible toilet room.
 - c. Building entrance signs: Locate where indicated on Drawings.
 - 4. NOT AN EXIT sign: Locate where indicated on drawings.
 - 5. Metal accessibility symbol signs:
 - a. Accessible parking stall signs: Locate where indicated on Drawings.
 - b. Accessible path of travel/direction-to-building-entrance signs: Locate where indicated on Drawings.
 - 6. Metal accessible parking entrance signs, fire lane signs and gate signs: Locate where indicated on Drawings.

END OF SECTION

**SECTION 14 42 00
WHEELCHAIR LIFTS**

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Vertical platform lifts.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For each lift. Include plans, elevations, sections, details, and attachments to other work.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
2. Wiring Diagrams: For power, signal, and control wiring.

C. Samples: For each exposed product and for each color and texture specified.

D. Manufacturer Certificates: Signed by lift manufacturer certifying that runway, ramp or pit, and dimensions as shown on Drawings and that electrical service as shown and specified are adequate for lift being provided.

E. Inspection and acceptance certificates and operating permits.

F. Operation and maintenance data.

G. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Regulatory Requirements: In addition to requirements of authorities having jurisdiction, comply with ASME A18.1, "Safety Standard for Platform Lifts and Stairway Chairlifts."

1.4 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of lifts that fail in materials or workmanship within specified warranty period.

1. Warranty Period: **Two** years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Steel Tubing: ASTM A 500.
- C. Steel Pipe: ASTM A 53/A 53M; standard weight (Schedule 40) unless otherwise indicated or required by structural loads.
- D. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, commercial steel (CS), Type B, exposed, matte finish.
- E. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, commercial steel (CS), Type B, pickled.
- F. Galvanized-Steel Sheet: ASTM A 653/A 653M, G90 (Z275) zinc coating.
- G. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:
 - 1. ASTM A 123/A 123M, for galvanizing steel and iron products.
 - 2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.
- H. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of alloy and temper designated below for each aluminum form required:
 - 1. Extruded Aluminum: ASTM B 221 (ASTM B 221M), Alloy 6063-T6.
 - 2. Aluminum Sheet: ASTM B 209 (ASTM B 209M), Alloy 5005-H15.
- I. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.
- J. Stainless-Steel Tubing: ASTM A 554, Grade MT-304.
- K. Stainless-Steel Sheet, Strip, and Plate: ASTM A 240/A 240M or ASTM A 666, Type 304.
- L. Stainless-Steel Floor Plate: ASTM A 793.
- M. Glass: Comply with requirements in Division 8 Section "Glazing."
- N. Acrylic Glazing: ASTM D 4802, Category A-1 (cell-cast) or Category A-2 (continuous cast), Finish 1 (smooth or polished), clear or tinted as indicated.
- O. Inserts: Furnish required concrete and masonry inserts and similar anchorage devices for installing structural members, guide rails, machines, and other lift components where installation of devices is specified in another Section.
- P. Expansion Anchors: Anchor-bolt-and-sleeve assembly of material indicated below with capability to sustain a load equal to 10 times the load imposed as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
 2. Material: Group 1, Alloy 304 or Alloy 316, stainless-steel bolts and nuts complying with **ASTM F 593** (**ASTM F 738M**) and **ASTM F 594** (**ASTM F 836M**).
- Q. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.

2.2 VERTICAL PLATFORM LIFTS

- A. Vertical Platform Lifts: Manufacturer's standard preengineered lift systems as indicated.
1. Manufacturers: Subject to compliance with requirements, **provide products by one of the following:**
 - a. Garaventa Accessibility.
 - b. Inclinator Company of America.
 - c. Liftavator, Inc.
 - d. National Wheel-O-Vator Co., Inc. (The).
- B. Platform Size: **36 by 51 inches**.
- C. Door Operation and Clear Opening Width: Low-energy, power-operated doors that remain open for 20 seconds minimum; **end door with minimum 32-inch** clear opening width.
- D. Rated Speed: **18 fpm**.
- E. Power Supply: **120 V, 60 Hz, 1 phase**.
- F. Emergency Operation: Model-GVL-EN-96 provided with **emergency auxiliary battery power system** to raise or lower units in case of malfunction or power loss.
- G. Self-Supporting Units: Support vertical loads of units only at base, with lateral support only at landing levels.
- H. **Partial** Runway Enclosure: Manufacturer's standard enclosure assembly.
- I. Platform Enclosure and Door: Rectangular steel-tube frame with flush steel-sheet panels.
- J. Fixed Ramp: Provide fixed ramp matching platform to provide transition from floor to lift platform at bottom landing.

2.3 FINISHES

- A. Steel and Galvanized-Steel Factory Finish: Manufacturer's standard baked-enamel or powder-coat finish.
1. Color and Gloss: **As selected by Architect from manufacturer's full range**.
- B. Stainless-Steel Finishes:

1. Floor Plate Finish: **Abrasive blasted.**
2. Grab Rail Finish: **As selected by Architect from manufacturer's full range.**

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Wiring Method: Conceal conductors and cables within housings of units or building construction. Do not install conduit exposed to view in finished spaces.
- B. Coordinate runway doors with platform travel and positioning, for accurate alignment and minimum clearance between platforms, runway doors, sills, and door frames.
- C. Position sills accurately and fill space under sills solidly with nonshrink, nonmetallic grout.
- D. Coordinate platform doors with platform travel and positioning.
- E. Adjust stops for accurate stopping at each landing, within required tolerances.
- F. Adjust retractable ramps to meet maximum allowable slope and change-in-elevation requirements, and to lie fully against landing surfaces.
- G. Lubricate operating parts of lift, including drive mechanism, guide rails, hinges, safety devices, and hardware.

3.2 FIELD QUALITY CONTROL

- A. Acceptance Testing: On completion of lift installation and before permitting use of lifts, perform acceptance tests as required and recommended by ASME A18.1 and authorities having jurisdiction.
- B. Operating Test: In addition to above testing, load lifts to rated capacity and operate continuously for 30 minutes between lowest and highest landings served. Readjust stops, signal equipment, and other devices for accurate stopping and operation of system.

3.3 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain lifts. Include a review of emergency systems and emergency procedures to be followed at time of operational failure and other building emergencies.
- B. Check operation of lifts with Owner's personnel present and before date of Substantial Completion. Determine that operating systems and devices are functioning properly.
- C. Check operation of lifts with Owner's personnel present not more than one month before end of warranty period. Determine that operating systems and devices are functioning properly.

END OF SECTION

SECTION 27 51 23
ASSISTIVE LISTENING SYSTEM

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. Labor, material, equipment, supplies, labor, testing, and accessories required to furnish and install a complete Assistive Listening System (ALS) as indicated on the drawings and as specified herein.
 - 1. Provide portable receivers in quantities as required in the 2022 California Building Code. Quantity of receivers shall be two minimum and hearing-aid compatible.
 - 2. The Contractor shall comply with all requirements described in 2022 California Building Code Sections 11B-219 and 11B-706.
- B. It is the intent of the Drawings and Specifications for the Contractor to design, provide and install a complete, fully operational, and tested system.
- C. All miscellaneous system components shall be furnished and installed complete under this section, such that the system shall perform all functions listed herein in compliance with all of the specified requirements.
- D. The Assistive Listening System shall include, but not be limited to, the following subsystems and products:
 - 1. See Products Section.

1.02 RELATED WORK

- A. Documents affecting work of this section include, but are not necessarily limited to, General Conditions, Supplementary Conditions of these specifications.

1.03 GENERAL REQUIREMENTS

- A. The contractor shall hold a valid State of California C-7 Low-Voltage license, shall have completed at least 5 projects of equal scope, shall have been in business of furnishing and installing systems of this scope and magnitude for at least five years, and capable of being bonded to assure the owner of performance and satisfactory service during the guarantee period.
- B. The contractor shall hold all other licenses required by the legally constituted authorities having jurisdiction over the work.
- C. All work shall be performed under the supervision of a company accredited by the basic equipment manufacturer and such accreditation must be presented.
- D. The installing contractor shall be a factory authorized distributor and warrantee station for the brand of equipment offered and shall maintain a fully equipped service organization capable of furnishing adequate repair service to the equipment.
- E. All of the equipment in this specification shall be furnished and installed by the Authorized Factory Distributor of the equipment. The Contractor shall also furnish a written guarantee from the manufacturer that they will have a service representative assigned to this area for the life of the equipment.

1.04 QUALITY ASSURANCE

- A. In order to maintain a high degree of quality assurance, the Contractor shall, without exception, use the parts and supplies as specified on the drawings and in these specifications.
- B. For any proposed product substitution or when the Contractor intends to include an 'or equal' product in the bid pricing, provide a substitution request submittal to the Owners Project Manager for review no later than fifteen (15) calendar days prior to Bid submittal. This report shall include:
 - 1. Description of how the proposed product(s) will impact meeting the project completion date, indicate item(s) with lead times and expected delivery date(s).
 - 2. Itemized cost comparisons between the proposed product(s) and the listed product(s).
 - 3. Detailed technical analysis of the electrical and mechanical specification differences between the proposed product(s) and the listed product(s).
 - 4. ETL "Verified" or UL "Verified" test lab documentation for the proposed product(s), component(s) and assemblies.
 - 5. Proposed product identification, manufacturer literature (specifications and cut sheets).
 - 6. Name, address and contact information of several similar projects where the proposed product(s) have been used.
 - 7. Name, address and contact information of the proposed product(s) manufacturer's local representative.
 - 8. Sample proposed product(s) manufacturer's warranty.
- C. The Owners Design Team/Project Manager must approve any proposed product(s) substitution item in writing. The Owners Design Team/Project Manager reserves the right to require a complete sample of any proposed product(s) and may request a sample tested by an independent testing consultant to prove equality. The decision of the Owners Design Team/Project Manager regarding equality of proposed product(s) items will be final.
- D. It is a mandatory requirement that a single Contractor perform the work described in this specification.

1.04 SUBMITTAL AND MANUAL

- A. Requirements of this section are:
 - 1. The submission shall consist of five major sections with each section separated with index tabs. Each page in the submission shall be numbered chronologically and shall be summarized in the index.
 - 2. The first section shall be the "index" which shall include the project title and address, name of the firm submitting the proposal and name of the Architect.

3. The second section shall include a copy of the Contractors valid C-7 California State Contractors license, a list of 5 projects of equal or greater scope, and a list of proposed instrumentation to be used by the contractor. In addition, provide a written notice guarantying the provision of the requested warranty.
 4. The third section shall contain the comparative specification listing, including a complete listing of the characteristics of the equipment to be furnished next to all of the specified equipment's features and functions as stated in the specifications and data sheets.
 5. The fourth section shall contain an original factory data sheet for every component in the specifications.
 6. The fifth section shall contain a designation schedule for each Structured Cabling System location and complete 1/8"=1'-0" scaled drawings showing system wiring plans.
- B. Failure to comply with all of the requirements listed above will result in the rejection of the entire submittal package.
- C. The Contractor shall provide two copies of an "Operating and Servicing Manual" for the system. The manuals shall be bound in flexible binders. All data shall be printed material or typewritten. Each manual shall include the following: Instructions necessary for the proper operation and servicing of the system; complete as-built drawings of the system; a wiring destination schedule for each circuit leaving for each piece of equipment; a schematic diagram of major components with replacement number.

1.06 GENERAL SYSTEM PRODUCT WARRANTY

- A. Prior to Owner acceptance, the contractor shall provide to Owner, a manufacturer's product warranty. On behalf of the Owner, the contractor shall submit the required warranty registration form within ninety (90) days of Contractor's purchase. The Owner will only acknowledge acceptance upon submittal of a valid manufacturer's warranty.
- B. The warranty shall commence from the date of final written acceptance by the Owner.
- C. All conditions for obtaining the manufacturer's warranty shall be the sole responsibility of the contractor.
- D. The manufacturer shall warrant the transmitter and receivers to be free from defects in workmanship and material under normal use and conditions for the useful lifetime of the product from date of purchase. Useful lifetime is defined as five (5) years from date of purchase. All other products and accessories shall have a one (1) year limited warranty to be free from defects in workmanship and material under normal use and conditions from date of purchase.
- E. Any material showing mechanical or electrical defects shall be replaced promptly at no expense to the Owner.
- F. A typewritten notice shall be posted at the equipment rack(s) that shall indicate the firm, address and telephone number to call when service is necessary. The notice shall be mounted in a neatly finished metal frame with a clear plastic window and securely attached to the inside of the door.

1.07 ACCEPTABLE MANUFACTURERS

- A. Equipment listed herein will be by Listen Technologies; or equal.

- B. It is the responsibility of the bidder to insure that the proposed product meets or exceeds every standard set forth in these specifications and the equipment's technical data sheets.
- C. The functions and features specified are vital to the operation of this facility. Therefore, inclusion of a components manufacturer in the list of acceptable manufacturers does not release the contractor from strict compliance with the requirements of this specification.
- D. All basic electronic equipment (not including cable) specified herein shall be produced by a single manufacturer of established reputation and experience who shall have produced similar apparatus for at least three or more years and who shall be able to refer to similar installations rendering satisfactory service. It is the responsibility of the bidder to insure that the proposed product meets or exceeds every standard set forth in these specifications and the equipment's technical data sheets.

PART 2 – PRODUCTS

2.01 LISTEN TECHNOLOGIES 2 CHANNEL Wi-Fi AUDIO SERVER

- A. The audio over Wi-Fi server shall be capable of broadcasting 2 audio channels over Wi-Fi to devices including smart phones, tablets, and receivers. The devices shall be able to receive the audio channels being broadcast through a proprietary app. The app shall be made available for download to smart devices through the Apple and Android app stores or other web locations at no charge.
- B. The server shall be rack mountable in 1 RU 19" rack space, with no user control interface on the server to prevent tampering and facilitate easy setup and operation. The server shall accept both consumer RCA inputs and professional balanced inputs via terminal blocks, and there shall be audio input indication through LED's shown on the front panel of the server. The server shall have an external power supply with the appropriate line cord.
- C. The proprietary app shall have the ability to play venue intro videos or video ads. It shall be capable of showing sliding ad banners, URL hyperlinks, and PDF documents, which are customer supplied and supported. It shall be capable of timing ads based upon the time of day and day of the week. The user venue shall be able to customize the app with their own colors, logos and channel names. Channel selections shall allow customization with channel logos, images and colors.
- D. All app features shall be managed through a web application cloud service as well as have the capability to push updates to each server remotely. Each server shall be accessible through a local hosted web interface to manage server network configurations.
- E. The LW-100P-02 Listen EVERYWHERE 2 Channel Wi-Fi Audio Server is specified.

2.02 LISTEN TECHNOLOGIES LWR-1020-A1 Wi-Fi AUDIO RECEIVER 1020

- A. The device shall be a digital receiver operating in the 2.4 and 5 GHz unlicensed Wi-Fi bands allowing low latency streaming of audio from a Listen EVERYWHERE server across a local area network. The device shall be a provisioned smart phone, locked down and configured strictly for use as a Wi-Fi Audio Receiver, running the Listen EVERYWHERE mobile application with no other device services or applications being accessible. The device shall provide access to Wi-Fi network settings from the home screen. The device shall provide a method to pair Bluetooth devices from the home screen. Channel selection shall be made via the front panel touch display via the Listen EVERYWHERE application. The device shall provide easy to access volume control

using the side volume buttons.

- B. The device shall support encrypted and secure communications, employing pass code-protected private channels to ensure complete confidentiality in communication and streaming. It shall be powered via a non-removable rechargeable lithium-polymer battery. The device shall incorporate automatic battery charging circuitry to charge and maintain the lithium-polymer battery via the USB-C port on the device. The receiver shall have a 3.5 mm TRRS CTIA compliant headphone connection allowing operation with standard style headphones. It shall have a touch display with auto-dimming, allowing display of the Listen EVERYWHERE user interface as well as battery percentage, Wi-Fi signal strength, charging status, and volume adjustments.
 - C. The device shall support customizations to the user interface using a remote Cloud Services programming interface. The device shall support custom app themes and colors, channel names and logos, welcome video ads or logos, and in-app sliding banners.
 - D. The device shall have a signal-to-noise ratio of 74 dB or greater and shall have an audio frequency response of 20 Hz – 20 kHz (± 1 dB). The receiver shall have audio latency of less than 80mS.
 - E. The Listen EVERYWHERE LWR-1020 is specified. Provide quantity per 2022 CBC 11B ALS requirements.
- 2.03 Listen Technologies LA-511 Protective Case for LWR-120 Receiver. Provide quantity 1 per receiver.
- 2.04 Listen Technologies LA-438 Advanced Neck Loop, for wireless connection to hearing aids equipped with a 'T' coil. Provide quantity of 25% of total quantity of receivers.
- 2.05 Listen Technologies LA-164 Ear Speaker, over-the-ear design, single ear clip. Provide quantity 1per receiver.
- 2.06 Listen Technologies LA-424-01 2-Port USB-C charger. Provide quantity 1 per every 2 receivers.
- 2.07 Listen Technologies LA-304 Notification signage kits or as directed by Architect. See Architect drawings for quantity.

PART 3 – EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

- A. The wiring of the system shall be executed in accordance with the drawings and the equipment manufacture's wiring diagrams. Should any variations in these requirements occur, the contractor shall notify the architect before making any change. It shall be the responsibility of the factory-authorized distributor of the approved equipment to install the equipment and guarantee the system to operate as per plans and specifications.
- B. Furnish all materials and labor to install a complete and operable system.
- C. Clean all equipment and materials. Exposed parts of the equipment, cabinets, and other equipment shall be left in a clean condition, unblemished and free of all dirt, dust, smudges, spots, fingerprints, etc., remove debris and rubbish occasioned by the electronic systems work from the site.
- D. The system must meet all 2022 CBC code Assistive Listening Systems requirements.

- E. The system shall accommodate a minimum of 4 percent of the total number of seats in the required area.
- F. Contractor shall provide Assistive Listening System signage in the quantities and locations as indicated on the architectural drawings, and as required by 2022 CBC.
- G. Submit block diagram and as-built drawing of all equipment.

3.02 GENERAL TESTING REQUIREMENTS

- A. Provide instruments for testing and demonstrating in the presence of the owner's inspector a complete functioning system.

3.03 FINAL ACCEPTANCE

- A. The Owner or Owner's representative may visit the site during the installation of the system to ensure that correct installation practices are being followed.
- B. The Owner or Owner's representative will conduct a final job review once the contractor has finished the job. This review will take place within one week after the contractor notifies the owner.
- C. Two copies of all certification data and drawings for all identifications shall be provided to the Owner before the owner's review.
- D. The Owner or Owner's representative will review the installation and certification data prior to the system acceptance.
- E. The Owner or Owner's representative may test some of the system's features to ensure that the certification data is correct. If a substantial discrepancy is found, the Owner reserves the right to have an independent consultant perform a certification of the entire system. If such a procedure is undertaken, the cost of the testing will be billed back to the contractor.

END OF SECTION

SECTION 31 10 00 SITE CLEARING

PART 1 – GENERAL

1.01 SUMMARY

- A. This Section requires the selective removal and subsequent off-site disposal of the following:
 - 1. Removal and disposal of all abandoned pipe and conduit except for pipe or conduit indicated specifically on plans for abandonment in place.
 - 2. Removal and disposal of all abandoned pipe and conduit except for pipe or conduit indicated specifically on plans for abandonment in place.
 - 3. Removal and offsite disposal of grass and root mat.
 - 4. Demolition of asphalt concrete and pavements as indicated on the drawings to straight, neatly saw cut surface.
 - 5. Trees as indicated on plans, completed including roots.
 - 6. All other removals which may or may not been shown on plans as required for the project construction.

1.02 SITE CONDITIONS

- A. Protections: Contractor shall provide temporary barricades and other forms of protection to protect general public from injury due to demolition work.
- B. Traffic: Conduct demolition operations and debris removal to ensure minimum interference with roads, streets, walks, bike paths, and other adjacent occupied or used facilities. Access must be coordinated with District's Representative.
- C. Utility Services: Maintain all existing utilities to remain in service and protect them against damage during demolition operations.
- D. Environmental Controls: Use water sprinkling, temporary enclosures, and other methods to limit dust and dirt migration. Comply with governing regulations and County Air Pollution Control District pertaining to environmental protection. Do not use water when it may create hazardous or objectionable conditions such as flooding and pollution.

1.03 REFERENCES

- A. Standard Specifications for Public Works Construction (Green Book), latest edition.

PART 2 – PRODUCTS NOT USED

PART 3 – EXECUTION

3.01 DEMOLITION

- A. General: Perform demolition work in a systematic manner. Use such methods as required to complete work indicated on drawings in accordance with governing regulations.

- B. Provide services for effective air and water pollution controls as required by County Air Pollution Control District regulations.
- C. Prior to commencing grading operations, soil containing debris, organics, pavement, or other unsuitable materials, shall be stripped from the foundation and pavement areas. Demolition areas shall be cleared of old foundations, slabs, abandoned utilities, tree roots, and soil disturbed during the demolition process. Depressions or disturbed areas left from the removal of such material shall be replaced with compacted fill.
- D. Concrete sidewalks will be removed to the nearest construction or expansion joint to the limits of removal as shown on the plans. Exact locations will be determined in the field by the District's Representative.

3.02 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove from Project site debris, rubbish, and other materials resulting from demolition operations. Transport and legally dispose of off-site.
- B. If hazardous materials are encountered during demolition operations, contact District's Representative.
- C. Burning of removed materials is not permitted on project site.

3.03 HAZARDOUS MATERIALS

- A. Except as otherwise specified, in the event Contractor encounters on the Project site material reasonably believed to be asbestos, polychlorinated biphenyl (PCB), or other hazardous materials which have not been rendered harmless, Contractor shall immediately stop Work in the area affected and report the condition to the District's Representative in writing. The Work in the affected area shall not thereafter be resumed except by written agreement of the Contractor if in fact the material is asbestos, PCB, or other hazardous materials and has not been rendered harmless. The Work in the affected area shall be resumed in the absence of asbestos, PCB, or other hazardous materials, or when such materials have been rendered harmless.
- B. Construction involving asbestos cement (transite) pipe shall be performed by qualified personnel in accordance with the standards and specifications set forth by American Water Works Association (AWWA), the Occupational Safety and Health Act (OSHA) and the Environmental Protection Agency (EPA), as well as location jurisdictional codes.

3.04 CLEANUP AND REPAIR

- A. General: Upon completion of demolition work, remove tools, equipment and demolished materials from site.
 - 1. Repair demolition performed in excess of that required. Return elements of construction and surfaces to existing condition prior to start of operations. Repair adjacent construction or surfaces soiled or damaged by demolition work.

END OF SECTION

**SECTION 31 20 00
EARTHWORK**

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes: Excavation, Compaction and Fill.

1.02 REFERENCE

- A. Standard Specifications for Public Works Construction (SSPWC), latest edition.

1.03 QUALITY ASSURANCE

- A. Codes and Standards: Perform earthwork in compliance with applicable requirements of governing authorities having jurisdiction.
 - 1. Standard Specifications for Public Works Construction (SSPWC), latest edition.
 - 2. CAL/OSHA Construction Safety Order Requirements.
- B. Soil Testing Service
 - 1. The District will engage a soil testing service to include testing soil materials proposed for use in the Work and for quality control testing during grading operations.
 - 2. Samples of materials shall be furnished to the testing service by the Contractor at least one week before their anticipated use.
 - 3. Work for this Section includes smoothing out areas for density tests and otherwise facilitate testing work, as directed.
 - 4. Shoring Systems: Pre-engineered systems, clearly labeled as such, may be used.

1.04 PROJECT CONDITIONS

- A. The Contractor shall visit the site and familiarize himself with existing site conditions.
- B. Additional test borings and other exploratory operations may be made by the Contractor at no cost or liability to the District.
- C. Existing Utilities:
 - 1. Where uncharted or incorrectly charted piping or other utilities are encountered during excavation, consult District 's Representative immediately for directions. Cooperate with the District's Representative in keeping respective services and facilities in operation. Repair damaged utilities to the satisfaction of the District's Representative at no cost to the District. Disturbed trench sections shall be replaced in kind.
 - 2. Contractor to coordinate with the District 's Representative to obtain all required permits and schedule inspections.

- D. Protection of Subgrade: Do not allow equipment to pump, rut, or disturb subgrade, stripped areas, or other areas prepared for Project.
- E. Contractor shall implement measures to prevent soil erosion, and where possible, sediment shall be retained onsite.

PART 2 – PRODUCTS
NOT USED

PART 3 – EXECUTION

3.01 SITE PREPARATION

A. General:

1. Remove vegetation, improvements, or obstructions interfering with installation of new construction. Transport and legally dispose of off site. Removal includes stumps and roots. Contractor shall utilize the best construction method to minimize the erosive effect from the removal of site vegetation.
2. Carefully and cleanly cut roots and branches of trees indicated to be left standing, where such roots and branches obstruct new construction. Paint cuts over one inch in size with tree pruning compound. Care shall be taken so as not to scar any area of the tree's bark.
3. In order to protect from sediment transfer or contamination from urban run-off during construction, the following grading and erosion control practices shall be followed:
 - a. If grading occurs during the rainy season (November through April), sediment traps, barriers, covers or other methods shall be used to reduce erosion and sedimentation.
 - b. Excavated materials shall not be deposited or stored where the material can be washed away by high water or storm run-off.
 - c. Grading operations on site shall be conducted so as to prevent damaging effects of sediment production and dust on the site and on adjoining properties.
 - d. When vegetation has to be removed on site, the methods shall be one that minimizes the erosive effects from the removal.
 - e. Exposure of soil to erosion by removing vegetation shall be limited to the area required for construction operations. The construction area shall be fenced to define the project.
 - f. Temporary mulching, seeding, or other suitable stabilization shall be used to protect areas during construction or other land disturbance activities on site.
 - g. Topsoil, removed from the surface in preparation for grading and construction activities on Campus is to be stored on or near the site and protected from erosion while grading operations are underway, provided

that such storage may not be located where it would cause suffocation of root systems of trees to be preserved. After completion of such grading, topsoil is to be restored to exposed cut and fill embankments of building pads so as to provide a suitable base of seeding and planting.

- h. Sediment basins, sediment traps, or similar control measures shall be installed before extensive clearing and grading operations begin for site development.
- i. Water or dust palliatives shall be applied to exposed earth services as necessary to control dust emissions.
- j. Revegetation or stabilization of exposed earth surfaces shall take place as soon as possible.

B. Removals

- 1. Clear the site of trees, shrubs, and other vegetation, which is indicated to be removed.
- 2. Completely remove stumps, roots, and other debris to avoid problems with future utilities.
- 3. Use only hand methods for grubbing inside the drip line of trees indicated to be left standing.
- 4. Existing fills, soil containing debris, organics, pavement, or other unsuitable materials shall be excavated and removed prior to commencing grading operations. Demolition areas shall be cleared of old foundations, slabs, abandoned utilities, landscaping, and soils disturbed during the demolition process. Depressions or disturbed areas left from the removal of such material shall be replaced with compacted fill.
- 5. The limits and depths for removal of existing fill materials shall be evaluated by project soils engineer during grading.
- 6. Revegetation or stabilization of exposed earth surface shall take place as soon as possible.

C. Removal of Improvements

- 1. Remove above-grade and below-grade improvements necessary to permit construction and other work as indicated.
- 2. Remove from site and legally dispose of off-site, existing fill materials, soil debris, or other unsuitable materials prior to commencing grading operations.

3.02 EXCAVATION

- A. Excavation for Pavements: Cut surface under pavements to comply with cross-sections, elevations and grades as shown, within a tolerance of plus or minus 0.04 foot.
- B. Excavation for Planting Areas: Conform to cross-sections, elevations and dimensions shown, within a tolerance of plus or minus 0.10 foot.

3.03 COMPACTION

- A. General: Control soil compaction during construction providing minimum percentage of density specified for each area.
- B. Percentage of Maximum Density Requirements: Compact soil to not less than the percentages of maximum dry density in accordance with ASTM D1557-91 method of compaction.
- C. Moisture Control:
 - 1. When moisture content of exposed scarified soil and/or fill material is below that sufficient to achieve recommended compaction, water shall be added to the soil and/or fill. While water is being added, soil shall be bladed and mixed to provide relatively uniform moisture content throughout the material.
 - 2. When moisture content of exposed scarified soil and/or fill material is excessive, material shall be aerated by blading or other methods. Fill placed in pavement areas shall be compacted at near optimum moisture content. Jetting is not permitted for compaction.

3.04 FILL

- A. In all excavations, use satisfactory excavated or borrow material sampled and tested by the District's Testing Laboratory.
- B. Fill excavations as promptly as Work permits, but not until completion of the following:
 - 1. Acceptance by District's Representative of construction below finish grade including, where applicable, waterproofing, damp-proofing, and drainage pipe.
 - 2. Examination, testing, approval and recording locations of underground utilities.
 - 3. Removal of concrete formwork.
 - 4. Removal of shoring and bracing and backfilling of voids with satisfactory materials.
 - 5. Removal of trash and debris.
 - 6. Permanent or temporary horizontal bracing is in place on horizontally supported walls.
 - 7. Protect excavations by methods required to prevent cave-in or loose soil from falling into excavation.
- C. Continual dust control, as required by the District, and in accordance with County Air Pollution Control District's Standards shall be required for the project construction.

3.05 GRADING

- A. General: To provide support for building floor slabs, all existing fill and unsuitable natural soils shall be excavated and replaced as properly compacted fill.

- B. Compaction: After grading, compact subgrade surfaces to the depth and percentage of compaction for each area classification.
- C. Fill placement and grading operations shall be performed only under the observation of the District 's Testing Laboratory.
- D. The exterior grades around building areas shall be sloped to drain away from the buildings to prevent ponding of water adjacent to foundations.
- E. Grading operation shall be conducted so as to prevent damaging effects of sediment product and dust on the site and adjoining properties.

3.06 DISPOSAL OF EXCESS AND WASTE MATERIALS

- A. Transport excess excavated material and legally dispose of off-site.

3.07 FIELD QUALITY CONTROL

- A. Quality Control Testing During Construction: District 's Testing Laboratory will observe, test and approve subgrades and fill layers before further construction Work can be performed. The District's Representative will determine the frequency of tests. Subgrade: Allow at least one field density test of subgrade to be made for every 2000 sq. ft. of paved area, but in no case less than 3 tests.
- B. Field examination and testing will be performed by the District 's Testing Laboratory. The Contractor shall cooperate with such testing and shall give the District's Representative advance notice of grading scheduling.
- C. Frequency of Tests for Trenching: As determined by the District's Representative.
- D. If in the opinion of the District's Representative, based on soil testing reports and observations, subgrades or fills which have been placed are below specified density, provide corrective work as specified at no additional expense to the District, and pay for retesting of the soil.

3.08 PROTECTION

- A. Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
- B. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.
- C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, reshape, compact to required density and provide other corrective work as specified, with retesting, prior to further construction.

END OF SECTION

**SECTION 31 23 33
TRENCHING AND BACKFILLING**

PART 1 – GENERAL

1.01 SUMMARY

- A. Excavating trenches for construction of utilities.
- B. Trench backfill materials.
- C. Backfilling and compacting requirements.

1.02 REFERENCES

- A. Standard Specifications for Public Works Construction (SSPWC), latest edition.

1.03 SUBMITTALS

- A. Materials source.
- B. Sand equivalent test reports per ASTM D2419.
- C. Certificates.
- D. Drawings for shoring, bracing, sloping, or other provisions for worker protection for any excavation shall conform to the requirements of the CAL/OSHA Construction Safety Orders Requirements.

1.04 EXISTING UTILITIES

- A. Drawings show existing major underground utilities from reference drawings. Prior to excavation, the Contractor shall notify the District's Representative to obtain any additional information which may be applicable to the Work.
- B. Any incident of a utility being inadvertently damaged by the Contractor shall be immediately shutoff and then be immediately repaired by the Contractor at no cost to the District.
- C. Contractor to pothole all utility connections and verify exact size, location and material prior to beginning construction and notify engineer of any discrepancies.

PART 2 – PRODUCTS

2.01 APPROVALS

- A. Imported material shall be approved by the District's Representative prior to being brought to the site. Provide a sample of the material in sufficient quantity for the District's Representative's use in evaluating the material.

2.02 TRENCH BACKFILL MATERIAL

- A. Sand bedding shall have a sand equivalent (SE) of 30 or greater. The SE shall be evaluated during grading.
- B. Backfill material shall conform to the requirements of Section 217-2 of the SSPWC.

- C. Aggregate base course shall be per Plan.
- D. Topsoil removed from trenches shall be stockpiled at locations approved by the District's Representative.

2.03 SOURCE QUALITY CONTROL

- A. Inspection and testing shall be performed by the District's Representative.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Identify required lines, levels, contours, and datum.

3.02 TRENCH EXCAVATION

- A. All saw cutting shall be neat, straight cuts and shall conform to Section 306-3 of the SSPWC. All cuts shall be square unless otherwise specifically noted on plans.
- B. Trench excavation shall conform to Section 306-3 of the SSPWC and the following requirements:
 - 1. The bottom of the trench shall be graded and prepared to provide a firm and uniform bearing throughout the entire length of the pipe barrel. Suitable excavations shall be made to receive the bell of the pipe and the joint shall not bear upon the bottom of the trench. All adjustments to line and grade shall be made by scraping away or filling in with sand under the body of the pipe and not by wedging or blocking.
 - 2. If the trench is excavated below the required grade, correct any part of the trench excavated below the grade, at no additional cost to the District. Place the backfill material over the full width of trench in compacted layers not exceeding 6 inches deep to the established grade with allowance for the pipe base. If shoring is required, the trenches shall be shored and braced in accordance with the Trench Construction Safety Orders of the Division of Industrial Safety.
 - 3. When subgrade is encountered that in the opinion of the District's Representative is unsuitable for pipe support, the District's Representative may order the excavation to be carried to an approved depth below the bottom of the pipe and backfilled with sand, to the lines and grades shown on the drawings and specified by the District's Representative.
 - 4. The minimum width of the trench at the top of the pipe zone shall be as necessary to install the pipe. The utility lines shall be centered in the trench. In the event of (1) actual physical interference between existing crossing subsurface utilities and the proposed utility lines and (2) vertical discrepancy in connecting proposed utility lines to existing utility system, a minimum clearance of 0.5 feet between the utility line and the crossing, interfering utility shall be provided, unless otherwise indicated on the plans.
 - 5. Where existing utilities or tree roots are to be protected, trench excavation shall be by hand. No mechanical excavating equipment shall be used within 6 inches of any utility or root.
 - 6. Trenching machinery may be used for excavations provided the specified trench width can be maintained.

3.03 TRENCH BACKFILL

- A. Pipe bedding and trench backfill materials: Suitable imported pipe bedding for utilities shall consist of rock per SSPWC 217-1.2 for HDPE pipe or material having a sand equivalent of at least 30 for PVC pipe. The sand backfill material shall be placed within the pipe zone that extends from 6" below the bottom of the pipe to at least 12 inches above the top of the pipe for the full width of the trench. The horizontal distance between the spring line of the pipe and the side walls of the trench shall be such that bedding material can be properly placed and compacted below the haunches of the pipe. Pipe bedding and pipe zone backfill shall be compacted to at least 95 percent relative compaction.
- B. Trench backfill shall be per details on plan. Mechanical compaction of trench backfill shall be performed and water consolidation (jetting) methods of compaction shall not be permitted.
- C. Trench Backfilling shall conform to the requirements of Sections 306-12 of the SSPWC:
 - 1. During the process of laying pipe in trenches, sufficient material shall be carefully placed and hand tamped about the pipe to hold it firmly to established line and grade. Oversized material, broken rock or shale, if encountered, shall not be used for backfill.
 - 2. No motor driven mechanical compacting equipment shall be used over pipelines until the backfill has been compacted to 12 inches over the crown of the pipe.
 - 3. All backfill material shall be deposited in horizontal layers not exceeding the thickness specified in Section 306-12 of the SSPWC and not exceeding 8 inches in thickness. The distribution of materials shall be such that all material following compaction and consolidation will form a homogeneous mass free of voids, pockets, streaks or other imperfections. Backfilling shall be done with earth free from lumps, hardpan, chunks, paving material, organic matter or other deleterious substances.
 - 4. Jetting of bedding or backfill material to obtain specific moisture content or for compaction shall not be permitted. If encountered, existing fill in the utility excavation shall be excavated and recompacted or removed and replaced with new fill materials per requirements of Section 2.02.
 - 5. Compaction of all backfill material for trenches, pavements or structures, shall be per standard specifications for public works construction (SSPWC). Appropriate warning detector tape shall be placed over all utilities.
 - 6. Prior to final cleanup or resurfacing, the District's Representative shall take compaction tests in any backfill area and at any depth, with the Contractor providing equipment and operator to assist in such test. If any such compaction test fails, the Contractor shall correct such failure and pay for any retesting that is required. The District's Representative shall make as many tests as he feels is required to receive a satisfactory and acceptable job.

3.04 STOCKPILING

- A. Stockpiling of imported materials or excavated materials shall direct surface water away from approved stockpile site to prevent erosion.

B. After stockpiles are removed, leave area in a clean and neat condition.

3.05 FIELD QUALITY CONTROL

A. Inspection and testing shall be performed by District's Representative.

END OF SECTION

SECTION 32 12 16
ASPHALT CONCRETE PAVEMENT

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Work to be performed under this Section shall consist of all labor, materials, tools, equipment, transportation, and incidentals necessary to furnish and install, complete in place, asphalt concrete pavement improvements including backfill, saw cutting, asphalt concrete, and tack coat, and adjusting existing utilities to finish grade.
- B. Asphalt concrete pavement shall be performed in accordance with the Plans and the SSPWC Section 302-5, "Asphalt Concrete Pavement", and these specifications.
- C. All materials and procedures shall comply with the rules and regulations of the South Coast Air Quality Management District.

1.02 SHOP DRAWINGS AND SAMPLES

- A. The following shall be submitted in compliance with Section 01 33 00, Submittals.
 - 1. The Contractor shall formulate a job-mix formula using the Hveem Method in accordance with SSPWC Section 203-6.3 "Job Mix Formula (JBF) and Mix designs" and submit to the Engineer for approval. The resultant mixture shall have Hveem properties conforming to SSPWC Table 203-6.4.4.
 - 2. Certificates
 - a. Twenty days prior to the delivery of aggregates, asphalt materials, and paving mixes to the project site, the Contractor shall submit to the Engineer certificates and test results of compliance of such materials with these Specifications.
 - b. Where laboratory testing is specified herein, the Contractor shall employ an independent testing laboratory to conduct such tests and submit certificates of the test results.

PART 2 – PRODUCTS

2.01 ASPHALT CONCRETE MIX DESIGN

- A. Asphalt concrete to be used in paving shall comply with the following:
 - 1. Asphalt concrete shall comply with SSPWC Section 203 Type III C2 PG 64-10 with the following exceptions:
 - 2. The specified optimum binder content shall equal an air void content nearest 3.0% per CT 367 as modified by CT 309.
 - 3. The asphalt concrete mix design shall include 0.5% liquid antistrip.
- B. Asphalt concrete mixtures shall be installed in two (2) lifts.
 - 1. Base Lift: Varies in depth, Type "B" asphalt concrete, $\frac{3}{4}$ " maximum aggregate size, medium graded.
 - 2. Top Lift: Final 2 inches, Type "C2" asphalt concrete, $\frac{1}{2}$ " maximum aggregate size, medium graded.

2.02 TACK COAT

- A. The tack coat shall consist of emulsified asphalt, AASHTO M140 (ASTM D977) or AASHTO M208 (ASTM D2397) SS-1, SS-1h, CSS-1, or CSS-1h, diluted with one part water to one part emulsified asphalt.

PART 3 – EXECUTION

3.01 PAVEMENT REMOVAL

- A. Pavement within the project shall be removed within the limits of all construction excavations prior to excavation. Surplus material shall be removed and disposed of legally at an approved location offsite.
- B. Prior to removing existing surfacing, pavement cuts shall be made parallel with the proposed trench limits. All pavement cuts shall be neat and straight along both sides of the trench or excavation and parallel to its alignment. The strip of existing AC pavement between an excavation and a gutter face or edge of pavement shall be removed and replaced if less than 3 feet in width. Where large irregular surfaces are removed, such trimming or cutting shall be parallel to the roadway centerline or at right angles to the same.
- C. After backfilling and compaction, final pavement cuts shall be made by saw cutting (unless permit requirements supersede) to a minimum depth of 2 inches at a point not less than 12 inches outside the limits of excavation.
- D. The pavement cut operation shall be in accordance with SSPWC Section 300-1.3 "Removal and Disposal of Materials", and the Plans.
- E. The Contractor shall conduct operations so as not to damage the integrity of the edge of the pavement cut surface. Any damage to the pavement cut edge shall be corrected by the Contractor, as directed by the School District, by additional pavement cutting around the damaged area prior to the start of paving operations. Any additional pavement cutting required to correct the damaged edge shall be at the Contractor's expense.

3.02 ASPHALT CONCRETE PAVEMENT

- A. Asphalt concrete pavement shall be placed and compacted in accordance with SSPWC Section 302-5 Asphalt Concrete Pavement.

3.03 TACK COAT

- A. All vertical or horizontal hard surfaces, which will be in contact with new pavement, shall be tack coated in accordance with SSPWC Section 302-5.4 "Tack Coat", and at an approximate rate of 0.05 to 0.10 gallons per square yard.

3.04 DISTRIBUTION AND SPREADING

- A. The asphalt concrete shall be placed in accordance with SSPWC 302-5.5 "Distribution and Spreading."
- B. Asphalt course thickness shall match the existing pavement thickness plus one additional inch of thickness.

3.05 ROLLING

- A. The asphalt concrete shall be compacted in accordance with SSPWC 302-5.6 "Rolling."

3.06 REPAIRS

- A. Areas of new or existing asphalt concrete requiring repair shall be delineated by saw cutting and the asphalt concrete removed, then prime or tack coated, and paved with hot asphalt as specified herein.

3.07 CLEANUP

- A. Clean all debris and unused materials from the paving operation. Clean all surfaces that have been spattered or defaced as a result of the paving operation. Asphalt or asphalt stains which are noticeable upon surfaces of concrete or materials which will be exposed to view shall be promptly and completely removed. Cleaning shall be done in a manner that will not result in the discharge of contaminated materials into any catch basin or storm drain system.

END OF SECTION

**SECTION 32 16 00
CURBS, GUTTERS, SIDEWALKS**

PART 1 – GENERAL

1.01 SUMMARY

- A. Concrete for curbs, gutters, sidewalks.

1.02 RELATED SECTIONS

- A. Section 31 20 00 – Earthwork

1.03 REFERENCES

- A. Standard Specifications for Public Works Construction (SSPWC), latest edition.
- B. ASTM Standards.

1.04 SUBMITTALS

- A. Submit the following:
 - 1. Product Data: Provide data on admixtures and curing compounds.
 - 2. Concrete mix design(s).
 - 3. Certificates from the batch plant.

1.05 QUALITY ASSURANCE

- A. Perform Work in accordance with the SSPWC, latest edition; and ASTM Standards, latest edition.
- B. Obtain cementitious materials from same source throughout.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Do not place concrete when base surface temperature is less than 40 degrees F or surface is wet.

PART 2 – PRODUCTS

2.01 FORM MATERIALS

- A. Form Materials: Section 303-5 of the SSPWC.

2.02 CONCRETE MATERIALS

- A. Concrete Material for Curbs and Walks (Path of Travel):
 - 1. Class 520-C-2500. Portland cement concrete per Standard Specifications for Public Works Construction Section 201-1.
 - 2. Concrete reinforcements shall be constructed per the Project Plans and Specifications.

B. Concrete Material for Traffic Loaded Concrete:

1. Class 650-CW-4000. Portland cement concrete per Standard Specifications for Public Works Construction Section 201-1.
2. Concrete reinforcements shall be constructed per the Project Plans and Specifications.

2.03 ACCESSORIES

- A. Curing Compound shall conform to SSPWC Section 201-4. Pigmented compound shall not demonstrate any residual coloring of the concrete after one week.

2.04 CONCRETE MIX

- A. Mix and deliver concrete in accordance with ASTM C94.
- B. Use accelerating admixtures in cold weather only when approved by the District's Representative. Use of admixtures will not relax cold weather placement requirements.
- C. Use calcium chloride only when approved by the District 's Representative.
- D. Use set retarding admixtures during hot weather only when approved by the District 's Representative.

2.05 CONCRETE REINFORCEMENT

- A. Concrete reinforcement shall conform to SSPWC Section 201-2.

2.06 SOURCE QUALITY CONTROL

- A. Provide certificates of compliance from the batch plant.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify compacted subgrade is acceptable and ready to support imposed loads.
- B. Verify gradients and elevations of subgrade are correct.

3.02 PREPARATION

- A. Moisten subgrade to minimize absorption of water from fresh concrete.
- B. Coat surfaces of catch basin frames with oil to prevent bond with concrete pavement.
- C. Notify District's Representative a minimum of 24 hours prior to commencement of concrete placement operations.

3.03 FORMING

- A. Place and secure forms to correct location, dimension, and profile.
- B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.

- C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.04 PLACING CONCRETE

- A. Place concrete in accordance with SSPWC Section 303-5.
- B. Install ½" thick fiberboard expansion joint and snap cap. Seal with Sikaflex self-leveling sealant after removal of snap cap (typical).
- C. Construct weakened plane joints conforming to SSPWC Section 303-5.4.3, 1 ¼" inch deep, at intervals not exceeding 12 feet.
- D. The top edges of curbs shall have 0.5" radius.

3.05 FINISHING

- A. Concrete finishes shall be per SSPWC Section 303-5.5.
- B. Portland cement concrete paving in all accessible routes of travel shall have non-slip finish.
- C. Walkway grades in excess of 5% shall conform to requirements of Section 11B-401 of the latest edition of the California Building Code.
- D. Place curing compound in accordance with SSPWC Section 303-5.6 on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

3.06 FIELD QUALITY CONTROL

- A. Inspection and testing shall be performed by the District's Testing Laboratory.
- B. District 's Testing Laboratory will perform slump and compressive strength tests.
- C. Contractor shall maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.07 PROTECTION

- A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, vandalism and mechanical injury.
- B. It is the Contractor's responsibility to replace all concrete work subject to vandalism and graffiti at no extra cost to the District.

END OF SECTION

**SECTION 33 40 00
STORM DRAINAGE UTILITIES**

PART 1 - GENERAL

1.01 SUMMARY

- A. Storm drainage piping, fittings, accessories, and bedding.
- B. Catch basins.
- C. Manholes.
- D. Inlet and outlet structures.

1.02 RELATED SECTIONS

- A. Section 31 20 00 Earthwork.
- B. Section 31 23 33 Trenching and Backfilling.

1.03 REFERENCES

- A. Standard Specifications for Public Works Construction (SSPWC), latest edition.
- B. ASTM Standards.

1.04 SUBMITTALS

- A. Submit the following in accordance with provisions in Division 1:
 - 1. Product Data: Provide data indicating pipe, pipe accessories and catch basin grates.
 - 2. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.
 - 3. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
 - 4. Layout diagram for storm drain components per plan.

1.05 PROJECT RECORD DOCUMENTS

- A. Submit record drawings. Accurately record locations of pipe runs, connections, catch basins, structures, manholes and invert elevations.
- B. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.06 FIELD MEASUREMENTS

- A. Verify that field measurements and elevations are as indicated on drawings.
- B. Complete pothole work per plans and notify the District of any discrepancy prior to commencing construction.

1.07 COORDINATION

- A. Coordinate the work with connection to existing storm drain mains, and trenching.

PART 2 – PRODUCTS

2.01 PIPE MATERIALS

- A. Polyvinyl Chloride (PVC) Pipe, SDR 35 with water tight joints, per SSPWC Section 207-17.

2.02 PIPE ACCESSORIES

- A. Elastomeric Gasket water tight joints per SSPWC Section 207-17.3.2.

2.03 CATCH BASINS AND MANHOLES

- A. Precast catch basins shall include grate, as manufactured by Brooks Precast or approved equal.

2.04 METAL

- A. All exposed metal parts are to be galvanized in accordance with SSPWC, Section 210-3.

2.05 CONCRETE

- A. All concrete shall be Class 560-C-3250, per SSPWC Section 201.

2.06 BEDDING MATERIALS

- A. Refer to Specification Section 31 23 33 Trenching and Backfilling for Bedding Material.

2.07 FILTER FABRIC

- A. Filter fabric shall be non-woven geotextile filter fabric Mirafi 140N or approved equal.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify that trench cut is ready to receive Work and excavations, dimensions, and elevations are as indicated on Drawings.

3.02 PREPARATION

- A. Hand trim excavations to required elevations. Correct over excavation with compacted bedding material.
- B. Remove large stones or other hard matter which could damage piping or impede consistent backfilling or compaction.

3.03 BEDDING

- A. Excavate pipe trench in accordance with Specification Section 31 23 33. Hand trim excavation for accurate placement of pipe to elevations indicated on Drawings.
- B. Place bedding material in trench bottom, level materials in continuous layer. Bedding shall be 4" thickness for pipe diameters less than or equal to 24" and 6" thickness for pipe diameters greater than 24" and shall be per SSPWC Section 217-1.2.

3.04 INSTALLATION – PIPE

- A. Install pipe, fittings, and accessories in accordance with manufacturer's instructions and per SSPWC Section 207.
- B. Lay pipe to slope gradients noted on drawings; with maximum variation from true slope of 1/8 inch in 10 feet.
- C. Install backfill along sides and over top of pipe. Provide backfill over top of pipe to minimum compacted thickness of 12 inches, compacted to a minimum of 95 percent of maximum dry density.
- D. Refer to Specification Section 31 23 33 for Trenching Requirements. Do not displace or damage pipe when compacting.
- E. The compaction of the backfill material along the sides and one foot above the pipe shall be done with hand tampers or equal to protect the pipe.

3.05 INSTALLATION - CATCH BASINS, MANHOLES

- A. Form bottom of excavation clean and smooth to correct elevation.
- B. Form and place cast-in-place concrete base with provisions for storm drainage pipe end sections.
- C. Level top surface of concrete base to receive shaft sections.
- D. Establish elevations and pipe inverts for inlets and outlets as indicated on drawings.
- E. Compact top 12" of native materials below the bottom of catch basins and manholes to minimum 95 percent of maximum dry density.

3.06 FIELD QUALITY CONTROL

- A. Inspection and testing shall be performed by the District's representative.
- B. Request inspection prior to and immediately after placing backfill cover over pipe.
- C. If tests indicate work does not meet specified requirements, remove work, replace and retest at no cost to the District.

3.07 PROTECTION

- A. Protect pipe and backfill cover from damage or displacement until backfilling operation is in progress.

END OF SECTION