

**BUILDING 3000
MAINTENANCE,
OPERATIONS, WAREHOUSE
& GARAGE**
CHABOT COLLEGE

Project Manual
Volume 1 of 2
Divisions 00 thru 33

**DSA SPC_V2
DSA 01-121159
JUNE 5, 2024**

HGA

Hammel, Green and Abrahamson, Inc.
405 14th Street, Suite 500
Oakland, California 94612
510.516.0167

Project No. 4952-002
© 2024 HGA, Inc.

DOCUMENT 00 01 07

SEALS PAGE

ARCHITECT:

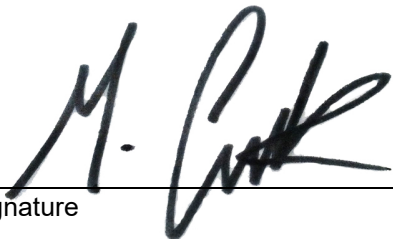
Matt Combrink
Brick, Inc.
405 14th street, suite 500
oakland, ca 94612

LICENSE NUMBER:

C-31415

Seal





Signature

08/29/2023

Date

DOCUMENT 00 01 07

SEALS PAGE

ENGINEER:

Angela M. Sommer
ZFA Structural Engineers
601 Montgomery Street, Suite 1450
San Francisco, CA 94111

LICENSE NUMBER:

S-6013

Seal



Angie Sommer

8/28/2023

Signature

Date

DOCUMENT 00 01 07


SEALS PAGE

ENGINEER: Michael Kuykendall
Sandis
636 9th Street
Oakland, CA 94607

LICENSE NUMBER: **C-70870**

Seal





Signature

8 / 28 / 2023

Date

DOCUMENT 00 01 07

SEALS PAGE

LANDSCAPE ARCHITECT:

Casey Case
Gates + Associates
1655 N Main St STE 365, Walnut Creek, CA 94596

LICENSE NUMBER:

6032



Signature

8/29/2023

Date

MECHANICAL ENGINEER:

Shawn MacLean
Interface Engineering, Inc.
49 Stevenson Street, Suite 660
San Francisco, CA 94105

LICENSE NUMBER:

M34857



Signature

8/29/2023

Date

ELECTRICAL ENGINEER:

Shane McCarthy
Interface Engineering, Inc.
49 Stevenson Street, Suite 660
San Francisco, CA 94105

LICENSE NUMBER:

E23849



Signature

8/29/2023

Date

PLUMBING ENGINEER:

Shawn MacLean
Interface Engineering, Inc.
49 Stevenson Street, Suite 660
San Francisco, CA 94105

LICENSE NUMBER:

M34857



Signature

8/29/2023

Date

DOCUMENT 00 01 07

SEALS PAGE

FIRE PROTECTION ENGINEER:

Shawn MacLean
Interface Engineering, Inc.
49 Stevenson Street, Suite 660
San Francisco, CA 94105

LICENSE NUMBER:

M34857



Signature

8/29/2023

Date

FIRE ALARM ENGINEER:

Shane McCarthy
Interface Engineering, Inc.
49 Stevenson Street, Suite 660
San Francisco, CA 94105

LICENSE NUMBER:

E23849



Signature

8/29/2023

Date

DOCUMENT 00 01 07

SEALS PAGE

ENGINEER:

Derek Lawson
Thorburn Associates
2500 Gateway Centre Blvd, Suite 800,
Morrisville, NC 27560

CERTIFICATION NUMBER:

#405409



DEREK LAWSON
CERT #405409

Derek Lawson

Signature

08/28/2023

Date

END OF DOCUMENT

	SECTION 00 0010 - TABLE OF CONTENTS		
	CONSULTANT ABBREVIATIONS		
	HGA	HGA	
	ZFA	ZFA	
	SD	SANDIS	
AUTHOR	GT	GATES	
	STO	STO	
	IEI	INTERFACE	
	TB	THORBURN	
	VOLUME 1		
	GENERAL REQUIREMENTS SUBGROUP		
	Introductory Information		
	Document 00 00 00	Cover Page	X
	Document 00 01 07	Seals Page	
	Document 00 01 10	Table of Contents	X
	Division 00 Procurement and Contracting Requirments		
		Bidding Requirements	X
	Division 01 General Requirements		
	Section 01 10 00	Summary of Work	X
	Section 01 26 00	Contract Modification Procedures	X
	Section 01 31 00	Project Coordination	X
	Section 01 31 19	Project Meetings	X
	Section 01 32 00	Progress Schedules and Reports	X
	Section 01 32 33	Photographic Documentation	X
	Section 01 33 00	Submittal Procedures	X
	Section 01 41 00	Regulatory Requirements	X
	Section 01 41 10	Regulatory Requirements - Hazardous Waste	X
	Section 01 42 00	References and Definitions	X
	Section 01 45 00	Quality Control	X
	Section 01 50 00	Temporary Facilities	X
STO	Section 01 57 21	Indoor Air Quality Controls	X
	Section 01 61 00	Material and Equipment	X
	Section 01 62 00	Product Options and Substitutions	X
	Section 01 70 00	Contract Closeout	X
	Section 01 73 29	Cutting and Patching	X
STO	Section 01 74 19	Construction Waste Management	X
	Section 01 78 00	Project Records Documents	X
STO	Section 01 81 13	Sustainability	X
	Section 01 91 13	General Commissioning Requirements	X

DSA SPC_V2 06/05/2024

	FACILITY CONSTRUCTION SUBGROUP		
	Division 02 Existing Conditions		
HGA	Section 02 41 19	Selective Demolition	X
	Division 03 Concrete		
	Section 03 10 00	Concrete Forming and Accessories	X
	Section 03 20 00	Concrete Reinforcing	X
	Section 03 30 00	Cast-in-Place Concrete	X
HGA	Section 03 55 43	Polished Concrete Finishing	X
	Division 04 Masonry		
	Section 04 20 00	Concrete Unit Masonry	X
	Division 05 Metals		
	Section 05 12 00	Structural Steel Framing	X
HGA	Section 05 12 13	Architecturally Exposed Structural Steel Framing	X
	Section 05 30 00	Metal Decking	X
	Section 05 40 00	Cold-Formed Metal Framing	X
HGA	Section 05 50 00	Metal Fabrications	X
HGA	Section 05 51 00	Metal Pan Stairs	X
HGA	Section 05 52 13	Pipe and Tube Railings	X
	Division 06 Wood, Plastics, and Composites		
HGA	Section 06 10 53	Miscellaneous Rough Carpentry	X
HGA	Section 06 16 00	Sheathing	X
HGA	Section 06 40 23	Interior Architectural Woodwork	X
HGA	Section 06 64 00	Plastic Paneling	X
	Division 07 Thermal and Moisture Protection		
HGA	Section 07 13 26	Sheet Waterproofing	X
HGA	Section 07 21 00	Thermal Building Insulation	X
HGA	Section 07 25 00	Weather Barriers	X
HGA	Section 07 26 10	Underslab Vapor Retarder	X
HGA	Section 07 26 16	Concrete Vapor Treatment	X
HGA	Section 07 41 13.16	Standing-Seam Metal Roofing	X
HGA	Section 07 42 13	Metal Wall Panels	X
HGA	Section 07 46 46	Cementitious Wall Panels	X
HGA	Section 07 54 19	Single Ply Roofing	X
HGA	Section 07 62 00	Sheet Metal Flashing and Trim	X
HGA	Section 07 72 60	Roof Fall Protection	X
HGA	Section 07 84 43	Joint Firestopping	X
HGA	Section 07 92 00	Joint Sealants	X

	Division 08 Openings		
HGA	Section 08 11 13	Hollow Metal Doors and Frames	X
HGA	Section 08 14 16	Flush Wood Doors	X
HGA	Section 08 31 13	Access Doors and Frames	X
HGA	Section 08 36 00	Overhead Sectional Doors	X
HGA	Section 08 41 13	Aluminum-Framed Storefronts	X
HGA	Section 08 51 13	Aluminum Windows	X
HGA	Section 08 71 00	Door Hardware	X
HGA	Section 08 80 00	Glazing	X
	Division 09 Finishes		
HGA	Section 09 21 00	Gypsum Board Assemblies	X
HGA	Section 09 22 16	Non-Structural Metal Framing	X
HGA	Section 09 24 23	Portland Cement Plaster	X
HGA	Section 09 30 00	Tiling	X
HGA	Section 09 51 13	Acoustical Tile Ceilings	X
HGA	Section 09 61 20	Concrete Floor Sealer	X
HGA	Section 09 65 13	Resilient Base and Accessories	X
HGA	Section 09 65 19	Resilient Tile Flooring	X
HGA	Section 09 68 13	Tile Carpeting	X
HGA	Section 09 72 00	Wallcoverings	
HGA	Section 09 91 00	Painting and Coating	X
HGA	Section 09 96 10	High Performance Coatings	X
	Division 10 Specialties		
HGA	Section 10 14 00	Signage	X
	Section 10 14 19	Dimensional Letters	X
HGA	Section 10 21 13	Toilet Compartments	X
HGA	Section 10 26 00	Wall Protection	X
HGA	Section 10 28 13	Toilet Accessories	X
HGA	Section 10 44 00	Fire Extinguishers and Cabinets	X
HGA	Section 10 51 13	Metal Lockers	X
HGA	Section 10 59 10	Aluminum Counter Supports	X
HGA	Section 10 81 13	Bird Control Devices	X
	Division 11 Equipment		
HGA	Section 11 30 13	Pantry Appliances	X
	Division 12 Furnishings		
HGA	Section 12 36 00	Solid Surfacing Fabrications	X
	Division 14 Conveying Equipment		
	Section 14 21 00	Electric Traction Elevators	X

VOLUME 2			
Division 21 Fire Suppression			
Section 21 00 00	Fire Suppression Basic Requirements		X
Section 21 05 00	Common Work Results for Fire Suppression		X
Section 21 13 00	Fire Suppression Sprinkler Systems		X
Division 22 Plumbing			
Section 22 00 00	Plumbing Basic Requirements		X
Section 22 05 23	General-Duty Valves for Plumbing Piping		X
Section 22 05 29	Hangers and Supports for Plumbing Piping and Equipment		X
Section 22 05 53	Identification for Plumbing Piping and Equipment		X
Section 22 07 00	Plumbing Insulation		X
Section 22 08 00	Commissioning of Plumbing		X
Section 22 10 00	Plumbing Piping		X
Section 22 15 00	General Service Compressed-Air Systems		X
Section 22 30 00	Plumbing Equipment		X
Section 22 40 00	Plumbing Fixtures		X
Division 26 Heating, Ventilating, and Air Conditioning (HVAC)			
Section 23 00 00	Heating, Ventilating and Air Conditioning (HVAC) Basic Requirements		X
Section 23 05 13	Common Motor Requirements for HVAC Equipment		X
Section 23 05 19	Meters and Gauges for HVAC Piping		X
Section 23 05 23	General-Duty Valves for HVAC Piping		X
Section 23 05 29	Hangers and Supports for HVAC Piping, Ductwork and Equipment		X
Section 23 05 33	Heat Tracing for HVAC Piping		X
Section 23 05 48	Vibration and Seismic Controls for HVAC Equipment		X
Section 23 05 53	Identification for HVAC Piping, Ductwork and Equipment		X
Section 23 05 93	Testing, Adjusting, and Balancing for HVAC		X
Section 23 07 00	HVAC Insulation		X
Section 23 08 00	Commissioning of HVAC		X
Section 23 09 00	Instrumentation and Control Performance Specifications		X
Section 23 21 13	HVAC Piping		X
Section 23 21 16	Hydronic Piping Specialties		X
Section 23 31 00	HVAC Ducts and Casings		X
Section 23 33 00	Air Duct Accessories		X
Section 23 34 00	HVAC Fans		X
Section 23 35 13	Dust Collection Systems		X
Section 23 36 00	Air Terminal Units		X
Section 23 37 00	Air Outlets and Inlets		X
Section 23 40 00	HVAC Air Cleaning Devices		X
Section 23 62 01	Variable Refrigerant Flow_Volume (VRF_VRV) Systems		X
Section 23 72 23	Packaged Air-to-Air Energy Recovery Units		X
Section 23 73 13	Modular Central Station Air-Handling Units		X
Section 23 81 26	Small Split System and Unitary HVAC Equipment		X
Section 23 82 00	Terminal Heat Transfer Equipment		X
Division 26 Electrical			
Section 26 00 00	Electrical Basic Requirements		X
Section 26 05 09	Equipment Wiring		X
Section 26 05 13	Medium-Voltage Cables		X
Section 26 05 19	Low-Voltage Electrical Power Conductors and Cables		X
Section 26 06 26	Grounding and Bonding for Electrical Systems		X
Section 26 05 29	Hangers and Supports for Electrical Systems and Equipment		X
Section 26 05 33	Raceways		X

	Section 26 05 34	Boxes	X	
	Section 26 05 43	Electrical Vaults and Underground Raceways	X	
	Section 26 05 53	Identification for Electrical Systems	X	
	Section 26 05 73	Electrical Distribution System Studies	X	
	Section 26 08 00	Commissioning of Electrical	X	
	Section 26 08 05	Electrical Acceptance Testing	X	
	Section 26 08 10	Building Lighting Acceptance Testing and Documentation	X	
	Section 26 09 25	Digital Lighting Controls	X	
	Section 26 12 00	Medium-Voltage Transformers	X	
	Section 26 22 00	Low-Voltage Transformers	X	
	Section 26 24 13	Switchboards	X	
	Section 26 24 16	Panelboards	X	
	Section 26 27 26	Wiring Devices	X	
	Section 26 28 00	Overcurrent Protective Devices	X	
	Section 26 28 16	Enclosed Switches and Circuit Breakers	X	
	Section 26 32 13	Engine Generators	X	
	Section 26 36 00	Transfer Switches	X	
	Section 26 51 00	Lighting	X	
	Division 27 Communications			
	Section 27 10 00	Structured Cabling	X	
	Section 27 41 16	Audiovisual Systems	X	
	Division 28 Electronic Safety and Security			
	Section 28 00 01	Electronic Safety Basic Requirements	X	
	Section 28 05 00	IESS	X	
	Section 28 31 00	Fire Detection and Alarm	X	
	Division 31 Excavation Support and Protection			
	Section 31 10 00	Site Preparation and Demolition	X	
	Section 31 22 00	Earthwork and Grading	X	
	Section 31 23 33	Trenching, Backfilling and Compacting	X	
	Division 32 Exterior Improvements			
	Section 32 12 33	Paving and Surfacing	X	
	Section 32 17 23	Pavement Marking	X	
HGA	Section 32 31 00	Slide Gate	X	
	Section 32 50 00	Restoration of Surfaces	X	
	Section 32 84 00	Standard Irrigation	X	
	Section 32 90 00	Standard Planting	X	
	Division 33 Utilities			
	Section 33 10 00	Water Systems	X	
	Section 33 30 00	Sanitary Sewer	X	
	Section 33 40 00	Storm Drainage	X	
	Section 33 47 27	Bioretention	X	
	END OF TABLE OF CONTENTS			

BIDDING REQUIREMENTS

TABLE OF CONTENTS

Description
Notice Calling for Bids
Instructions for Bidders
Subcontractors List
Non-Collusion Affidavit
Statement of Bidder's Qualifications
Bid Bond
Certification of Pre-Bid Site Visit
Bid Proposal
Agreement
Performance Bond
Payment Bond
Worker's Compensation Certification
Drug-Free Workplace Certificate
General Conditions
Special Conditions Attachment A – Change Order Form Attachment B – Asbestos and Other Hazardous Materials Certification Attachment C – Debris Recycling Statement Attachment D – Public Works Contractor Registration Certification Attachment E – Escrow Agreement in Lieu of Retention
Guarantee
Project Labor Agreement for Chabot-Las Positas College District (If Required – See PPM)

THIS PAGE INTENTIONALLY BLANK

NOTICE TO CONTRACTORS CALLING FOR BIDS

DISTRICT	CHABOT-LAS POSITAS COMMUNITY COLLEGE DISTRICT
PROJECT DESCRIPTION	BID NO.: XXXXX Name of Project Here
LATEST TIME/DATE FOR RFI'S SUBMITTALS	Date & Time
LATEST TIME/DATE FOR SUBMISSION OF BIDS PROPOSALS	Date & Time
LOCATION FOR SUBMISSION OF BID PROPOSALS	Chabot-Las Positas Community College District 7600 Dublin Blvd., Dublin, CA 94568 Attn: Marie Hampton, Purchasing and Warehouse Manager
LOCATION FOR OBTAINING BID AND CONTRACT DOCUMENTS	District Website at: http://www.clpccd.org/business/open.php

NOTICE IS HEREBY GIVEN that the above-named California Community College District, acting by and through its Board of Trustees, hereinafter “the District” will receive up to, but not later than the above-stated date and time, sealed Bid Proposals for the Contract for the Work of the Project generally described as: **BID NO.: XXXXX Name of Project Here, College**

1. Submittal of Bid Proposals. All Bid Proposals shall be submitted on forms furnished by the District. Bid Proposals must conform with, and be responsive to, the Bid and Contract Documents, copies of which may be obtained from the District’s website as set forth above. Only Bid Proposals submitted to the District at or prior to the date and time set forth above for the public opening and reading of Bid Proposals shall be considered.

2. Bid and Contract Documents. The Bid and Contract Documents are available at the District’s website at: <http://www.clpccd.org/business/open.php> under Bid No. **XXXXX Name of Project Here, College**

3. Documents Accompanying Bid Proposal. Each Bid Proposal shall be accompanied by: (a) the required Bid Security (b) Subcontractors List (c) Non-Collusion Affidavit (d) Certification of Pre-Bid Site Visit (e) Statement of Bidder’s Qualifications and (f) Public Works Contractor Registration Certification Form. All information or responses of a Bidder in its Bid Proposal and other documents accompanying the Bid Proposal shall be complete, accurate and true incomplete, inaccurate or untrue responses or information provided therein by a Bidder shall be grounds for the District to reject such Bidder’s Bid Proposal for non-responsiveness.

4. Prevailing Wage Rates. Pursuant to California Labor Code §1773, the Director of the Department of Industrial Relations of the State of California has determined the generally prevailing rates of wages in the locality in which the Work is to be performed. Copies of these determinations, entitled “PREVAILING WAGE SCALE” are filed at the District’s Administrative Offices located at 7600 Dublin Blvd., 3rd Floor, Dublin, CA 94568, and are available to any interested party upon request. Alternatively, prevailing wage rate classifications and determinations may be viewed and obtained by accessing the Division of Labor Standards Enforcement databases at <http://www.dir.ca.gov/dirdatabases.html>. The

Contractor awarded the Contract for the Work shall post a copy of all applicable prevailing wage rates for the Work at conspicuous locations at the Site of the Work. The Contractor and all Subcontractors performing any portion of the Work shall pay not less than the applicable prevailing wage rate for the classification of labor provide by their respective workers in prosecution and execution of the Work.

5. Contractors License Classification. In accordance with the provisions of California Public Contract Code §3300, the District requires that Bidders possess the following classification(s) of California Contractors License A and/or B. Any Bidder not so duly and properly licensed shall be subject to all penalties imposed by law. No payment shall be made for work, labor, materials or services provided under the Contract for the Work unless and until the Registrar of Contractors verifies to the District that the Bidder awarded the Contract is properly and duly licensed to perform the Work.

6. Contract Time. The date(s) for completion of portions of the Work, if applicable, and for achieving Substantial Completion of the Work shall be achieved as set forth in the Special Conditions. Failure to complete designated portions of the Work within the time(s) established in the Special Conditions and/or failure to achieve Substantial Completion of the Work within the Contract Time established in the Special Conditions shall subject the Contractor to assessment of Liquidated Damages as set forth in the Special Conditions.

7. Labor Compliance Program (AB 1506). The District has established a Labor Compliance Program ("LCP") pursuant to Labor Code §1771.5. The Contractor awarded the Contract for the Work shall comply with the LCP and provisions of the Contract Documents relating to implementation, compliance with, and enforcement of the LCP. This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

8. Bid Security. Each Bid Proposal shall be accompanied by Bid Security in an amount not less than ten percent (10%) of the maximum amount of the Bid Proposal, inclusive of any additive Alternate Bid Item(s). Failure of any Bid Proposal to be accompanied by Bid Security in the form and in the amount required shall render such Bid Proposal to be non-responsive and rejected by the District.

9. No Withdrawal of Bid Proposals. Bid Proposals shall not be withdrawn by any Bidder for a period of sixty (60) days after the opening of Bid Proposals. During this time, all Bidders shall guarantee prices quoted in their respective Bid Proposals.

10. Job-Walk. The District will conduct a **Mandatory Job Walks**. Job walk number one will be held on **DATE beginning at 10:00 AM. Bidders must attend job walk.** Bidders are to meet at **College Name, Location with Address where Bid Walk is being held, Bidders must attend the Site Walk to be eligible to participate in the bid.** Campus maps are available at insert map location here www.laspositascollege.edu/. The Job Walk is mandatory. If a Bid Proposal is submitted by a Bidder whose representative(s) did not attend the entirety of the Mandatory Job Walk, such bid will be rejected by the District as being non-responsive.

11. Substitute Security. In accordance with the provisions of California Public Contract Code §22300, substitution of eligible and equivalent securities for any monies withheld by the District to ensure the Contractor's performance under the Contract will be permitted at the request and expense of the Contractor and in conformity with California Public Contract Code §22300. The foregoing notwithstanding, the Bidder to whom the Contract is awarded shall submit its written request to the District to permit the substitution of securities for retention under California Public Contract Code §22300 prior to the submission of its first Application for Progress Payment. The failure of such Bidder to make such written request to the District prior to submission of its first Application for Progress Payment shall be deemed a waiver of the Bidder's rights under California Public Contract Code §22300.

12. Waiver of Irregularities. The District reserves the right to reject any or all Bid Proposals or to waive any irregularities or informalities in any Bid Proposal or in the bidding.

13. Award of Contract. The Contract for the Work, if awarded, will be by action of the District's Board of Trustees to the responsible and responsive Bidder submitting the lowest priced Bid Proposal. If Alternate Bid Items are included in the bidding, the lowest total priced Bid Proposal will be determined on the basis of the Base Bid Proposal (only) in accordance with the applicable provisions of the Instructions for Bidders.

**CHABOT-LAS POSITAS COMMUNITY COLLEGE
DISTRICT**

Publication Dates:

DATES AD 1 & 2 He

ADVERTISEMENT

NOTICE TO BIDDERS

PURCAHSING INSERTS ADVERTISEMENT INFORMATION HERE

For more information, please refer to the For more information, please refer to the Purchasing Website at <http://www.clpccd.org/business/open.php>

THIS PAGE INTENTIONALLY BLANK

INSTRUCTIONS FOR BIDDERS

1. **Preparation and Submittal of Bid Proposal.**
 - 1.1 **Bid Proposal Preparation.** All information required by the bid forms must be completely and accurately provided. Numbers shall be stated in both words and figures where so indicated in the bid forms. Conflicts between a number stated in words and in figures are governed by the words. Partially completed Bid Proposals or Bid Proposals submitted on other than the bid forms included herein are non-responsive and will be rejected. Bid Proposals not conforming to these Instructions for Bidders and the Notice to Contractors Calling for Bids ("Call for Bids") may be deemed non-responsive and rejected.
 - 1.2 **Bid Proposal Submittal.** Bid Proposals shall be submitted at the place designated in the Call for Bids in sealed envelopes bearing on the outside the Bidder's name and address along with an identification of the Work for which the Bid Proposal is submitted. Bidders are solely responsible for timely submission of Bid Proposals to the District at the place designated in the Call for Bids.
 - 1.3 **Bidders Statement of Qualifications.** In order to be qualified to bid and be awarded a contract for the Project, the successful entity must review and answer prequalification questions under section 4 of the Statement of Qualifications.
 - 1.4 **Date and Time of Bid Proposal Submittal.** The District will place a clock ("the District Clock") in a conspicuous location at the place designated for submittal of Bid Proposals. For purposes of determining the time that a Bid Proposal is submitted, the District Clock shall be controlling. The foregoing notwithstanding, whether or not Bid Proposals are opened exactly at the time fixed in the Call for Bids, no Bid Proposals shall be received or considered by the District after it has commenced the public opening and reading of Bid Proposals. Bid Proposals submitted after such time are non-responsive and will be returned to the Bidder unopened.
2. **Bid Security.** Each Bid Proposal shall be accompanied by Bid Security in the form of: (a) cash, (b) a certified or cashier's check made payable to the District or (c) a Bid Bond, in the form and content attached hereto, in favor of the District executed by the Bidder as a principal and a Surety as surety (the "Bid Security") in an amount not less than the percentage of the maximum amount of the Bid Proposal. Any Bid Proposal submitted without the required Bid Security is non-responsive and will be rejected. If the Bid Security is in the form of a Bid Bond, the Bidder's Bid Proposal shall be deemed responsive only if the Bid Bond is in the form and content included herein and the Surety is an Admitted Surety Insurer under Code of Civil Procedure §995.120.
3. **Documents Accompanying Bid Proposal; Signatures.** The Bid Proposal must be submitted with: Bid Security, Subcontractors List, Statement of Qualifications, Certification of Pre-Bid Site Visit, Public Works Contractor Registration Certification Form and Non-Collusion Affidavit. The Bid Proposal, Statement of Qualifications and the Non-Collusion Affidavit shall be executed by an individual duly authorized to execute the same on behalf of the Bidder.
4. **Modifications.** Changes to the bid forms which are not specifically called for or permitted may result in the District's rejection of the Bid Proposal as being non-responsive. No oral or telephonic modification of any submitted Bid Proposal will be considered. A written modification may be considered only if actually received by the District prior to the scheduled closing time for receipt of Bid Proposals and the public opening thereof.

5. **Erasures; Inconsistent or Illegible Bid Proposals.** Bid Proposals must not contain any erasures, interlineations or other corrections unless the same are suitably authenticated by affixing in the margin immediately opposite such erasure, interlineations or correction the surname(s) of the person(s) signing the Bid Proposal. Any Bid Proposal not conforming to the foregoing may be deemed by the District to be non-responsive. If any Bid Proposal or portions thereof, is determined by the District to be illegible, ambiguous or inconsistent, whether by virtue of any erasures, interlineations, corrections or otherwise, the District may reject such a Bid Proposal as being non-responsive.
6. **Examination of Site and Contract Documents.** Each Bidder shall, at its sole cost and expense, inspect the Site and to become fully acquainted with the Contract Documents and conditions affecting the Work. The failure of a Bidder to receive or examine any of the Contract Documents or to inspect the Site shall not relieve such Bidder from any obligation with respect to the Bid Proposal, or the Work required under the Contract Documents. The District assumes no responsibility or liability to any Bidder for, nor shall the District be bound by, any understandings, representations or agreements of the District's agents, employees or officers concerning the Contract Documents or the Work made prior to execution of the Contract which are not in the form of Bid Addenda duly issued by the District. The submission of a Bid Proposal shall be deemed prima facie evidence of the Bidder's full compliance with the requirements of this section.
7. **Withdrawal of Bid Proposal.** Any Bidder may withdraw its Bid Proposal by of written request actually received by the District prior to the scheduled closing time for the receipt of Bid Proposals and the District's public opening and reading of Bid Proposals. A written notice of withdrawal of a submitted Bid Proposal received after the scheduled closing time for receipt of Bid Proposals or the District's public opening and reading of Bid Proposals shall not be considered by the District, nor effective to withdraw such Bid Proposal.
8. **Agreement and Bonds.** The Agreement which the successful Bidder, as Contractor, will be required to execute along with the forms and amounts of the Labor and Material Payment Bond, Performance Bond and other documents and instruments which will be required to be furnished are included in the Contract Documents and shall be carefully examined by the Bidder.
9. **Interpretation of Drawings, Specifications or Contract Documents.** Any Bidder in doubt as to the true meaning of any part of the Contract Documents finds discrepancies, errors or omissions therein or finds variances in any of the Contract Documents with applicable rules, regulations, ordinances and/or laws, a written request for an interpretation or correction thereof may be submitted to the District. It is the sole and exclusive responsibility of the Bidder to submit such request not less than three (3) days prior to the scheduled closing date for the receipt of Bid Proposals. Interpretations or corrections of the Contract Documents will be by written addendum issued by the District or the Architect. A copy of any such addendum will be mailed, faxed, emailed or delivered to each Bidder receiving a set of the Contract Documents. No person is authorized to render an oral interpretation or correction of any portion of the Contract Documents to any Bidder, and no Bidder is authorized to rely on any such oral interpretation or correction. Failure to request interpretation or clarification of any portion of the Contract Documents pursuant to the foregoing is a waiver of any discrepancy, defect or conflict therein.
10. **District's Right to Modify Contract Documents.** Before the public opening and reading of Bid Proposals, the District may modify the Work, the Contract Documents, or any portion(s) thereof by the issuance of written addenda disseminated to all Bidders who have obtained a copy of the Specifications, Drawings and Contract Documents pursuant to the Call for Bids. If the District issues any addenda during the bidding, the failure of any Bidder to acknowledge such addenda in its Bid Proposal will render the Bid Proposal non-responsive and rejected.

11. **Non-Collusion Affidavit.** No person, firm, corporation or other entity shall submit or be interested in more than one Bid Proposal for the same Work provided, however, that a person, firm or corporation that has submitted a sub-proposal to a Bidder or who has quoted prices for materials to a Bidder is not thereby disqualified from submitting a sub-proposal, quoting prices to other Bidders or submitting a Bid Proposal for the proposed Work to the District. The form of Non-Collusion Affidavit included in the Contract Documents must be completed and duly executed on behalf of the Bidder failure of a Bidder to submit a completed and executed Non-Collusion Affidavit with its Bid Proposal will render the Bid Proposal non-responsive.
12. **Award of Contract.**
- 12.1 **Waiver of Irregularities or Informalities.** The District reserves the right to reject any and all Bid Proposals or to waive any irregularities or informalities in any Bid Proposal or in the bidding.
- 12.2 **Award to Lowest Responsive and Responsible Bidder.** The award of the Contract, if made by the District through action of its Board of Trustees, will be to the responsible Bidder submitting the lowest priced responsive Bid Proposal on the basis of the Base Bid Proposal, in accordance with these Instructions for Bidders. The low bidder will be determined by the sum of Bid Items See Bid form and insert here.
- 12.3 **Selection of Alternate Bid Items.** Not Used – Unless on Bid Form.
- 12.4 **Alternate Bid Items Not Included in Award of Contract.** Bidders are referred to the provisions of the Contract Documents permitting the District, during performance of the Work, to add or delete from the scope of the Work any or all of the Alternate Bid Items with the cost or credit of the same being the amount(s) set forth by in the Alternate Bid Items Proposal.
- 12.5 **Responsive Bid Proposal.** A responsive Bid Proposal shall mean a Bid Proposal which conforms, in all material respects, to the Bid and Contract Documents.
- 12.6 **Responsible Bidder.** A responsible Bidder is a Bidder who has the capability in all respects, to perform fully the requirements of the Contract Documents and the moral and business integrity and reliability, which will assure good faith performance. In determining responsibility, the following criteria will be considered: (i) the ability, capacity and skill of the Bidder to perform the Work of the Contract Documents (ii) whether the Bidder can perform the Work promptly and within the time specified, without delay or interference (iii) the character, integrity, reputation, judgement, experience and efficiency of the Bidder (iv) the quality of performance of the Bidder on previous contracts, by way of example only, the following information will be considered: (a) the administrative, consultant or other cost overruns incurred by the District on previous contracts with the Bidder (b) the Bidder's compliance record with contract general conditions on other projects (c) the submittal by the Bidder of excessive and/or unsubstantiated extra cost proposals and claims on other projects (d) the Bidder's record for completion of work within the contract time and the Bidder's compliance with the scheduling and coordination requirements on other projects (e) the Bidder's demonstrated cooperation with the District and other contractors on previous contracts (f) whether the work performed and materials furnished on previous contracts was in accordance with the Contract Documents (v) the previous and existing compliance by the Bidder with laws and ordinances relating to contracts (vi) the sufficiency of the financial resources and ability of the Bidder to perform the work of the Contract Documents (vii) the quality, availability and adaptability of the goods or services to the particular use required (viii) the ability of the Bidder to provide future maintenance and service for the warranty period of the Contract (ix) whether the Bidder is in arrears on debt

or contract or is a defaulter on any surety bond (x) such other information as may be secured by the District having a bearing on the decision to award the Contract, to include without limitation the ability, experience and commitment of the Bidder to properly and reasonably plan, schedule, coordinate and execute the Work of the Contract Documents and whether the Bidder has ever been debarred from bidding or found ineligible for bidding on any other projects. The ability of a Bidder to provide the required bonds will not of itself demonstrate responsibility of the Bidder.

13. Subcontractors.

13.1 Designation of Subcontractors; Subcontractors List. Each Bidder shall submit a list of its proposed Subcontractors for the proposed Work as required by the Subletting and Subcontracting Fair Practices Act (California Public Contract Code §4100 et seq.) on the form furnished. The failure of any Bid Proposal to include all information required by the Subcontractors List will result in rejection of the Bid Proposal for non-responsiveness. Each Subcontractor shall maintain annual compliance with Senate Bill 854 and Workers Compensation/Employers Liability Insurance and Commercial General Liability Insurance as required by the Contract.

13.2 Work of Subcontractors. All Bidders are referred to the Contract Documents and the notation therein that all Contract Documents are intended to be complimentary and that the organization or arrangements of the Specifications and Drawings shall not limit the extent of the Work of the Contract Documents. Accordingly, all Bidders are encouraged to disseminate all of the Specifications, Drawings and other Contract Documents to all persons or entities submitting sub-bids to the Bidder. The omission of any portion or item of Work from the Bid Proposal or from the sub-bidders' sub-bids which is/are necessary to produce the intended results and/or which are reasonably inferable from the Contract Documents is not a basis for adjustment of the Contract Price or the Contract Time. Dissemination of the Contract Documents to sub-bidders and dissemination of addenda issued during the bidding process is solely the responsibility of each Bidder.

13.3 Subcontractor Bonds. In accordance with California Public Contract Code §4108, if a Bidder requires a bond or bonds of its Subcontractor(s), whether the expense of procuring such bond or bonds are to be borne by the Bidder or the Subcontractor(s), such requirements shall be specified in the Bidder's written or published request for sub-bids. Failure of the Bidder to comply with these requirements shall preclude the Bidder from imposing bonding requirements upon its Subcontractor(s) or rejection of a Subcontractor's bid under California Public Contract Code §4108(b).

14. Workers' Compensation Insurance. Pursuant to California Labor Code §3700, the successful Bidder shall secure Workers' Compensation Insurance for its employees engaged in the Work of the Contract. The successful bidder shall sign and deliver to the District the following certificate prior to performing any of the Work under the Contract:

“I am aware of the provisions of §3700 of the California Labor Code which require every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that Code and I will comply with such provisions before commencing the performance of the Work of the Contract.”

The form of such Certificate is included as part of the Contract Documents.

15. Bid Security Return. The Bid Security of the three or more low Bidders, the number being solely at the discretion of the District, will be held by the District for ten (10) days after the period for which Bid Proposals must be held open (which is set forth in the Call for Bids) or until posting by the

successful Bidder(s) of the bonds, certificates of insurance required and return of executed copies of the Agreement, whichever first occurs, at which time the Bid Security of such other Bidders will be returned to them.

16. **Forfeiture of Bid Security.** If the Bidder awarded the Contract fails or refuses to execute the Agreement within ten (10) calendar days from the date of receiving notification that it is the Bidder to whom the Contract has been awarded, the District may declare the Bidder's Bid Security forfeited as damages caused by the failure of the Bidder to enter into the Contract and may thereupon award the Contract for the Work to the responsible Bidder submitting the next lowest Bid Proposal or may call for new bids, in its sole and exclusive discretion.
17. **Contractor's License.** No Bid Proposal will be considered from a Bidder who, at the time Bid Proposals are opened, is not licensed to perform the Work, in accordance with the Contractors License Law, California Business & Professions Code 7000 et seq. This requirement is not a mere formality and will not be waived by the District or its Board of Trustees. The required California Contractor's License classification(s) for the Work is/are set forth in the Call for Bids.
18. **Anti-Discrimination.** It is the policy of the District that there is no discrimination against any prospective or active employee engaged in the Work because of race, color, ancestry, national origin, religious creed, sex, age or marital status. All Bidders agree to comply with the District's anti-discrimination policy and all applicable Federal and California anti-discrimination laws including but not limited to the California Fair Employment & Housing Act beginning with California Government Code 12940 et seq. and California Labor Code 1735. In addition, all Bidders agree to require like compliance by any Subcontractor employed by them on the Work of the Contract.
19. **Bidder's Qualifications.** Each Bidder shall submit with its Bid Proposal the Statement of Bidder's Qualifications, which is included within the Contract Documents. All information required by Statement of Bidder's Qualifications shall be completely and fully provided. Any Bid Proposal not accompanied by the Statement of Bidder's Qualifications completed with all information required and bearing the signature of the Bidder's duly authorized representative under penalty of perjury will render the Bid Proposal non-responsive and rejected. If the District determines that any information provided by a Bidder in the Statement of Bidder's Qualifications is false or misleading, or is incomplete so as to be false or misleading, the District may reject the Bid Proposal submitted by such Bidder as being non-responsive.
20. **Job-Walk.** The District will conduct a Mandatory/Non-Mandatory Job-Walk at the time(s) and place(s) designated in the Call for Bids. The District may in its sole and exclusive discretion, elect to conduct one or more Job-Walk(s) in addition to that set forth in the Call for Bids, in which event the District shall notify all Bidders who have theretofore obtained the Contract Documents pursuant to the Call for Bids of any such additional Job-Walk. If the District elects to conduct any Job-Walk in addition to that set forth in the Call for Bids, the District shall in its notice of any such additional Job-Walk(s), indicate whether Bidders' attendance at such additional Job-Walk(s) is/are mandatory. If attendance at the Job Walk is indicated in the Call for Bids as being mandatory, the failure of any Bidder to have its authorized representative present at the entirety of the Job-Walk will render the Bid Proposal of such Bidder to be non-responsive. Where the Job-Walks are mandatory, a Bidder may have more than one authorized representative and/or representatives of its Subcontractors present at the Job-Walk provided, however that attendance by representatives of the Bidder's Subcontractors without attendance by a representative of the Bidder shall not be sufficient to meet the Bidder's obligations hereunder and will render the Bid Proposal of such Bidder to be non-responsive. The District will reject the Bid Proposal of a Bidder who obtains the Bid and Contract Documents after the date of the Mandatory Job-Walks set forth in the Call for Bids unless a Job-Walk is requested by such Bidder and a Job-Walk is conducted by the District in accordance with the following provisions. The District may, in its sole and exclusive discretion, conduct such requested Job-Walk taking into consideration factors such as the time remaining prior to the

scheduled opening of Bid Proposals. Any such requested Job Walk will be conducted only upon the requesting Bidder's agreement to reimburse the District for the actual and/or reasonable costs for the District's staff and its agents and representatives in arranging for and conducting such additional Job-Walk.

- 21. Public Records.** Bid Proposals and other documents responding to the Call for Bids become the exclusive property of the District upon submittal to the District. At such time as the District issues the Notice of Intent to award the Contract pursuant to these Instructions for Bidders, all Bid Proposals and other documents submitted in response to the Call for Bids become a matter of public record and shall be thereupon be considered public records, except for information contained in such Bid Proposals deemed to be Trade Secrets (as defined in California Civil Code §3426.1) and information provided in response to the Statement of Qualifications. A Bidder that indiscriminately marks all or most of its Bid Proposal as exempt from disclosure as a public record, whether by the notations of "Trade Secret," "Confidential," "Proprietary," or otherwise, may result render the Bid Proposal non-responsive and rejected. The District is not liable or responsible for the disclosure of such records, including those exempt from disclosure if disclosure is deemed required by law, by an order of Court, or which occurs through inadvertence, mistake or negligence on the part of the District or its officers, employees or agents. At such time as Bid Proposals are deemed a matter of public record, pursuant to the above, any Bidder or other party shall be afforded access for inspection and/or copying of such Bid Proposals, by request made to the District in conformity with the California Access to Public Records Act, California Government Code §6250, et. seq. If the District is required to defend or otherwise respond to any action or proceeding wherein request is made for the disclosure of the contents of any portion of a Bid Proposal deemed exempt from disclosure hereunder, the Bidder submitting the materials sought by such action or proceeding agrees to defend, indemnify and hold harmless the District in any action or proceeding from and against any liability, including without limitation attorneys' fees arising therefrom. The party submitting materials sought by any other party shall be solely responsible for the cost and defense in any action or proceeding seeking to compel disclosure of such materials the District's sole involvement in any such action shall be that of a stakeholder, retaining the requested materials until otherwise ordered by a court of competent jurisdiction.
- 22. Drug Free Workplace Certificate.** In accordance with California Government Code §8350 et seq., the Drug Free Workplace Act of 1990, the successful Bidder will be required to execute a Drug Free Workplace Certificate concurrently with execution of the Agreement. The successful Bidder will be required to implement and take the affirmative measures outlined in the Drug Free Workplace Certificate and in California Government Code §8350 et seq. Failure of the successful Bidder to comply with the measures outlined in the Drug Free Workplace Certificate and in California Government Code §8350 et seq. may result in penalties, including without limitation, the termination of the Agreement, the suspension of any payment of the Contract Price otherwise due under the Contract Documents and/or debarment of the successful Bidder.
- 23. Public Works Contractor Registration Certificate.** Pursuant to California Senate Bill 854, the qualified Contractor shall be registered with the California's Department of Industrial Relations (DIR) and its subcontractors who intend to bid or perform work on any public works project, as defined under Labor Code Section 1720. The qualified Contractor shall sign and deliver to the District the form of Public Works Contractor Registration Certification included with the Contract Documents.
- 24. Compliance with Immigration Reform and Control Act of 1986.** The Bidder is solely and exclusively responsible for employment of individuals for the Work of the Contract in conformity with the Immigration Reform and Control Act of 1986, 8 USC §§1101 et seq. (the "IRCA"); the successful Bidder shall also require that any person or entity employing labor in connection with any of the Work of the Contract shall so similarly comply with the IRCA.

- 25. Notice of Intent to Award Contract.** Following the public opening and reading of Bid Proposals, the District will issue a Notice of Intent to Award the Contract, identifying the Bidder to whom the District intends to award the Contract and the date/time/place of the District's Board of Trustees meeting at which award of the Contract will be considered.
- 26. Bid Protest.** Any Bidder submitting a Bid Proposal to the District may file a protest of the District's intent to award the Contract provided that each and all of the following are complied with:
- (i) The bid protest is in writing
 - (ii) The bid protest is filed and received by the District's Vice-Chancellor, Facilities Planning and Management not more than five (5) calendar days following the date of issuance of the District's Notice of Intent to Award the Contract and
 - (iii) The written bid protest sets forth, in detail, all grounds for the bid protest, including without limitation all facts, supporting documentation, legal authorities and argument in support of the grounds for the bid protest any matters not set forth in the written bid protest shall be deemed waived. All factual contentions must be supported by competent, admissible and creditable evidence.

Any bid protest not conforming to the foregoing shall be rejected by the District as invalid. Provided that a bid protest is filed in strict conformity with the foregoing, the District's Vice-Chancellor, Facilities Planning and Management or such individual(s) as may be designated by him/her, shall review and evaluate the basis of the bid protest. Either, the District's Vice-Chancellor, Facilities Planning and Management or other individual designated by him/her shall provide the bidder submitting the bid protest with a written statement concurring with or denying the bid protest. The District's Board of Trustees will render a final determination and disposition of a bid protest by taking action to adopt, modify or reject the disposition of a bid protest as reflected in the written statement of the District's Vice-Chancellor, Facilities Planning and Management or his/her designee. Action by the District's Board of Trustees relative to a bid protest shall be final and not subject to appeal or reconsideration by the District's Vice-Chancellor, Facilities Planning and Management any other employee or officer of the District or the District's Board of Trustees. The rendition of a written statement by the District's Vice-Chancellor, Facilities Planning and Management (or his/her designee) and action by the District's Board of Trustees to adopt, modify or reject the disposition of the bid protest reflected in such written statement shall be express conditions precedent to the institution of any legal or equitable proceedings relative to the bidding process, the District's intent to award the Contract, the District's disposition of any bid protest or the District's decision to reject all Bid Proposals. In the event that any such legal or equitable proceedings are instituted and the District is named as a party thereto, the prevailing party(ies) shall recover from the other party(ies), as costs, all attorneys' fees and costs incurred in connection with any such proceeding, including any appeal arising therefrom.

End of Section

THIS PAGE INTENTIONALLY BLANK

THIS PAGE INTENTIONALLY BLANK

NON-COLLUSION AFFIDAVIT

STATE OF CALIFORNIA)
COUNTY OF _____)

PROJECT: BID NO.: XXXXX Name of Project Here, Name of College

I, _____, being first duly sworn, deposes and says that I
(Typed or Printed Name)
am the _____ of _____, the party
(Title) (Bidder Name)
submitting the foregoing Bid Proposal ("the Bidder"). In connection with the foregoing Bid Proposal, the undersigned declares, states and certifies that:

1. The Bid Proposal is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization or corporation.
2. The Bid Proposal is genuine and not collusive or sham.
3. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any other bidder or anyone else to put in sham bid, or to refrain from bidding.
4. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price, or that of any other bidder, or to fix any overhead, profit or cost element of the bid price or that of any other bidder, or to secure any advantage against the public body awarding the contract or of anyone interested in the proposed contract.
5. All statements contained in the Bid Proposal and related documents are true.
6. The bidder has not, directly or indirectly, submitted the bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any person, corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

Executed this ____ day of _____, 2021 at _____.
(City, County and State)

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Signature

(Address)

Name Printed or Typed

(City, County and State)

(_____) _____
(Area Code and Telephone Number)

THIS PAGE INTENTIONALLY BLANK

STATEMENT OF BIDDER'S QUALIFICATIONS

1. Bidder's Organization

1.1 Form of entity of Bidder, i.e., corporation, partnership, etc. _____

1.1.1 If a corporation, state the following:

State of incorporation: _____

Date of incorporation: _____

President/Chief Executive Officer: _____

Secretary: _____

Treasurer/Chief Financial Officer: _____

1.1.2 If a partnership, state the following:

Type of partnership, i.e., general partnership, limited partnership: _____

Names of all general partners, if any of the general partners are not natural persons, provide the information for each such general partner requested by Paragraphs 1.1.1, 1.1.2 and 1.1.4 as appropriate: _____

1.1.3 If a proprietorship, state the names of all proprietors: _____

1.1.4 If a joint venture, state the following

Date of organization: _____

Names of all joint venture members. For each member of the joint venture, provide the information requested by Paragraphs 1.1.1, 1.1.2 and 1.1.3 for each joint venture member, as applicable: _____

1.2 Number of years your organization has been in business as a contractor: _____

1.3 Number of years your organization has conducted business under its present name:

1.4 If your organization has conducted business under a name or name style different than your organization's present name, identify all prior name(s) or name style(s):

1.5 Your organization's Federal Tax Identification Number: _____

1.6 Your Public Works Contractor Registration Number: _____

2. Licensing

2.1 California Contractors License: Number: _____
Expiration Date: _____
Responsible Managing Employee/Officer: _____
License Classification(s): _____

2.2 Has a claim or other demand ever been made against your organization's California Contractors License Bond _____ Yes _____ No
If yes, on a separate attachment, state the following: (i) the name, address and telephone number of each person or entity making claim or demand (ii) the date of each claim or demand (iii) the circumstances giving rise to each such claim or demand and (iv) the disposition of each such claim or demand.

2.3 Has a complaint ever been filed against your organization's California Contractors License with the California Contractors State License Board _____ Yes _____ No
If yes, on a separate attachment, state the following for each complaint: (i) the name, address and telephone number of each person or entity making the complaint (ii) the date of each complaint (iii) the circumstances giving rise to each such complaint and (iv) the disposition of each such complaint, including without limitation, any disciplinary or other action imposed or taken by the California Contractors State License Board as a result of any such complaint.

2.4 Has your contractors' license(s) been consistently active for at least five (5) years without revocation or suspension _____ Yes _____ No

3. Experience

3.1 Categories of work (other than management/supervision) your organization typically performs with your own forces _____

3.2 On a separate attachment, list similar sized construction project completed by your organization in the past seven (7) years and for each project identified, state: (i) a general description of the work performed by your organization on the project (ii) the dollar value of the work performed or to be performed by your organization, percentage of change orders for the project, original completion date and final completion date (iii) the project owner's name, address, telephone number and email address, the name of the project owner's representative, address, telephone number and email address and (iv) the project architect's name, address, telephone number, contact person and their email address.

3.3 On a separate attachment, list all construction projects your organization has in progress and for each project listed, state: (i) a general description of the work performed by your organization on the project (ii) the dollar value of the work performed or to be performed

by your organization; (iii) the project owner's name, name of the project owner's representative and the address and telephone number of the project owner and the project owner's representative; (iv) the project architect's name, address, telephone number and contact person (v) percent presently complete and (vi) the current scheduled completion date.

4. Performance History

- 4.1 Claims and lawsuits (if you answer yes to any of the following, you must attach details).
 - 4.1.1 Have any lawsuits or other administrative, legal, arbitration or other proceedings, ever been brought or commenced against your organization or any of its principals, officers or equity owners in connection with any construction contract or construction project Yes No
 - 4.1.2 Has your organization ever filed a lawsuit or commenced other administrative, legal or other proceedings in connection with any construction contract or construction project Yes No
 - 4.1.3 Are there any judgements, orders, decrees, mediation or arbitration awards pending, outstanding against your organization or any of the officers, directors, employees or principals of your organization Yes No
- 4.2 Has your organization ever refused to sign a construction contract awarded to it Yes No
- 4.3 Has your organization ever failed to complete a construction contract Yes No
- 4.4 Has your organization ever been declared in default of a construction contract within California within the past ten (10) years Yes No
- 4.5 Has any construction contract to which your organization has been or is a party to been terminated for the convenience of the project owner Yes No
- 4.6 Has a claim or other demand ever been asserted against any Bid Bond, Performance Bond, or Payment Bond posted by your organization in connection with any construction contract or your submittal of a bid proposal for a construction contract Yes No
- 4.7 Has your Firm or an Associated Firm or any of their owners or officers who owns ten percent (10 %) or more equity interest of your organization been convicted of a crime under federal, state, or local law involving: bidding for, awarding of, or performance of a contract with a public entity making a false claim(s) to any public entity or fraud, theft, or other act of dishonesty to any contracting party within the past ten (10) years Yes No
- 4.8 Has your organization or any predecessor to your organization been charged with a violation of the California False Claims Act or similar federal statute within the past ten (10) years Yes No

4.9 Has any individual or entity who owns ten percent (10) or more of the equity interest of your organization been an equity owner of ten percent (10) or more of the equity interest of any other entity or organization, within the past ten (10) years, which has been charged with a violation of the California False Claims Act or similar federal statute within the past ten (10) years
_____ Yes _____ No

4.10 Has any individual or entity who owns ten percent (10) or more of the equity interest of your organization been charged with a violation of the California False Claims Act or similar federal statute within the past ten (10) years
_____ Yes _____ No

If "YES" to any of the above questions you will Not qualify for this project.

4.11 Has your Firm contracted for and completed construction of a minimum of three (3) California community college, university or higher education projects, each with a value of at least **\$5,000,000**, and all within the past seven (7) years
_____ Yes _____ No

5.0 **References** (Include name, contact person, telephone, email and address for each reference provided):

5.1 Trade References (three (3) minimum)

5.2 Bank References

5.3 Public Works Inspectors of Record (-12 or community college project)

5.4 Owner references (three (3) minimum, California community college districts and/or -12 school district

6.0 Accuracy and Authority

The undersigned is duly authorized to execute this Statement of Bidders Qualifications under penalty of perjury on behalf of the Bidder. The undersigned warrants and represents that he/she has personal knowledge of each of the responses to this Statement of Bidder's Qualifications and/or that he/she has conducted all necessary and appropriate inquiries to determine the truth, completeness and accuracy of responses to this Statement of Bidder's Qualifications.

The undersigned declares and certifies that the responses to this Statement of Bidder's Qualifications are complete and accurate there are no omissions of material fact or information that render any response to be false or misleading and there are no misstatements of fact in any of the responses.

Executed this ___ day of _____ 2024 at _____

(City and State)

I declare under penalty of perjury under California law that the foregoing is true and correct.

(Signature)

(Typed or written name)

THIS PAGE INTENTIONALLY BLANK

BID BOND

KNOW ALL MEN BY THESE PRESENTS that we, _____, as Surety and _____, as Principal, are jointly and severally, along with their respective heirs, executors, administrators, successors and assigns, held and firmly bound unto **CHABOT-LAS POSITAS COMMUNITY COLLEGE DISTRICT**, hereinafter "the Oblige," for payment of the penal sum hereof in lawful money of the United States, as more particularly set forth herein.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, the Principal has submitted the accompanying Bid Proposal to the Oblige for the Work commonly described as the **BID NO.: XXXXX Name of Project Here, Name of College**

WHEREAS, subject to the terms of this Bond, the Surety is firmly bound unto the Oblige in the penal sum of **ten percent (10%)** of the maximum amount of the Bid Proposal submitted by the Principal to the Oblige, as set forth above.

NOW THEREFORE, if the Principal shall not withdraw said Bid Proposal within the period specified therein after the opening of the same, or, if no period be specified, for sixty (60) days after opening of said Bid Proposal and if the Principal is awarded the Contract, and shall within the period specified therefor, or if no period be specified, within five (5) days after the prescribed forms are presented to him for signature, enter into a written contract with the Oblige, in accordance with the Bid Proposal as accepted and give such bond(s) with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such Contract and for the payment for labor and materials used for the performance of the Contract, or in the event of the withdrawal of said Bid Proposal within the period specified for the holding open of the Bid Proposal or the failure of the Principal to enter into such Contract and give such bonds within the time specified, if the Principal shall pay the Oblige the difference between the amount specified in said Bid Proposal and the amount for which the Oblige may procure the required Work and/or supplies, if the latter amount be in excess of the former, together with all costs incurred by the Oblige in again calling for Bids, then the above obligation shall be void and of no effect, otherwise to remain in full force and effect.

Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or the Call for Bids, the Work to be performed thereunder, the Drawings or the Specifications accompanying the same, or any other portion of the Contract Documents shall in no way affect its obligations under this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of said Contract, the Call for Bids, the Work, the Drawings or the Specifications, or any other portion of the Contract Documents.

In the event suit or other proceeding is brought upon this Bond by the Oblige, the Surety shall pay to the Oblige all costs, expenses and fees incurred by the Oblige in connection therewith, including without limitation, attorney's fees.

IN WITNESS WHEREOF, the Principal and Surety have executed this instrument this _____ day of _____, 2021 by their duly authorized agents or representatives.

(Principal's Corporate Seal)

(Principal Name)

By: _____

(Typed or Printed Name)

Title: _____

(Surety's Corporate Seal)

(Surety Name)

By: _____
(Signature of Surety)

(Attach Attorney-in-Fact Certificate)

(Typed or Printed Name)

() _____
(Area Code and Telephone Number of Attorney-in-Fact for Surety)

Contact name, address, telephone number and email address for notices to the Surety

(Contact Name)

(Address)

(Telephone)

(Email address)

CERTIFICATION OF PRE-BID SITE VISIT

The Honorable Board of Trustees
Chabot-Las Positas Community College District
7600 Dublin Blvd., 3rd Floor
Dublin, California 94568

RE: BID NO.: XXXXX Name of Project Here Name of College

Ladies and Gentlemen:

In connection with submitting a Bid Proposal for the Work described as BID NO.: **XXXXX Name of Project Here Name of College**, I visited the Site of the Work on **DATE and Time**

on behalf of _____
Bidder Name

to inspect the Site of the proposed work, which will be turned over to the Bidder, if awarded the Contract, in its present condition, with a representative of the Chabot-Las Positas Community College, in order to acquaint the Bidder with the proposed Work so that the Bidder fully understands the facilities, difficulties, and restrictions attendant to execution and completion of the Work. I have also reviewed on behalf of the Bidder, the as-built drawings and/or previous Contract Documents, site conditions and Bid Documents with District representatives and/or Construction Manager for the Project.

I certify all conditions provided for my review and their effect on the Work as called for in the Contract Documents are included and accounted for in the Bid Proposal amounts submitted to the District.

I understand that a Bidder who fails to submit this Certification of Pre-Bid Site Visit, fully executed, with the Bidder's Bid Proposal form, will result in rejection of the Bid Proposal for non-responsiveness.

Name of Bidder

Authorized Signatory

Address

Phone Number

Date

THIS PAGE INTENTIONALLY BLANK

BID PROPOSAL

TO: **CHABOT-LAS POSITAS COMMUNITY COLLEGE DISTRICT**, a California Community College District, acting by and through its Board of Trustees (“the District”).

FROM:

(Name of Bidder)
(Address)
(City, State, Zip Code)
(Telephone/Fax)
(E-Mail Address of Bidder’s Representative(s))
(Name(s) of Bidder’s Authorized Representative(s))

1. Bid Proposal

1.	Base Bid	
2.	Owner’s Non-Specified Allowance	250,000.00
3.	Total Bid Amount (Sum of Line 1 + 2)	

1.1 Bid Proposal Amount. The undersigned Bidder proposes and agrees to perform the Contract including, without limitation, providing and furnishing any and all of the labor, materials, tools, equipment and services necessary to complete in a workmanlike manner all of the Work and other obligations required by the Contract Documents for the sum of _____ Dollars (_____) (Line 3 of Table above). The Bidder confirms that it has checked all of the above figures and understands that neither the District nor any of its agents, employees or representatives shall be responsible for any errors or omissions on the part of the undersigned Bidder in preparing and submitting this Bid Proposal. The Bidder confirms that the bid proposal includes the Owner’s Non-Specified Allowance in the amount of Two Hundred Fifty Thousand Dollars and No Cents (250,000.00).

1.2 Owner’s Non-Specified Allowance. Bidder shall include in Bid Proposal the stipulated sum of Two Hundred Fifty Thousand Dollars and No Cents (250,000.00) for non-specified work to be performed ONLY at the determination and direction of the District. Work performed at the determination and direction of the District under this Allowance

shall be documented by Contractor and submitted to Construction Manager per the requirements specified in Article 9 of the General Conditions. Contractor shall include a separate line item in Contractor’s Schedule of Values as “Allowance” with the value of Two Hundred Fifty Thousand Dollars (250,000.00). At closeout of Contract, any funds remaining in the Allowance shall be credited to Owner through a Change Order.

1.3 Acknowledgment of Bid Addenda. The Bidder confirms that this Bid Proposal incorporates and is inclusive of, all items or other matters contained in Bid Addenda issued by or on behalf of the District.

_____ **Addenda Nos.** _____ received, acknowledged
(initial) and incorporated into this Bid Proposal.

2. **Documents Accompanying Bid.** The Bidder has submitted with this Bid Proposal the following: (a) Bid Security (b) Subcontractors List (c) Statement of Qualifications (d) Certification of Pre-Bid Site Visit (e) Non-Collusion Affidavit and (f) Public Works Contractor Registration Certification Form. The Bidder acknowledges that if this Bid Proposal and the foregoing documents are not fully in compliance with applicable requirements set forth in the Call for Bids, the Instructions for Bidders and in each of the foregoing documents, the Bid Proposal may be rejected as non-responsive.

3. **Award of Contract.** If the Bidder submitting this Bid Proposal is awarded the Contract, the undersigned will execute and deliver to the District the Contract in the form attached hereto within ten (10) days after notification of award of the Contract. Concurrently with delivery of the executed Agreement to the District, the Bidder awarded the Contract shall deliver to the District: (a) Certificates of Insurance evidencing all insurance coverages required under the Contract Documents (b) the Performance Bond (c) the Labor and Material Payment Bond (d) the Certificate of Workers’ Compensation Insurance; and (e) the Drug-Free Workplace Certificate. Failure of the Bidder awarded the Contract to strictly comply with the preceding may result in the District’s rescission of the award of the Contract and/or forfeiture of the Bidder’s Bid Security. In such event, the District may, in its sole and exclusive discretion elect to award the Contract to the responsible Bidder submitting the next lowest Bid Proposal, or to reject all Bid Proposals.

4. **Contractor's License.** The undersigned Bidder is currently and duly licensed in accordance with the California Contractors License Law, California Business & Professions Code 7000 et seq., under the following classification(s) _____ bearing License Number(s) _____, with expiration date(s) of _____. The Bidder certifies that: (a) it is duly licensed, in the necessary class(es), for performing the Work of the Contract Documents (b) that such license shall be in full force and effect throughout the duration of the performance of the Work under the Contract Documents and (c) that all Subcontractors providing or performing any portion of the Work shall be so properly licensed to perform or provide such portion of the Work.

5. **Acknowledgment and Confirmation.** The undersigned Bidder acknowledges its receipt, review and understanding of the Drawings, the Specifications and other Contract Documents pertaining to the proposed Work. The undersigned Bidder certifies that the Contract Documents are, in its opinion, adequate, feasible and complete for providing, performing and constructing the Work in a sound and suitable manner for the use specified and intended by the Contract Documents. The undersigned Bidder certifies that it has, or has available, all necessary equipment, personnel, materials, facilities and technical and financial ability to complete the

Work for the amount bid herein within the Contract Time and in accordance with the Contract Documents.

By: _____

(Signature)

(Corporate Seal)

(Typed or Printed Name)

Title: _____

THIS PAGE INTENTIONALLY BLANK

AGREEMENT

THIS AGREEMENT is made this ____ day of _____, 2021, in the City of Dublin, County of Alameda, State of California, by and between **CHABOT-LAS POSITAS COMMUNITY COLLEGE DISTRICT**, a California Community College District hereinafter "District" and _____ ("Contractor") doing business at _____.

WITNESSETH, that the District and the Contractor in consideration of the mutual covenants contained herein agree as follows:

1. **The Work.** Within the Contract Time and for the Contract Price, subject to adjustments thereto pursuant to the Contract Documents, the Contractor shall perform and provide all necessary labor, materials, tools, equipment, utilities, services and transportation to complete in a workmanlike manner all of the Work required in connection with the work of improvement commonly referred to as **BID NO.: XXXXX Name of Project Here Name of College** Contractor shall complete all Work covered by the Contract Documents, including without limitation, the Drawings and Specifications prepared by Catalyst Consulting Group and other Contract Documents enumerated in Article 5 below, along with all modifications and addenda thereto issued in accordance with the Contract Documents.
2. **Contract Time.** The Work shall be commenced on the date stated in the District's Notice to Proceed the Contractor shall achieve Substantial Completion of the Work within the Contract Time set forth in the Contract Documents.
3. **Contract Price.** The District shall pay the Contractor as full consideration for the Contractor's full, complete and faithful performance of the Contractor's obligations under the Contract Documents, subject to adjustments of the Contract Price in accordance with the Contract Documents, the Contract Price of _____ Dollars (\$ _____), which includes the Owner's Non-Specified Allowance of 250,000.00. The Contract Price is based upon the Contractor's Base Bid Proposal.

The District's payment of the Contract Price shall be in accordance with the Contract Documents.

4. **Liquidated Damages.** If the Contractor fails to achieve Substantial Completion of the Work within the Contract Time, including adjustments thereto authorized by the Contract Documents, the Contractor shall be subject to assessment of Liquidated Damages in accordance with the Contract Documents. Failure of the Contractor to complete Punchlist items noted upon Substantial Completion within the time established to complete the Punchlist items will result in the District's assessment of Liquidated Damages in accordance with the Contract Documents.
5. **The Contract Documents.** The documents forming a part of the Contract Documents consist of the following, all of which are component parts of the Contract Documents.

Notice to Contractors Calling For Bids	Bid Bond
Instructions For Bidders	Bid Addenda Nos. _____
Bid Proposal	Agreement
Subcontractors List	Performance Bond
Non-Collusion Affidavit	Labor and Materials Payment Bond
Statement of Bidder's Qualifications	Drug-Free Workplace Certification

Certificate of Workers Compensation
Insurance Certification
General Conditions
Special Conditions
Change Order Form
Asbestos and Other Hazardous Materials
Debris Recycling Statement

Certification of Pre-Bid Site Visit
Public Works Contractor Registration
Certification Form
Guarantee
Specifications
Drawings
Project Labor Agreement – If Required

6. **Authority to Execute.** The individual(s) executing this Agreement on behalf of the Contractor is/are duly and fully authorized to execute this Agreement on behalf of Contractor and to bind the Contractor to each and every term, condition and covenant of the Contract Documents.

CONTRACTORS ARE REQUIRED BY LAW TO BE LICENSED AND REGULATED BY THE CONTRACTORS' STATE LICENSE BOARD. ANY QUESTIONS CONCERNING A CONTRACTOR MAY BE REFERRED TO THE REGISTRAR, CONTRACTORS' STATE LICENSE BOARD, P.O. BOX 2600, SACRAMENTO, CALIFORNIA 95826

IN WITNESS WHEREOF, this Agreement has been duly executed by the District and the Contractor as of the date set forth above.

**“DISTRICT”
CHABOT-LAS POSITAS COMMUNITY
COLLEGE DISTRICT**

**“CONTRACTOR”
(CONTRACTOR NAME)**

By: _____
Date

Mr. Jonah Nicholas
Vice Chancellor, Business Services

By: _____
Date

Title: _____

(CORPORATE SEAL)

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS that we, _____,
as Principal, and _____ as Surety, are held and firmly bound unto
CHABOT-LAS POSITAS COMMUNITY COLLEGE DISTRICT hereinafter "the Obligee", in the penal
sum of _____ Dollars (_____) in lawful money of the United
States, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors
and assigns, jointly and severally.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, the Obligee, by resolution of its Board of Trustees has awarded to the Principal a
Contract for the Work described as **BID NO.: XXXXX Name of Project Here Name of College**

WHEREAS, the Principal, has entered into an agreement with the Obligee for performance of
the Work the Agreement and all other Contract Documents set forth therein are incorporated herein
and made a part hereof by this reference.

WHEREAS, by the terms of the Contract Documents, the Principal is required to furnish a bond
ensuring the Principal's prompt, full and faithful performance of the Work of the Contract Documents.

NOW THEREFORE, if the Principal shall promptly, fully and faithfully perform each and all of
the obligations and things to be done and performed by the Principal in strict accordance with the terms
of the Contract Documents as they may be modified or amended from time to time and if the Principal
shall indemnify and save harmless the Obligee and all of its officers, agents and employees from any
and all losses, liability and damages, claims, judgments, liens, costs, and fees of every description,
which may be incurred by the Obligee by reason of the failure or default on the part of the Principal in
the performance of any or all of the terms or the obligations of the Contract Documents, including all
modifications, and amendments, thereto, and any warranties or guarantees required thereunder then
this obligation shall be void otherwise, it shall be, and remain, in full force and effect.

The Surety, for value received, hereby stipulates and agrees that no change, adjustment of the
Contract Time, adjustment of the Contract Price, alterations, deletions, additions, or any other
modifications to the terms of the Contract Documents, the Work to be performed thereunder, or to the
Specifications or the Drawings shall limit, restrict or otherwise impair Surety's obligations or Obligee's
rights hereunder Surety hereby waives notice from the Obligee of any such changes, adjustments of
Contract Time, adjustments of Contract Price, alterations, deletions, additions or other modifications to
the Contract Documents, the Work to be performed under the Contract Documents, or the Drawings or
the Specifications.

In the event of the Obligee's termination of the Contract due to the Principal's breach or default
of the Contract Documents, within thirty (30) days after written notice from the Obligee to the Surety of
the Principal's breach or default of the Contract Documents and Obligee's termination of the Contract,
the Surety shall notify Obligee in writing of Surety's assumption of obligations hereunder by its election
to either remedy the default or breach of the Principal or to take charge of the Work of the Contract
Documents and complete the Work at its own expense ("the Notice of Election"); provided, however,
that the procedure by which the Surety undertakes to discharge its obligations under this Bond shall be
subject to the advance written approval of the Obligee, which approval shall not be unreasonably
withheld, limited or restricted. The insolvency of the Principal or the Principal's mere denial of a failure
of performance or default under the Contract Documents shall not by itself, without the Surety's prompt,

diligent inquiry and investigation of such denial, be justification for Surety's failure to give the Notice of Election or for its failure to promptly remedy the failure of performance or default of the Principal or to complete the Work.

In the event the Surety shall fail to issue its Notice of Election to Obligee within the time provided for hereinabove, the Obligee may thereafter cause the cure or remedy of the Principal's failure of performance or default or to complete the Work. The Principal and the Surety shall be each jointly and severally liable to the Obligee for all damages and costs sustained by the Obligee as a result of the Principal's failure of performance under the Contract Documents or default in its performance of obligations thereunder, including without limitation the costs of cure or completion exceeding the then remaining balance of the Contract Price provided that the Surety's liability hereunder for the costs of performance, damages and other costs sustained by the Obligee upon the Principal's failure of performance under or default under the Contract Documents shall be limited to the penal sum hereof, which shall be deemed to include the costs or value of any Changes to the Work which increases the Contract Price.

In the event suit or other proceeding is brought upon this Bond by the Obligee, the Surety shall pay to the Obligee all costs, expenses and fees incurred by the Obligee therewith, including without limitation, attorneys fees.

IN WITNESS WHEREOF, the Principal and Surety have executed this instrument this ____ day of _____, 2021 by their duly authorized agent or representative.

(Principal's Corporate Seal)

(Principal Name)

By: _____

(Typed or Printed Name)

Title: _____

(Surety's Corporate Seal)

(Surety Name)

By: _____
(Signature of Attorney-in-Fact for Surety)

(Attach Attorney-in-Fact Certificate)

(Typed or Printed Name)

() _____
(Area Code and Telephone Number of Attorney-in-Fact for Surety)

Contact name, address, telephone number and email address for notices to the Surety

(Contact Name)

(Address)

(Telephone)

(Email address)

LABOR AND MATERIAL PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS that we, _____ as Principal, and _____ as Surety, are held and firmly bound unto **CHABOT-LAS POSITAS COMMUNITY COLLEGE DISTRICT** hereinafter "the Obligee", in the penal sum of _____ Dollars (_____) in lawful money of the United States, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, the Obligee, by resolution of its Board of Trustees has awarded to the Principal a Contract for the Work described as **BID NO.: XXXXX Name of Project Here Name of College**

WHEREAS, the Principal, has entered into an Agreement with the Obligee for performance of the Work, the Agreement and all other Contract Documents set forth therein are incorporated herein by this reference and made a part hereof.

WHEREAS, by the terms of the Contract Documents, the Principal is required to furnish a bond for the prompt, full and faithful payment to any Claimant, as hereinafter defined, for all labor materials or services used, or reasonably required for use, in the performance of the Work.

NOW THEREFORE, if the Principal shall promptly, fully and faithfully make payment to any Claimant for all labor, materials or services used or reasonably required for use in the performance of the Work then this obligation shall be void otherwise, it shall be, and remain, in full force and effect.

The term "Claimant" shall refer to any person, corporation, partnership, proprietorship or other entity including without limitation, all persons and entities described in California Civil Code §3181, providing or furnishing labor, materials or services used or reasonably required for use in the performance of the Work under the Contract Documents, without regard for whether such labor, materials or services were sold, leased or rented. This Bond shall inure to the benefit of all Claimants so as to give them, or their assigns and successors, a right of action upon this Bond.

In the event suit is brought on this Bond by any Claimant for amounts due such Claimant for labor, materials or services provided or furnished by such Claimant, the Surety shall pay for the same and reasonable attorneys fees pursuant to California Civil Code §3250.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, deletion, addition, or any other modification to the terms of the Contract Documents, the Work to be performed thereunder, the Specifications or the Drawings, or any other portion of the Contract Documents, shall in any way limit, restrict or otherwise affect its obligations under this Bond the Surety hereby waives notice from the Obligee of any such change, extension of time, alteration, deletion, addition or other modification to the Contract Documents, the Work to be performed under the Contract Documents, the Drawings or the Specifications of any other portion of the Contract Documents.

IN WITNESS WHEREOF, the Principal and Surety have executed this instrument this _____ day of _____, 2021 by their duly authorized agent or representative.

(Principal's Corporate Seal)

(Principal Name)

By: _____
(Signature)

(Type or Print Name)

Title: _____

(Surety's Corporate Seal)

(Surety Name)

By: _____
(Signature of Attorney-in-Fact for Surety)

(Attach Attorney-in-Fact Certificate)

(Type or Print Name of Attorney-in-Fact)

() _____
(Area Code and Telephone Number of Attorney-in-Fact for Surety)

Contact name, address, telephone number and email address for notices to the Surety

(Contact Name)

(Address)

(Telephone)

(Email address)

THIS PAGE INTENTIONALLY BLANK

CERTIFICATE OF WORKERS' COMPENSATION INSURANCE

PROJECT: BID NO.: XXXXX Name of Project Here Name of College

I, _____ the _____ of
(Name) (Title)

_____, declare, state and certify that:
(Contractor Name)

1. I am aware that California Labor Code §3700(a) and (b) provides:

“Every employer except the state shall secure the payment of compensation in one or more of the following ways:

- (a) By being insured against liability to pay compensation in one or more insurers duly authorized to write compensation insurance in this state.
- (b) By securing from the Director of Industrial Relations a certificate of consent to self-insure either as an individual employer, or one employer in a group of employers, which may be given upon furnishing proof satisfactory to the Director of Industrial Relations of ability to self-insure and to pay any compensation that may become due to his or her employees.”

2. I am aware that the provisions of California Labor Code §3700 require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of this Contract.

(Contractor Name)

By: _____
(Signature)

(Typed or printed name)

THIS PAGE INTENTIONALLY BLANK

DRUG-FREE WORKPLACE CERTIFICATION

PROJECT: BID NO.: XXXXX Name of Project Here Name of College

I, _____, am the _____ of
(Print Name) (Title)

_____. I declare, state and certify to all of the following:
(Contractor Name).

1. I am aware of the provisions and requirements of California Government Code 8350 et seq., the Drug Free Workplace Act of 1990.
2. I am authorized to certify, and do certify, on behalf of Contractor that a drug free workplace will be provided by Contractor by doing all of the following:
 - A. Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession or use of a controlled substance is prohibited in Contractor's workplace and specifying actions which will be taken against employees for violation of the prohibition
 - B. Establishing a drug-free awareness program to inform employees about all of the following:
 - i. The dangers of drug abuse in the workplace
 - ii. Contractor's policy of maintaining a drug-free workplace
 - iii. The availability of drug counseling, rehabilitation and employee-assistance programs and
 - iv. The penalties that may be imposed upon employees for drug abuse violations
 - C. Requiring that each employee engaged in the performance of the Contract be given a copy of the statement required by subdivision (A), above, and that as a condition of employment by Contractor in connection with the Work of the Contract, the employee agrees to abide by the terms of the statement.
 - D. Contractor agrees to fulfill and discharge all of Contractor's obligations under the terms and requirements of California Government Code 8355 by, inter alia, publishing a statement notifying employees concerning: (a) the prohibition of any controlled substance in the workplace, (b) establishing a drug-free awareness program, and (c) requiring that each employee engaged in the performance of the Work of the Contract be given a copy of the statement required by California Government Code 8355(a) and requiring that the employee agree to abide by the terms of that statement.
3. Contractor and I understand that if the District determines that Contractor has either: (a) made a false certification herein, or (b) violated this certification by failing to carry out and to implement the requirements of California Government Code 8355, the Contract awarded herein is subject to termination, suspension of payments, or both. Contractor and I further understand that, should Contractor violate the terms of the Drug-Free Workplace Act of 1990, Contractor may be subject to debarment in accordance with the provisions of California Government Code 8350, et seq.
4. Contractor and I acknowledge that Contractor and I are aware of the provisions of California Government Code 8350, et seq. and hereby certify that Contractor and I will adhere to, fulfill, satisfy and discharge all provisions of and obligations under the Drug-Free Workplace Act of 1990.

I declare under penalty of perjury under the laws of the State of California that all of the foregoing is true and correct.

Executed at _____ this ____ day of _____, 2021
(City and State)

(Signature)

(Handwritten or Typed Name)

THIS PAGE INTENTIONALLY BLANK

GENERAL CONDITIONS

**GENERAL CONDITIONS
TABLE OF CONTENTS**

ARTICLE 1: DEFINITIONS; GENERAL

- 1.1 District.
- 1.2 Contractor.
- 1.3 Architect.
- 1.4 The Work.
- 1.5 The Project.
- 1.6 Surety.
- 1.7 Subcontractors Sub-Subcontractors.
- 1.8 Material Supplier.
- 1.9 Drawings and Specifications.
- 1.10 Special Conditions Supplemental Conditions.
- 1.11 Contract Documents.
- 1.12 Intent and Correlation of Contract Documents.
 - 1.12.1 Work of the Contract Documents.
 - 1.12.2 Technical Terms.
 - 1.12.3 Conflict in Contract Documents.
- 1.13 Shop Drawings Samples Product Data ("Submittals").
- 1.14 Division of State Architect ("DSA").
- 1.15 Project Inspector.
- 1.16 Contract Document Terms.
- 1.17 Contractor's Superintendent.
- 1.18 Record Drawings.
- 1.19 Construction Manager.
- 1.20 Construction Equipment.
- 1.21 Site.
- 1.22 Field Clarifications.
- 1.23 Defective or Non-Conforming Work.
- 1.24 Delivery.
- 1.25 Notice to Proceed.
- 1.26 Progress Reports Verified Reports.

ARTICLE 2: DISTRICT

- 2.1 Information Required of District.
 - 2.1.1 Surveys Site Information.
 - 2.1.2 Permits Fees.
 - 2.1.3 Drawings and Specifications.
 - 2.1.4 Furnishing of Information.
- 2.2 District's Right to Stop the Work.
- 2.3 Partial Occupancy or Use.
 - 2.3.1 District's Right to Partial Occupancy.
 - 2.3.2 No Acceptance of Defective or Nonconforming Work.
- 2.4 The Project Inspector.

- 2.4.1 Access to Work.
- 2.4.2 Limitations on Project Inspector.

ARTICLE 3: ARCHITECT; CONSTRUCTION MANAGER

- 3.1 Administration of the Contract.
 - 3.1.1 Role of the Architect and Construction Manager.
 - 3.1.2 Architect's Periodic Site Inspections.
 - 3.1.3 Contractor Responsibility for Construction Means, Methods and Sequences.
 - 3.1.4 Review of Applications for Payment.
 - 3.1.5 Rejection of Work.
 - 3.1.6 Submittals.
 - 3.1.6.1 Processing of Submittals Through Construction Manager.
 - 3.1.6.2 Architect's Review.
 - 3.1.6.3 Time for Architect's Review.
 - 3.1.7 Changes to the Work Change Orders.
 - 3.1.8 Completion.
 - 3.1.9 Interpretation of Contract Documents Architect as Initial Arbiter of Disputes.
 - 3.1.10 Request for Information.
 - 3.1.11 Detail Drawings and Instructions.
 - 3.1.11.1 Architect's Additional Details.
 - 3.1.11.2 Contractor Notice of Impacts.
- 3.2 Communications Role of Construction Manager and Architect.
- 3.3 Termination of Architect Substitute Architect or Construction Manager.

ARTICLE 4: THE CONTRACTOR

- 4.1 Contractor Review of Contract Documents.
 - 4.1.1 Examination of Contract Documents.
 - 4.1.2 Field Measurements.
 - 4.1.3 Dimensions Layouts and Field Engineering.
 - 4.1.4 Work in Accordance with Contract Documents.

- 4.2 Site Investigation Subsurface Conditions.
 - 4.2.1 Contractor Investigation.
 - 4.2.2 Subsurface Data.
 - 4.2.3 Subsurface Conditions.
- 4.3 Supervision and Construction Procedures.
 - 4.3.1 Supervision of the Work.
 - 4.3.2 Responsibility for the Work.
 - 4.3.3 Layouts.
 - 4.3.4 Construction Utilities.
 - 4.3.5 Existing Utilities Removal, Relocation and Protection.
 - 4.3.6 Conferences and Meetings.
 - 4.3.6.1 Pre-Construction Conference.
 - 4.3.6.2 Progress Meetings.
 - 4.3.6.3 Special Meetings.
 - 4.3.6.4 Minutes of Meetings.
 - 4.3.7 Temporary Sanitary Facilities.
 - 4.3.8 Noise and Dust Control.
 - 4.3.8.1 Noise Control.
 - 4.3.8.2 Dust Control.
 - 4.3.8.3 Contractor Failure to Comply.
 - 4.3.9 Debris Recycling Statement.
- 4.4 Labor and Materials.
 - 4.4.1 Payment for Labor, Materials and Services.
 - 4.4.2 Employee Discipline.
 - 4.4.3 Contractors' Superintendent.
 - 4.4.4 Prohibition on Harassment.
 - 4.4.4.1 District's Policy Prohibiting Harassment.
 - 4.4.4.2 Contractor's Adoption of Anti-Harassment Policy.
 - 4.4.4.3 Prohibition on Harassment at the Site.
- 4.5 Taxes.
- 4.6 Permits, Fees and Notices Compliance With Laws.
 - 4.6.1 Payment of Permits, Fees.
 - 4.6.2 Compliance With Laws.
 - 4.6.3 Notice of Variation from Laws.
- 4.7 Submittals.
 - 4.7.1 Purpose of Submittals.
 - 4.7.2 Contractor's Submittals.
 - 4.7.2.1 Prompt Submittals.
 - 4.7.2.2 Approval of Subcontractor Submittals.
 - 4.7.2.3 Verification of Submittal Information.
 - 4.7.2.4 Contractor Responsibility for Deviations.
 - 4.7.2.5 No Performance of Work Without Architect Review.
 - 4.7.3 Architect Review of Submittals.
 - 4.7.4 Deferred Approval Items.
- 4.8 Materials and Equipment.
 - 4.8.1 Specified Materials, Equipment.
 - 4.8.2 Approval of Substitutions or Alternatives.
 - 4.8.3 "Sole Source" Products.
 - 4.8.4 Placement of Material and Equipment Orders.
 - 4.8.5 District's Right to Place Orders for Materials and/or Equipment.
- 4.9 Safety.
 - 4.9.1 Safety Programs.
 - 4.9.2 Safety Precautions.
 - 4.9.3 Safety Signs, Barricades.
 - 4.9.4 Safety Notices.
 - 4.9.5 Safety Coordinator.
 - 4.9.6 Emergencies First Aid.
 - 4.9.7 Hazardous Materials.
 - 4.9.7.1 General.
 - 4.9.7.2 Prohibition on Use of Asbestos Construction Building Materials ("ACBMs").
 - 4.9.7.3 Disposal of Hazardous Materials.
- 4.10 Maintenance of Documents.
 - 4.10.1 Documents at Site.
 - 4.10.2 Maintenance of Record Drawings.
- 4.11 Use of Site.
- 4.12 Clean-Up.
- 4.13 Access to the Work.
- 4.14 Information and Facilities/Services for the Project Inspector.
- 4.15 Patents and Royalties.
- 4.16 Cutting and Patching.
- 4.17 Encountering of Hazardous Materials.
- 4.18 Wage Rates Employment of Labor.
 - 4.18.1 Determination of Prevailing Rates.
 - 4.18.2 Payment of Prevailing Rates.
 - 4.18.3 Prevailing Rate Penalty.
 - 4.18.4 Payroll Records.
 - 4.18.5 Hours of Work.
 - 4.18.5.1 Limits on Hours of Work.
 - 4.18.5.2 Penalty for Excess Hours.
 - 4.18.5.3 Contractor Responsibility.
 - 4.18.6 Apprentices.

- 4.18.6.1 Employment of Apprentices.
- 4.18.6.2 Apprenticeship Certificate.
- 4.18.6.3 Ratio of Apprentices to Journeymen.
- 4.18.6.4 Exemption from Ratios.
- 4.18.6.5 Contribution to Trust Funds.
- 4.18.6.6 Contractor’s Compliance.
- 4.18.7 Employment of Independent Contractors.
- 4.19 Assignment of Antitrust Claims.
- 4.20 Limitations Upon Site Activities.
- 4.21 Labor Compliance Program (“LCP”)
 - 4.21.1 Pre-Construction Conference.
 - 4.21.2 Maintenance and Weekly Submission of Certified Payroll Records.
 - 4.21.3 District Audit of Certified Payroll Records.
 - 4.21.4 Contractor’s Rights Upon Determination of Violation.
 - 4.21.5 LCP Not Exclusive.
- 4.22 State Audit.

ARTICLE 5: SUBCONTRACTORS

- 5.1 Subcontracts.
- 5.2 Substitution of Listed Subcontractor.
 - 5.2.1 Substitution Process.
 - 5.2.2 Responsibility of Contractor Upon Substitution of Subcontractor.
- 5.3 Subcontractors’ Work.
- 5.4 Subcontractors’ Compliance With LCP.

ARTICLE 6: INSURANCE; INDEMNITY; BONDS

- 6.1 Workers’ Compensation Insurance; Employer’s Liability Insurance.
- 6.2 Commercial General Liability and Property Insurance.
- 6.3 Builder’s Risk “All-Risk” Insurance.
- 6.4 Insurance Policy Requirements.
 - 6.4.1 Minimum Coverage Amounts.
 - 6.4.2 Required Qualifications of Insurers.
- 6.5 Evidence of Insurance Subcontractor’s Insurance.
 - 6.5.1 Certificates of Insurance.
 - 6.5.2 Subcontractors’ Insurance.
- 6.6 Maintenance of Insurance.
- 6.7 Contractor’s Insurance Primary.
- 6.8 Indemnity.
- 6.9 Payment Bond Performance Bond.

ARTICLE 7: CONTRACT TIME

- 7.1 Substantial Completion of the Work Within Contract Time.
- 7.2 Progress and Completion of the Work.
 - 7.2.1 Time of Essence.
 - 7.2.2 Substantial Completion.
 - 7.2.3 Correction or Completion of the Work After Substantial Completion.
 - 7.2.3.1 Punchlist.
 - 7.2.3.2 Time for Completing Punchlist Items.
 - 7.2.4 Final Completion.
 - 7.2.5 Contractor Responsibility for Multiple Inspections.
 - 7.2.6 Final Acceptance.
- 7.3 Construction Schedule.
 - 7.3.1 General Construction Schedule Requirements.
 - 7.3.2 Submittal of Preliminary Construction Schedule.
 - 7.3.3 Review of Preliminary Construction Schedule.
 - 7.3.4 Preparation of Submittal of Contract Construction Schedule.
 - 7.3.5 Revisions to Accepted Construction Schedule.
 - 7.3.6 Updates to Accepted Construction Schedule.
 - 7.3.6.1 Updated Construction Schedule Requirements.
 - 7.3.6.2 Monthly Submission of Updated Construction Schedule.
 - 7.3.7 Contractor Responsibility for Construction Schedule.
 - 7.3.8 Three (3) Week Look-Ahead Schedule One (1) Week As Built Schedule.
 - 7.3.9 Unanticipated Unusually Severe Weather Conditions.
 - 7.3.10 Construction Schedules Conditions Precedent To Progress Payment Disbursements.
 - 7.3.11 Contractor Schedule Compliance Obligations.
- 7.4 Adjustment to Contract Time.
 - 7.4.1 Excusable Delays.
 - 7.4.2 Compensable Delays.
 - 7.4.3 Unexcusable Delays.

- 7.4.4 Adjustment of Contract Time.
 - 7.4.4.1 Procedure for Adjustment of Contract Time.
 - 7.4.4.1.1 Contractor Notice of Adjustment of Contract Time.
 - 7.4.4.1.2 Time Impact Evaluation.
 - 7.4.4.2 Limitations Upon Adjustment of Contract Time on Account of Delays.
- 7.5 Liquidated Damages.
- 7.6 District Right to Take-Over Work.

ARTICLE 8: CONTRACT PRICE

- 8.1 Contract Price.
- 8.2 Cost Breakdown.
- 8.3 Progress Payments.
 - 8.3.1 Applications for Progress Payments.
 - 8.3.2 Initial Progress Payment Meeting.
 - 8.3.3 District’s Review of Applications for Progress Payments.
 - 8.3.4 Review of Applications for Progress Payments.
 - 8.3.5 District’s Disbursement of Progress Payments.
 - 8.3.5.1 Timely Distribution of Progress Payments.
 - 8.3.5.2 Untimely Disbursement of Progress Payments.
 - 8.3.5.3 District’s Right to Disburse Progress Payments by Joint Checks.
 - 8.3.5.4 No Waiver of Defective or Non-Conforming Work.
 - 8.3.6 Progress Payments for Changed Work.
 - 8.3.7 Materials or Equipment Not Incorporated into the Work.
 - 8.3.7.1 Limitations Upon Payment.
 - 8.3.7.2 Materials or Equipment Delivered and Stored at the Site.
 - 8.3.7.3 Materials or Equipment Not Delivered or Stored at the Site.
 - 8.3.7.4 Materials or Equipment in Fabrication or Transit.
 - 8.3.8 Exclusions from Progress Payments.

- 8.3.9 Title to Work.
- 8.3.10 Substitute Security for Retention.
- 8.4 Final Payment.
 - 8.4.1 Application for Final Payment.
 - 8.4.2 Conditions Precedent to Disbursement of Final Payment.
 - 8.4.3 Disbursement of Final Payment.
 - 8.4.4 Waiver of Claims.
 - 8.4.5 Claims Asserted After Final Payment.
- 8.5 Withholding of Payments.
- 8.6 Payments to Subcontractors.
- 8.7 Computerized Job Cost Reporting System.
 - 8.7.1 Job Cost Reporting.
 - 8.7.2 Job Cost Reporting System Requirements.
 - 8.7.3 Job Cost System Information.

ARTICLE 9: CHANGES

- 9.1 Changes in the Work.
- 9.2 Oral Order of Change in the Work.
- 9.3 Contractor Submittal of Data.
- 9.4 Adjustment to Contract Price and Contract Time on Account of Changes to the Work.
 - 9.4.1 Adjustment to Contract Price.
 - 9.4.1.1 Mutual Agreement.
 - 9.4.1.2 Determination by the District.
 - 9.4.1.3 Basis for Adjustment of Contract Price.
 - 9.4.1.3.1 Labor.
 - 9.4.1.3.2 Materials and Equipment.
 - 9.4.1.3.3 Construction Equipment.
 - 9.4.1.3.4 Mark-up on Costs of Changes to the Work.
 - 9.4.1.4 Contractor Maintenance of Records.
 - 9.4.2 Adjustments to Contract Time.
 - 9.4.3 Addition or Deletion of Alternate Bid Item(s).
- 9.5 Change Orders.
- 9.6 Contractor Notice of Changes.
- 9.7 Disputed changes.
- 9.8 Emergencies.
- 9.9 Minor Changes in the Work.
- 9.10 Unauthorized Changes.

ARTICLE 10: SEPARATE CONTRACTORS

- 10.1 District’s Right to Award Separate Contracts.
- 10.2 District’s Coordination of Separate Contractors.
- 10.3 Mutual Responsibility.
- 10.4 Discrepancies or Defects.

ARTICLE 11: TESTS AND INSPECTIONS

- 11.1 Tests Inspections Observations.
 - 11.1.1 Contractor’s Notice.
 - 11.1.2 Costs of Tests and Inspections.
 - 11.1.3 Testing/Inspection Laboratory.
 - 11.1.4 Additional Tests, Inspections and Approvals.
- 11.2 Delivery of Certificates.
- 11.3 Timeliness of Tests, Inspections and Approvals.

ARTICLE 12: UNCOVERING AND CORRECTION OF WORK

- 12.1 Inspection of the Work.
 - 12.1.1 Access to the Work.
 - 12.1.2 Limitations Upon Inspections.
- 12.2 Uncovering of Work.
- 12.3 Rejection of Work.
- 12.4 Correction of Work.
- 12.5 Removal of Non-Conforming or Defective Work.
- 12.6 Failure of Contractor to Correct Work.
- 12.7 Acceptance of Defective or Non-Conforming Work.

ARTICLE 13: WARRANTIES

- 13.1 Workmanship and Materials.
- 13.2 Warranty Work.
- 13.3 Guarantee.
- 13.4 Survival of Warranties.

ARTICLE 14: SUSPENSION OF WORK

- 14.1 District’s Right to Suspend Work.
- 14.2 Adjustments to Contract Price and Contract Time.

ARTICLE 15: TERMINATION

- 15.1 Termination for Cause.
 - 15.1.1 District’s Right to Terminate.
 - 15.1.2 District’s Rights Upon Termination.
 - 15.1.3 Completion by the Surety.

- 15.1.4 Assignment and Assumption of Subcontracts.
- 15.1.5 Costs of Completion.
- 15.1.6 Contractor Responsibility for Damages.
- 15.1.7 Conversion to Termination for Convenience.
- 15.1.8 District’s Rights Cumulative.
- 15.2 Termination for Convenience of the District.

ARTICLE 16: MISCELLANEOUS

- 16.1 Governing Law.
- 16.2 Marginal Headings Interpretation.
- 16.3 Successors and Assigns.
- 16.4 Cumulative Rights and Remedies No Waiver.
- 16.5 Severability.
- 16.6 No Assignment by Contractor.
- 16.7 Gender and Number.
- 16.8 Independent Contractor Status.
- 16.9 Notices.
- 16.10 Disputes Continuation of Work.
- 16.11 Dispute Resolution Arbitration.
 - 16.11.1 Claims Under 375,000.00.
 - 16.11.2 Government Code Claim Requirements.
 - 16.11.3 Arbitration.
 - 16.11.4 Inapplicability to Bid Bond.
- 16.12 Capitalized Terms.
- 16.13 Attorneys Fees.
- 16.14 Waiver of Special/Consequential Damages.
- 16.15 Provisions Required by Law Deemed Inserted.
- 16.16 Days.
- 16.17 Prohibited Interests.
- 16.18 Entire Agreement.

GENERAL CONDITIONS

ARTICLE 1: DEFINITIONS; GENERAL

- 1.1 District.** The “District” refers to CHABOT-LAS POSITAS COMMUNITY COLLEGE DISTRICT and unless otherwise stated, includes the District's authorized representatives, including the Construction Manager, if a Construction Manager is designated, the District's Board of Trustees and the District’s officers, employees, agents and representatives.
- 1.2 Contractor.** The Contractor is the person or entity identified as such in the Agreement references to “Contractor” include the Contractor's authorized representative.
- 1.3 Architect.** The Architect is the person or entity identified as such in the Agreement references to the “Architect” include the Architect's authorized representative.
- 1.4 The Work.** The “Work” is the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment or services provided or to be provided by the Contractor to fulfill the Contractor's obligations under the Contract Documents. The Work may constitute the whole or a part of the Project.
- 1.5 The Project.** The Project is the total construction of which the Work performed by the Contractor under the Contract Documents which may be the whole or a part of the Project and which may include construction by the District or by separate contractors.
- 1.6 Surety.** The Surety is the person or entity that executes, as surety, the Contractor's Labor and Material Payment Bond and/or Performance Bond.
- 1.7 Subcontractors; Sub-Subcontractors.** A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work. “Subcontractor” does not include a separate contractor to the District or subcontractors of any separate contractor. A Sub-Subcontractor is a person or entity of any tier, who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site.
- 1.8 Material Supplier.** A Material Supplier is any person or entity who only furnishes materials, equipment or supplies for the Work without fabricating, installing or consuming them in the Work.
- 1.9 Drawings and Specifications.** The Drawings are the graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, showing generally, the design, location and dimensions of the Work and may include without limitation, plans, elevations, sections, details, schedules or diagrams. The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards, criteria and workmanship for the Work and related services. The Drawings and Specifications are intended to delineate and describe the Work and its component parts so as to permit skilled and competent contractors to bid upon the Work and prosecute the same to completion. Large scale Drawings shall take precedence over smaller scale Drawings as to shape and details of construction. Figured dimensions on Drawings shall govern, but Work which is not dimensioned shall be as directed or required by field conditions. Specifications shall govern as to materials, workmanship and installation procedures.

1.10 Special Conditions; Supplemental Conditions. If made a part of the Contract Documents, Special Conditions and Supplemental Conditions are special or supplemental provisions, not otherwise provided for in the Agreement or the General Conditions.

1.11 Contract Documents. The Contract Documents consist of the Agreement between the District and the Contractor, Conditions of the Contract (whether General, Special, Supplemental or otherwise), Drawings, Specifications, including addenda thereto issued prior to execution of the Agreement and any other documents listed in the Agreement. The Contract Documents shall include modifications issued after execution of the Agreement. The Contract Documents form the Contract for Construction.

1.12 Intent and Correlation of Contract Documents.

1.12.1 Work of the Contract Documents. The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary and what is required by one shall be as binding as if required by all performance by the Contractor shall be required to the extent consistent with the Contract Documents and reasonably inferable therefrom as being necessary to produce the intended results. Organization of the Specifications into divisions, sections or articles, and the arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade. Where any portion of the Contract Documents is silent and information appears elsewhere in the Contract Documents, such other portions of the Contract Documents shall control.

1.12.2 Technical Terms. Unless otherwise stated in the Contract Documents, words or terms which have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

1.12.3 Conflict in Contract Documents. Conflicts, inconsistencies or ambiguities in the Contract Documents shall be resolved by the Architect in accordance with Article 3.1.9 of the General Conditions where conflicts or inconsistencies arise between the Drawings and the Specifications, in resolving such conflicts or inconsistencies, the Architect will be governed generally by the following standards: the Drawings are intended to describe matters relating to placement, type, quantity and the like the Specifications are intended to describe matters relating to quality, materials, compositions, manufacturers and the like. If conflicts exist between portions of the Contract Documents regarding the quality of any item, product, equipment or materials, unless otherwise directed or authorized by the District, the Contractor shall provide the item, product, equipment or material of the highest or more stringent quality.

1.13 Shop Drawings; Samples; Product Data (“Submittals”). Shop Drawings are diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-Subcontractor, manufacturer, Material Supplier, or distributor to illustrate some portion of the Work. Samples are physical examples of materials, equipment or workmanship forming a part of, or to be incorporated into the Work. Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work. Shop Drawings, Samples and Product Data prepared or furnished by the

Contractor or any of its Subcontractors or Material Suppliers are collectively referred to as "Submittals".

- 1.14 Division of State Architect ("DSA").** The DSA is the California Division of the State Architect including without limitation the DSA's Office of Construction Services, Office of Design Services and the Office of Regulatory Services references to the DSA in the Contract Documents shall mean the DSA, its offices and its authorized employees and agents. The authority of the DSA over the Work and the performance thereof shall be as set forth in the Contract Documents and Title 24 of the California Code of Regulations.
- 1.15 Project Inspector.** The Project Inspector is the individual designated and employed by the District in accordance with the requirements of Title 24 of the California Code of Regulations. The Project Inspector shall be authorized to act on behalf of the District as provided for in the Contract Documents and in Title 24 of the California Code of Regulations, as the same may be amended from time to time.
- 1.16 Contract Document Terms.** The term "provide" means "provide complete in place" or to "furnish and install" such item. Unless otherwise provided in the Contract Documents, the terms "approved;" "directed;" "satisfactory;" "accepted;" "acceptable;" "proper;" "required;" "necessary" and "equal" shall mean as approved, directed, satisfactory, accepted, acceptable, proper, required, necessary and equal, in the opinion of the Architect. The term "typical" as used in the Drawings shall require the installation or furnishing of such item(s) of the Work designated as "typical" in all other areas similarly marked as "typical"; Work in such other areas shall conform to that shown as "typical" or as reasonably inferable therefrom.
- 1.17 Contractor's Superintendent.** The Contractor's Superintendent is the individual employed by the Contractor whose principal responsibility shall be the supervision and coordination of the Work the Contractor's Superintendent shall not perform routine construction labor.
- 1.18 Record Drawings.** The Record Drawings are a set of the Drawings marked by the Contractor during the performance of the Work to indicate completely and accurately the actual as-built condition of the Work. The Record Drawings shall be sufficient for a capable and qualified draftsman to modify the Drawings to reflect and indicate the Work actually in place at Final Completion of the Work.
- 1.19 Construction Manager.** The Construction Manager is an independent contractor retained by the District and is authorized and empowered to act on behalf of the District as set forth in the Contract Documents. The District reserves the right to remove or replace the Construction Manager prior to completion of the Work without adjustment of the Contract Price or the Contract Time or otherwise affect, limit or restrict Contractor's obligations hereunder.
- 1.20 Construction Equipment.** "Construction Equipment" is equipment utilized for the performance of any portion of the Work, but which is not incorporated into the Work.
- 1.21 Site.** The Site is the physical area designated in the Contract Documents for Contractor's performance, construction and installation of the Work.
- 1.22 Field Clarifications.** A written or graphic document consisting of supplementary details, instructions or information issued on behalf of the District which clarifies or supplements the Contract Documents and which becomes a part of the Contract Documents upon issuance. Field Clarifications do not constitute an adjustment of the Contract Time or the Contract Price,

unless a Change Order relating to a Field Clarification is authorized and issued under the Contract Documents.

- 1.23 Defective or Non-Conforming Work.** Defective or non-conforming Work is any Work which is unsatisfactory, faulty or deficient by: (a) not conforming to the requirements of the Contract Documents (b) not conforming to the standards of workmanship of the applicable trade or industry (c) not being in compliance with the requirements of any inspection, reference, standard, test, or approval required by the Contract Documents or (d) damage occurring prior to Final Completion of all of the Work.
- 1.24 Delivery.** The term “delivery” used in conjunction with any equipment, materials or other items to be incorporated into the Work shall mean the unloading and storage in a protected condition pending incorporation into the Work.
- 1.25 Notice to Proceed.** The Notice to Proceed is the written notice issued by or on behalf of the District to the Contractor authorizing the Contractor to proceed with commencement of the Work and which establishes the date for commencement of the Contract Time.
- 1.26 Progress Reports; Verified Reports.** Progress Reports, if required, are written reports prepared by the Contractor and periodically submitted to the District in the form and content as required by the Contract Documents. Verified Reports are periodic written reports prepared by the Contractor and submitted to the DSA. Verified Reports shall be in such form and content as required by the applicable provisions of Title 24 of the California Code of Regulations. A material obligation of the Contractor is the preparation of complete and accurate Progress Reports, if required, and Verified Reports as well as the timely submission of the same.

ARTICLE 2: DISTRICT

2.1 Information Required of District.

- 2.1.1 Surveys; Site Information.** Information, if any, concerning physical characteristics of the Site, including without limitation, surveys, soils reports, and utility locations, to be provided by the District are set forth in the Contract Documents. Information not provided by the District or necessary information in addition to that provided by the District concerning physical characteristics of the Site which is required shall be obtained by Contractor without adjustment to the Contract Price or the Contract Time.
- 2.1.2 Permits; Fees.** Except as otherwise provided in the Contract Documents, the District shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities which relate to the Work of the Contractor under the Contract Documents. If permits and fees are designated as the responsibility of the Contractor under the Contract Documents, the Contractor shall be solely responsible for obtaining the same the cost of such permits or fees and any costs incurred by the Contractor in obtaining such permits shall be included within the Contract Price.
- 2.1.3 Drawings and Specifications.** Except as otherwise provided for in the Contract Documents, the District shall furnish the Contractor, free of charge, the number of copies of the Drawings and the Specifications as set forth in the Special Conditions. All of the

Drawings and the Specifications provided by the District to the Contractor remain the property of the District the Contractor shall not use the Drawings or the Specifications in connection with any other work of improvement other than the Work of the Project.

2.1.4 Furnishing of Information. Information or services to be provided by the District under the Contract Documents shall be furnished by the District with reasonable promptness to avoid delay in the orderly progress of the Work. Information about existing conditions furnished by the District under the Contract Documents is obtained from sources believed to be reliable, but the District neither guarantees nor warrants that such information is complete and accurate. The Contractor shall verify all information provided by the District. To the extent that the Contract Documents depict existing conditions on or about the Site, or the Work involves the renovation, removal or remodeling of existing improvements or the Work involves any tie-in or other connection with any existing improvements, the conditions and/or existing improvements depicted in the Contract Documents are as they are believed to exist. Contractor shall bear the risk of any variations between conditions or existing improvements depicted in the Contract Documents and those conditions or existing improvements actually encountered in the performance of the Work. Subject to the provisions of Article 4.2.3, the existence of any variations between conditions or existing improvements depicted in the Contract Documents and those actually encountered in the performance of the Work shall not result in any District liability therefor, nor shall any such variations result in an adjustment of the Contract Time or the Contract Price.

2.2 District's Right to Stop the Work. In addition to the District's right to suspend the Work or terminate the Contract pursuant to the Contract Documents, the District, may, by written order, direct the Contractor to stop the Work, or any portion thereof, until the cause for such stop work order has been eliminated if the Contractor. If the Contractor fails within seven (7) days to correct Work which is not in conformity and in accordance with the requirements of the Contract Documents, or (ii) otherwise fails to carry out the Work in conformity and accordance with the Contract Documents, the District reserves the right to remedy such action. The right of the District to stop the Work hereunder shall not be deemed a duty on the part of the District to exercise such right for the benefit of the Contractor or any other person or entity, nor shall the District's exercise of such right waive or limit the exercise of any other right or remedy of the District under the Contract Documents or at law.

2.3 Partial Occupancy or Use.

2.3.1 District's Right to Partial Occupancy. The District may occupy or use any completed or partially completed portion of the Work, provided that: (i) the District has obtained the consent of, or is otherwise authorized by, public authorities with jurisdiction thereof, to so occupy or use such portion of the Work and (ii) the District and the Contractor have accepted, in writing, the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, utilities, damage to the Work, insurance and the period for correction of the Work and commencement of warranties required by the Contract Documents for such portion of the Work partially used or occupied by the District. If the Contractor and the District are unable to agree upon the matters set forth in (ii) above, the District may nevertheless use or occupy any portion of the Work, with the responsibility for such matters subject to resolution in accordance with the Contract Documents. Immediately prior to such partial occupancy or use of the Work, or portions thereof, the District, the Project Inspector, the Contractor and the Architect shall jointly inspect the portions of the Work to be occupied or to be used to determine and record the condition of

the Work. Repairs, replacements or other corrective action noted in such inspection shall be promptly performed and completed by the Contractor so that the portion of the Work to be occupied or used by the District is in conformity with the requirements of the Contract Documents and the District's occupancy or use thereof is not impaired. The District's use or occupancy of the Work or portions thereof pursuant to the preceding shall not be deemed "completion" of the Work as that term is used in Public Contract Code §7107.

2.3.2 No Acceptance of Defective or Nonconforming Work. Unless otherwise expressly agreed upon by the District and the Contractor, the District's partial occupancy or use of the Work or any portion thereof, shall not constitute the District's acceptance of the Work not complying with the requirements of the Contract Documents or which is otherwise defective.

2.4 The Project Inspector. In addition to the authority and rights of the Project Inspector as provided for elsewhere in the Contract Documents, all of the Work shall be performed under the observation of the Project Inspector. The performance of the duties of the Project Inspector under the Contract Documents shall not relieve or limit the Contractor's performance of its obligations under the Contract Documents.

2.4.1 Access to Work. The Contractor shall provide the Project Inspector with access to all parts of the Work at any time, wherever located and whether partially or completely fabricated, manufactured, furnished or installed. The Project Inspector shall have the authority to stop Work if the Work is not in conformity with the Contract Documents.

2.4.2 Limitations on Project Inspector. The Project Inspector does not have authority to interpret the Contract Documents or to modify the Work depicted in the Contract Documents. No Work inconsistent with the Contract Documents shall be performed solely on the basis of the direction of the Project Inspector, and the Contractor shall be liable to the District for the consequences of all Work performed on such basis.

ARTICLE 3: ARCHITECT; CONSTRUCTION MANAGER

3.1 Administration of the Contract.

3.1.1 Role of the Architect and Construction Manager. The Architect and the Construction Manager will provide administration of the Contract as described in the Contract Documents, and will be the District's representatives during construction until the time that Final Payment is due the Contractor under the Contract Documents. The Architect and Construction Manager will advise and consult with the District and the Project Inspector with respect to the administration of the Contract and the Work. The Architect is authorized to act on behalf of the District to the extent provided for in the Contract Documents and shall have the responsibilities and powers established by law, including Title 24 of the California Code of Regulations. The Architect and Construction Manager are authorized to stop the Work whenever deemed necessary in the sole discretion of the Architect or the Construction Manager to insure that the Work is completed in accordance with the Contract Documents.

3.1.2 Architect's Periodic Site Visits. The Architect will visit the Site at intervals appropriate to the stage of construction to become generally familiar with the progress and quality of the completed Work and to determine, in general, if the Work is being performed in a manner indicating that the Work, when completed, will be in accordance with the Contract

Documents. The Architect will not be required to make exhaustive or continuous Site inspections to check quality or quantity of the Work. On the basis of Site observations as an architect, the Architect will keep the District informed of the progress of the Work, and will endeavor to guard the District against defects and deficiencies in the Work.

3.1.3 Contractor Responsibility for Construction Means, Methods and Sequences.

Neither the Architect or the Construction Manager will have control over or charge of and be responsible for construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, these being solely the Contractor's responsibility. Neither the Architect nor Construction Manager will have control over or charge of and be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or of any other persons performing portions of the Work.

3.1.4 Review of Applications for Payment. In accordance with Article 8 hereof, the Architect and Construction Manager will review the Contractor's Applications for Progress Payments and for Final Payment, evaluate the extent of Work performed and the amount properly due the Contractor on such Application for Payment.

3.1.5 Rejection of Work. The Architect is authorized to reject Work which is defective or does not conform to the requirements of the Contract Documents. Whenever the Architect considers it necessary or advisable, for implementation of the intent of the Contract Documents, the Architect will have authority to require additional inspections or testing of the Work, whether or not such Work is fabricated, installed or completed. Neither this authority of the Architect nor a decision made in good faith by the Architect to exercise or not to exercise such authority shall give rise to a duty or responsibility to the Contractor, Subcontractors, Material Suppliers, their agents or employees, or other persons performing portions of the Work.

3.1.6 Submittals.

3.1.6.1 Processing of Submittals Through Construction Manager. Submittals required by the Contract Documents shall be prepared by or on behalf of the Contractor in accordance with the requirements of the Contract Documents. Submittals shall be transmitted by the Contractor to the Construction Manager for distribution by the Construction Manager to the Architect and the District. Upon completion of the Architect's review of a Submittal, the Construction Manager shall transmit the reviewed Submittal to the Contractor for the Contractor's distribution to its Subcontractor(s) and other affected parties.

3.1.6.2 Architect's Review. The Architect will review and approve or take other appropriate action upon the Contractor's Submittals, but only for the limited purpose of checking for general conformance with information given and the design concept expressed in the Contract Documents. Review of Submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's Submittals shall not relieve the Contractor of its obligations under the Contract Documents. The Architect's review of Submittals shall not constitute approval of safety measures, programs or precautions or, unless otherwise

specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item in a Submittal shall not indicate approval of an assembly of which the item is a component with the Submittal(s) required and relating to such assembly have been reviewed by the Architect.

3.1.6.3 Time for Architect's Review. The Architect's review of Submittals will be conducted promptly so as not to delay or hinder the progress of the Work or the activities of the Contractor, the District or the District's separate contractors while allowing sufficient time, in the Architect's reasonable professional judgment, to permit adequate review of Submittals. The foregoing notwithstanding, the Architect's review and return of Submittals will conform with the time limits and other conditions, if any, set forth in the Specifications or the Submittal Schedule if the Submittal Schedule is required by other provisions of the Contract Documents.

3.1.7 Changes to the Work; Change Orders. The Architect and Construction Manager will prepare Change Orders, and with the written approval of the District, may authorize minor Changes in the Work which do not result in adjustment of the Contract Time or the Contract Price.

3.1.8 Completion. The Architect will conduct observations to determine the date(s) of Substantial Completion and the date(s) of Final Completion, will receive and forward to the District, for the District's review and records, written warranties and related documents required by the Contract Documents and assembled by the Contractor, and will verify that the Contractor has complied with all requirements of the Contract Documents and is entitled to receipt of Final Payment.

3.1.9 Interpretation of Contract Documents; Architect as Initial Arbiter of Disputes. The Architect will interpret and decide matters concerning the requirements of the Contract Documents on written request of either the District or the Contractor. The Architect's response to such requests will be made with reasonable promptness and within the time limits agreed upon, if any. If no agreement is reached establishing the time for the Architect's review and response to requests under this Article 3.1.9, the Architect shall be afforded a fifteen (15) day period after receipt of such request to review and respond thereto. Interpretations and decisions of the Architect will be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both the District and the Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions so rendered in good faith. The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents. If there is any disagreement, dispute or other matter in controversy between the District and the Contractor, in addition to other requirements established by the Contract Documents or by law, the submission of the same to the Architect for its decision shall be a condition precedent to initiation of dispute resolution procedures.

3.1.10 Request for Information. If the Contractor encounters any condition which the Contractor believes, in good faith and with reasonable basis, is the result of an ambiguity, conflict, error or omission in the Contract Documents (collectively "the Conditions"), it shall be affirmative obligation of the Contractor to timely notify the Architect, in writing, of the Conditions encountered and to request information from the Architect necessary to

address and resolve any such Conditions before proceeding with any portion of the Work affected or which may be affected by such Conditions. If the Contractor fails to timely notify the Architect in writing of any Conditions encountered and the Contractor proceeds to perform any portion of the Work containing or affected by such Conditions the Contractor shall bear all costs associated with or required to correct, remove, or otherwise remedy any portion of the Work affected thereby without adjustment of the Contract Time or the Contract Price. In requesting information of the Architect to address and resolve any Conditions the Contractor shall act with promptness in submitting any such written request so as to allow the Architect a reasonable period of time to review, evaluate and respond to any such request, taking into account the then current status of the progress and completion of the Work and the actual or potential impact of any such Conditions upon the completion of the Work within the Contract Time. The Contract Time shall not be subject to adjustment in the event that the Contractor shall fail to timely request information from the Architect. The Architect's responses to any such Contractor request for information shall conform to the standards and time frame set forth in Article 3.1.9 of these General Conditions. The foregoing provisions notwithstanding, in the event that the Architect reasonably determines that any of Contractor's request(s) for information: (i) does not reflect adequate or competent supervision or coordination by the Contractor or any Subcontractor or (ii) does not reflect the Contractor's adequate or competent knowledge of the requirements of the Work or the Contract Documents or (iii) is not justified for any other reason, Contractor shall be liable to the District for all costs incurred by the District associated with the processing, reviewing, evaluating and responding to any such request for information, including without limitation, fees of the Architect and any other design consultant to the Architect or the District. In responding to any of Contractor's request(s) for information, the Architect shall, in the response, indicate if the Architect has made the determination pursuant to the preceding sentence and, if so, the amount of costs to be borne by the Contractor for the processing, review, evaluation and response to the request for information. Thereafter, the District is authorized to deduct such amount from any portion of the Contract Price then or thereafter due the Contractor.

3.1.11 Detail Drawings and Instructions.

3.1.11.1 Architect's Additional Details. In case of ambiguity, conflict, or lack of information, Architect shall furnish additional instructions by means of drawings or otherwise, necessary for proper execution of the Work. All such drawings and instructions shall be consistent with Contract Documents, true developments thereof, and reasonably inferable therefrom. Such additional instructions shall be furnished with reasonable promptness, but not more than fourteen (14) days, provided that Contractor informs Architect and District in writing of the relationship of the requested critical path of the Construction Schedule. Architect will furnish necessary additional details to more fully explain the Work, which details shall be deemed part of the Contract Documents.

3.1.11.2 Contractor Notice of Impacts. If the Contractor believes that detail drawings issued by the Architect reflects a change to the scope of work or additional work beyond that reflected in the Contract Documents or reasonably referable therefrom, the Contractor shall give written notice thereof to Architect and District within five (5) days of the receipt of same. If the Contractor does not give the Architect and District such written notice within five (5) days, the details shall be deemed to be reasonable development of the Work depicted in the Contract Documents without adjustment of the Contract Time or the Contract Price. If notice is given by the Contractor, the

Contractor shall set forth in detail the extent of Contract Price or Contract Time adjustments resulting from such details along with the basis upon which the requested Contract Time/Contract Price adjustment is computed. The Architect will review any such notice and request for adjustment of the Contract Time/Contract Price and render the Architect's decision in accordance with the Contract Documents.

- 3.2 Communications; Role of Construction Manager and Architect.** All communications regarding the Work, the performance thereof or the Contract Documents shall be in writing verbal communications shall be reduced to writing. Communications between the Contractor and the District or the Architect shall be through the Construction Manager. Communications between separate contractors, if any, shall be through the Construction Manager. All written communications between the Contractor and any Subcontractor, Material Supplier or others directly or indirectly engaged by the Contractor to perform or provide any portion of the Work shall be available to the District, the Construction Manager and the Architect for review, inspection and reproduction as may be requested from time to time. Failure or refusal of the Contractor to permit the District, the Construction Manager or Architect to review, inspect or reproduce such written communications may be deemed a default of Contractor hereunder.
- 3.3 Termination of Architect or Construction Manager; Substitute Architect or Construction Manager.** In case of termination of employment of the Architect or the Construction Manager, the District shall appoint a substitute architect or substitute construction manager whose status under the Contract Documents shall be that of the Architect or the Construction Manager, as applicable.

ARTICLE 4: THE CONTRACTOR

4.1 Contractor Review of Contract Documents.

- 4.1.1 Examination of Contract Documents.** The Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by the District pursuant to the Contract Documents and shall at once report to the Architect any errors, inconsistencies or omissions discovered. If the Contractor performs any Work knowing, or with reasonable diligence should have known that, it involves an error, inconsistency or omission in the Contract Documents without prior notice to the Architect of the same, the Contractor shall assume full responsibility for such performance and shall bear all attributable costs for correction of the same.
- 4.1.2 Field Measurements.** Prior to commencement of the Work, or portions thereof, the Contractor shall take field measurements and verify field conditions at the Site and shall carefully compare such field measurements and conditions and other information known to the Contractor with information provided in the Contract Documents. Errors, inconsistencies or omissions discovered shall be reported to the Architect at once.
- 4.1.3 Dimensions; Layouts and Field Engineering.** Unless otherwise expressly provided, dimensions indicated in the Drawings are intended for reference only. The Drawings are intended to be diagrammatic and schematic in nature the Contractor shall be solely responsible for coordinating the Work of the Contract Documents. All field engineering required for laying out the Work and establishing grades for earthwork operations shall be by the Contractor at its expense. Any field engineering or other engineering to be provided

or performed by the Contractor under the Contract Documents and required or necessary for the proper execution or installation of the Work shall be provided and performed by the an engineer duly registered under the laws of the State of California in the engineering discipline for such portion of the Work. Upon commencement of any item of the Work, the Contractor is responsible for dimensions of such item of Work and related Work without adjustment of the Contract Time or Contract Price, the Contractor is responsible for making component parts of the Work fit together properly.

4.1.4 Work in Accordance With Contract Documents. The Contractor shall perform all of the Work in strict conformity with the Contract Documents and approved Submittals.

4.2 Site Investigation; Subsurface Conditions.

4.2.1 Contractor Investigation. The Contractor shall be responsible for, and by executing the Agreement acknowledges, that it has carefully examined the Site and has taken all steps it deems reasonably necessary to ascertain all conditions which may effect the Work, or the cost thereof, including, without limitation, conditions bearing upon transportation, disposal, handling or storage of materials availability of labor and materials access to the Site and the physical conditions and the character of equipment, materials, labor and services necessary to perform the Work. Any failure of the Contractor to do so will not relieve it from the responsibility for fully and completely performing all Work without adjustment to the Contract Price or the Contract Time. The District assumes no responsibility to the Contractor for any understandings or representations concerning conditions or characteristics of the Site, or the Work, made by any of its officers, employees or agents prior to the execution of the Agreement, unless such understandings or representations are expressly set forth in the Agreement.

4.2.2 Subsurface Data. By executing the Agreement, the Contractor acknowledges that it has examined the boring data and other subsurface data available and satisfied itself as to the character, quality and quantity of surface and subsurface materials, including without limitation, obstacles which may be encountered in performance of the Work, insofar as this information is reasonably ascertainable from an inspection of the Site, review of available subsurface data and analysis of information furnished by the District under the Contract Documents. Subsurface data or other soils investigation report provided by the District hereunder are not a part of the Contract Documents. Information contained in such data or report regarding subsurface conditions, elevations of existing grades, or below grade elevations are approximate only and is neither guaranteed or warranted by the District to be complete and accurate. The Contractor shall examine all boring and other subsurface data to make its own independent interpretation of the subsurface conditions and acknowledges that its bid is based upon its own opinion of the conditions which may be encountered.

4.2.3 Subsurface Conditions. If the Work under the Contract Documents involves digging trenches or other excavations that extend deeper than four feet below the surface, the Contractor shall promptly and before the following conditions are disturbed, notify the Project Inspector, in writing, of any: (i) material that the Contractor believes may be material that is hazardous waste, as defined in California Health and Safety Code §25117, that is required to be removed to a Class I or Class II or Class III disposal site in accordance with provisions of existing law (ii) subsurface or latent physical conditions at the site differing from those indicated or (iii) unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent

in the Work or the character provided for in the Contract Documents. If upon notice to the District of the conditions described above and upon the District's investigation thereof, the District determines that the conditions so materially differ or involve such hazardous materials which require an adjustment to the Contract Price or the Contract Time, the District shall issue a Change Order in accordance with Article 9 hereof. In accordance with California Public Contract Code §7104, any dispute arising between the Contractor and the District as to any of the conditions listed in (i), (ii) or (iii) above, shall not excuse the Contractor from the completion of the Work within the Contract Time and the Contractor shall proceed with all Work to be performed under the Contract Documents. The District reserves the right to terminate the Contract pursuant to Article 15.2 hereof should the District determine not to proceed because of any condition described in (i), (ii) or (iii) above.

4.3 Supervision and Construction Procedures.

4.3.1 Supervision of the Work. The Contractor shall supervise and direct performance of the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract Documents, unless Contract Documents give other specific instructions concerning these matters. The Contractor shall be responsible for inspection of completed or partially completed portions of Work to determine that such portions are in proper condition to receive subsequent Work.

4.3.2 Responsibility for the Work. The Contractor shall be responsible to the District for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and all other persons performing any portion of the Work under a contract with the Contractor. The Contractor shall not be relieved of the obligation to perform the Work in accordance with the Contract Documents either by activities or duties of the Construction Manager, Project Inspector or the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons other than the Contractor.

4.3.3 Layouts. The Contractor is solely responsible for laying-out the Work so that construction of the Work conforms to the requirements of the Contract Documents and so that all component parts of the Work are coordinated. The Contractor shall be responsible for maintenance and preservation of benchmarks, reference points and stakes for the Work. The cost of maintenance and preservation of benchmarks, reference points and stakes shall be included within the Contract Price. The Contractor shall be solely responsible for all loss or costs resulting from the loss, destruction, disturbance or damage of benchmarks, reference points or stakes.

4.3.4 Construction Utilities. The District will furnish and pay the costs of utility services for the Work as set forth in the Special Conditions all other utilities necessary to complete the Work and to completely perform all of the Contractors' obligations shall be obtained by the Contractor without adjustment of the Contract Price. The Contractor shall furnish and install necessary or appropriate temporary distributions of utilities, including utilities furnished by the District. Any such temporary distributions shall be removed by the Contractor upon completion of the Work. The costs of all such utility services, including the installation and removal of temporary distributions thereof, shall be borne by the Contractor and included in the Contract Price.

4.3.5 Existing Utilities; Removal, Relocation and Protection. In accordance with California Government Code §4215, the District shall assume the responsibility for the timely removal, relocation, or protection of existing main or trunkline utility facilities located on the Site which are not identified in the Drawings, Specifications or other Contract Documents. Contractor shall be compensated for the costs of locating, repairing damage not due to the Contractor's failure to exercise reasonable care, and removing or relocating such utility facilities not indicated in the Drawings, Specifications and other Contract Documents with reasonable accuracy and for equipment on the Site necessarily idled during such work. Contractor shall not be assessed Liquidated Damages for delay in completion of the Work when such delay is caused by the failure of the District or the District of the utility to provide for removal or relocation of such utility facilities. Nothing in this Article 4.3.5 shall be deemed to require the District to indicate the presence of existing service laterals or appurtenances whenever the presence of such utilities on the Site can be inferred from the presence of other visible facilities, such as buildings, meters and junction boxes, on or adjacent to the Site. If the Contractor encounters utility facilities not identified by the District in the Drawings, Specifications, or other Contract Documents, the Contractor shall immediately notify, in writing, the District, the Project Inspector, the Architect, the Construction Manager and the utility owner. In the event that such utility facilities are owned by a public utility, the public utility shall have the sole discretion to perform repairs or relocation work or permit the Contractor to do such repairs or relocation work at a reasonable price.

4.3.6 Conferences and Meetings. A material obligation of the Contractor under the Contract Documents is the attendance at required meetings by the Contractor's supervisory personnel for the Work and the Contractor's management personnel as required by the Contract Documents or as requested by the District. The Contractor's personnel participating in conferences and meetings relating to the Work shall be authorized to act on behalf of the Contractor and to bind the Contractor. The Contractor is solely responsible for arranging for the attendance by Subcontractors, Material Suppliers at meetings and conferences relating to the Work as necessary, appropriate or as requested by the District.

4.3.6.1 Pre-Construction Conference. The Contractor's representatives (and representatives of Subcontractors as requested by the District) shall attend a Pre-Construction Conference at such time and place as designated by the District. The Pre-Construction Conference will generally address the requirements of the Work and Contract Documents, and to establish construction procedures. Subject matters of the Pre-Construction Conference will include as appropriate: (a) administrative matters, including an overview of the respective responsibilities of the District, Architect, Construction Manager, Contractor, Subcontractor, Project Inspector and others performing any part of the Work or services relating to the Work (b) Submittals (c) Changes and Change Order processing (d) employment practices, including Certified Payroll preparation and submission and prevailing wage rate responsibilities of the Contractor and Subcontractors (e) Progress Schedule development and maintenance (f) development of Schedule of Values and payment procedures (g) communication procedures, including the handling of Requests for Information (h) emergency and safety procedures (i) Site visitor policies (j) conduct of Contractor/Subcontractor personnel at the Site and (k) punchlist/close-out procedures.

4.3.6.2 Progress Meetings. Progress meetings will be conducted on regular intervals

(weekly unless otherwise expressly indicated elsewhere in the Contract Documents). The Contractor's representatives and representatives of Subcontractors (as requested by the District) shall attend Progress Meetings. Progress Meetings will be chaired by the Construction Manager and will generally include as agenda items: Site safety, field issues, coordination of Work, construction progress and impacts to timely completion, if any. The purposes of the Progress Meetings include: a formal and regular forum for discussion of the status and progress of the Work by all Project participants, a review of progress or resolution of previously raised issues and action items assigned to the Project participants, and reviews of the Progress Schedule and Submittals.

4.3.6.3 Special Meetings. As deemed necessary or appropriate by the District, Special Meetings will be conducted with the participation of the Contractor, Subcontractors and other Project participants as requested by the District.

4.3.6.4 Minutes of Meetings. Following conclusion of the Pre-Construction Conference, Progress Meetings and Special Meetings, the Construction Manager or Architect will prepare and distribute minutes reflecting the items addressed and actions taken at a meeting or conference. Unless the Contractor notifies the Architect and the Construction Manager in writing of objections or corrections to minutes prepared hereunder within five (5) dates of the date of distribution of the minutes, the minutes as distributed shall constitute the official record of the meeting or conference. No objections or corrections of any Subcontractor or Material Supplier shall be submitted directly to the Architect or the Construction Manager such objections or corrections shall be submitted to the Architect and the Construction Manager through the Contractor. If the Contractor timely interposes objections or notes corrections, the resolution of such matters shall be addressed at the next scheduled Progress Meeting.

4.3.7 Temporary Sanitary Facilities. At all times during Work at the Site, the Contractor shall obtain and maintain temporary sanitary facilities in conformity with applicable law, rule or regulation. The Contractor shall maintain temporary sanitary facilities in a neat and clean manner with sufficient toilet room supplies. Personnel engaged in the Work are not permitted to use toilet facilities at the Site.

4.3.8 Noise and Dust Control.

4.3.8.1 Noise Control. The Contractor shall install noise reducing devices on construction equipment. Contractor shall comply with the requirements of the city and county having jurisdiction with regard to noise ordinances governing construction sites and activities. Construction Equipment noise at the Site shall be limited and only as permitted by applicable law, rule or regulation. If classes are in session at any point during the progress of the Work, and, in the District's reasonable discretion, the noise from any Work disrupts or disturbs the students or faculty or the normal operation of the college, at the District's request, the Contractor shall schedule the performance of all such Work around normal college hours or make other arrangements so that the Work does not cause such disruption or disturbance. In no event shall such arrangements result in adjustment of the Contract Price or the Contract Time.

4.3.8.2 Dust Control. The Contractor shall be fully and solely responsible for

maintaining and upkeeping all areas of the Site and adjoining areas, outdoors and indoors, free from flying debris, grinding powder, sawdust, dirt and dust as well as any other product, product waste or work waste, that by becoming airborne may cause respiratory inconveniences to persons, particularly to students and District personnel. Additionally, the Contractor shall take specific care to avoid deposits of airborne dust or airborne elements. Such protection devices, systems or methods shall be in accordance with the regulations set forth by the EPA and OSHA, and other applicable law, rule or regulation. Additionally, the Contractor shall be the sole party responsible to regularly and routinely clean up and remove any and all deposits of dust and other elements. Damage and/or any liability derived from the Contractor's failure to comply with these requirements shall be exclusively at the cost of the Contractor, including, without limitation, any and all penalties that may be incurred for violations of applicable law, rule or regulation, and any amounts expended by the District to pay such damages shall be due and payable to the District on demand. Contractor shall replace any damages property or part thereof and professionally clean any and all items that become covered or partially covered to any degree by dust or other airborne elements. If classes are in session at any point during the progress of Work, and, in the District's reasonable discretion, flying debris, grinding powder, sawdust, dirt or dust from any Work disrupts or disturbs the students or faculty or the normal operation of the college, at the District's request, the Contractor shall schedule the performance of all such Work around normal college hours and make other arrangements so that the Work does not cause such disruption or disturbance. In no event shall such arrangements result in adjustment of the Contract Price or the Contract Time.

4.3.8.3 Contractor Failure to Comply. If the Contractor fails to comply with the requirements for dust control, noise control, or any other maintenance or clean up requirement of the Contract Documents, upon notice from the District, Architect, Project Inspector or Construction Manager to the Contractor, the Contractor shall take immediate action. Should the Contractor fail to respond with immediate and responsive action and not later than twenty-four (24) hours from such notification, the District shall have the absolute right to proceed as it may deem necessary to remedy such matter. Any and all costs incurred by the District in connection with such actions shall be the sole responsibility of, and be borne by, the Contractor the District may deduct such amounts from the Contract Price then or thereafter due the Contractor.

4.3.9 Debris Recycling; Contractor Submittal of Debris Recycling Statement. The Contractor and all Subcontractors shall maintain current, complete and accurate records of debris and other waste (collectively "Waste Materials") resulting from performance of the Work. The Contractor shall compile the records of the Contractor and all Subcontractors on a monthly basis. Based on such compilation, the Contractor shall, each month during performance of the Work, complete the form of Debris Recycling Statement (Attachment C to the Special Conditions) for itself and all Subcontractors performing Work at the Site. The Debris Recycling Statement must be executed by the Contractor's Superintendent, Construction Manager or other authorized employee the completed/executed form of Debris Recycling Statement shall be submitted by the Contractor to the District each month during the Work concurrently with the Contractor's submission of its Applications for Progress Payment. During the Contract term, monthly records for each calendar year shall be compiled by the Contractor's Superintendent and submitted to the College's Project Manager, no later than January 15th of the following year.

4.4 Labor and Materials.

4.4.1 Payment for Labor, Materials and Services. Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, Construction Equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated in the Work.

4.4.2 Employee Discipline. The Contractor shall enforce strict discipline and good order among the Contractor's employees, the employees of any Subcontractor or Sub-subcontractor, and all other persons performing any part of the Work at the Site. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them. The Contractor shall dismiss from its employ and direct any Subcontractor or Sub-subcontractor to dismiss from their employment any person deemed by the District to be unfit or incompetent to perform Work and thereafter, the Contractor shall not employ nor permit the employment of such person for performance of any part of the Work without the prior written consent of the District, which consent may be withheld in the reasonable discretion of the District.

4.4.3 Contractor's Superintendent. Contractor shall employ a competent Superintendent who is fluent in spoken and written English along with necessary assistants who shall be in attendance at the Site at all times during the performance of Work at the Site. Before commencing the Work, Contractor shall designate in writing the name, qualifications, experience and references from owners and architects on previous projects for Contractor's proposed Superintendent who, on approval of District, shall have full authority to represent and act for Contractor. All directions given to the Superintendent shall be as binding as if given to Contractor. A facsimile of the signatures of the authorized representatives of Contractor shall be submitted to Architect and District. The Contractor's communications relating to the Work or the Contract Documents shall be through the Contractor's Superintendent. The Superintendent shall represent the Contractor and communications given to the Superintendent shall be binding as if given to the Contractor. The Contractor shall dismiss the Superintendent or any of his/her assistants if they are deemed, in the sole reasonable judgment of the District, to be unfit, incompetent or incapable of performing the functions assigned to them. In such event, the District shall have the right to approve of the replacement superintendent or assistant. Unless expressly excused by the District, the Contractor's Superintendent shall attend all Project meetings as the Contractor's representative.

4.4.4 Prohibition on Harassment.

4.4.4.1 District's Policy Prohibiting Harassment. The District is committed to providing a campus and workplace free of sexual harassment and harassment based on factors such as race, color religion, national origin, ancestry, age, medical condition, marital status, disability or veteran status. Harassment includes without limitation, verbal, physical or visual conduct which creates an intimidating, offensive or hostile environment such as racial slurs ethnic jokes posting of offensive statements, posters or cartoons or similar conduct. Sexual harassment includes without limitation the solicitation of sexual favors, unwelcome sexual advances, or other verbal, visual or physical conduct of a sexual nature.

4.4.4.2 Contractor's Adoption of Anti-Harassment Policy. Contractor shall adopt

and implement all appropriate and necessary policies prohibiting any form of discrimination in the workplace, including without limitation harassment on the basis of any classification protected under local, state or federal law, regulation or policy. Contractor shall take all reasonable steps to prevent harassment from occurring, including without limitation affirmatively raising the subject of harassment among its employees, expressing strong disapproval of any form of harassment, developing appropriate sanctions, informing employees of their right to raise and how to raise the issue of harassment and informing complainants of the outcome of an investigation into a harassment claim. Contractor shall require that any Subcontractor or Sub-subcontractor performing any portion of the Work to adopt and implement policies in conformity with this Article 4.4.4.

4.4.4.3 Prohibition on Harassment at the Site. Contractor shall not permit any person, whether employed by Contractor, a Subcontractor, Sub-subcontractor, or any other person or entity, performing any Work at or about the Site to engage in any prohibited form of harassment. Any such person engaging in a prohibited form of harassment directed to any individual performing or providing any portion of the Work at or about the Site shall be subject to appropriate sanctions in accordance with the anti-harassment policy adopted and implemented pursuant to Article 4.4.4.2 above. Any person, performing or providing Work on or about the Site engaging in a prohibited form of harassment directed to any student, faculty member or staff of the District or directed to any other person on or about the Site shall be subject to immediate removal and shall be prohibited thereafter from providing or performing any portion of the Work. Upon the District's receipt of any notice or complaint that any person employed directly or indirectly by Contractor in performing or providing the Work has engaged in a prohibited form of harassment, the District will promptly undertake an investigation of such notice or complaint. In the event that the District, after such investigation, reasonably determines that a prohibited form of harassment has occurred, the District shall promptly notify the Contractor of the same and direct that the person engaging in such conduct be immediately removed from the Site. Unless the District's determination that a prohibited form of harassment has occurred is grossly negligent or without reasonable cause, District shall have no liability for directing the removal of any person determined to have engaged in a prohibited form of harassment nor shall the Contract Price or the Contract Time be adjusted on account thereof. Contractor and the Surety shall defend, indemnify and hold harmless the District and its employees, officers, board of trustees, agents, and representatives from any and all claims, liabilities, judgments, awards, actions or causes of actions, including without limitation, attorneys' fees, which arise out of, or pertain in any manner to: (i) the assertion by any person dismissed from performing or providing work at the direction of the District pursuant to this Article 4.4.4.3 or (ii) the assertion by any person that any person directly or indirectly under the employment or direction of the Contractor has engaged in a prohibited form of harassment directed to or affecting such person. The obligations of the Contractor and the Surety under the preceding sentence are in addition to, and not in lieu of, any other obligation of defense, indemnity and hold harmless whether arising under the Contract Documents, at law or otherwise these obligations survive completion of the Work or the termination of the Contract.

4.5 Taxes. The Contractor shall pay, without adjustment of the Contract Price, all sales, consumer, use and other taxes for the Work or portions thereof provided by the Contractor under the Contract Documents.

4.6 Permits, Fees and Notices; Compliance With Laws.

4.6.1 Payment of Permits, Fees. The District shall secure and pay for the building permits, other permits, governmental fees, licenses and inspections necessary or required for the proper execution and completion of the Work, except as otherwise provided in the Special Conditions. If permits/approvals are designated in the Special Conditions as the Contractor's responsibility, the Contractor shall obtain such permits/approvals at its sole cost and expense without adjustment of the Contract Price. Fees, costs or other expenses associated with or arising in connection with Deferred Approval Items shall be the responsibility of the Contractor without adjustment of the Contract Price.

4.6.2 Compliance With Laws. The Contractor shall comply with and give notices required by laws, ordinances, rules, regulations and other orders of public authorities bearing on performance of the Work.

4.6.3 Notice of Variation From Laws. If the Contractor knows, or has reason to believe, that any portion of the Contract Documents are at variance with applicable laws, statutes, ordinances, building codes, regulations or rules, the Contractor shall promptly notify the Architect, Construction Manager and the Project Inspector, in writing, of the same. If the Contractor performs Work knowing, or with reasonable diligence should have known, it to be contrary to laws, statutes, ordinances, building codes, rules or regulations applicable to the Work without such notice to the Architect and the Project Inspector, the Contractor shall assume full responsibility for such Work and shall bear the attributable costs arising or associated therefrom, including without limitation, the removal, replacement or correction of the same.

4.7 Submittals.

4.7.1 Purpose of Submittals. Shop Drawings, Product Data, Samples and similar submittals (collectively "Submittals") are not Contract Documents. The purpose for submission of Submittals is to demonstrate, for those portions of the Work for which Submittals are required, the manner in which the Contractor proposes to provide or incorporate such item of the Work in conformity with the information given and the design concept expressed in the Contract Documents.

4.7.2 Contractor's Submittals.

4.7.2.1 Prompt Submittals. The Contractor shall review, approve and submit to the Architect or such other person or entity designated by the District, the number of copies of Submittals required by the Contract Documents. All Submittals required by the Contract Documents shall be prepared, assembled and submitted by the Contractor to the Architect within the time frames set forth in the Submittal Schedule incorporated and made a part of the Approved Construction Schedule prepared and submitted by the Contractor pursuant to Article 7 of these General Conditions. Contractor's submission of Submittals in conformity with the Submittal Schedule is a material obligation of the Contractor. In the event of Contractor's failure or refusal to deliver Submittals to the Architect in accordance with the Submittal Schedule, the Contractor shall be subject to per diem assessments in the amount set forth in the Special Conditions for each day of delayed submission for any Submittal beyond the date set forth in the Submittal Schedule for Contractor's submission of such Submittal. Contractor and District acknowledge and agree that if Contractor shall fail to deliver

Submittals in accordance with the Submittal Schedule, the District will incur costs and expenses not contemplated by the Contract Documents, the exact amount of which are difficult to ascertain and fix. Contractor and the District acknowledge and agree that the per diem assessment for delayed submission of Submittals set forth in the Special Conditions represents a reasonable estimate of costs and expenses the District will incur as a result of delayed submission of Submittals and that the same is not a penalty. Notwithstanding Contractor's submission of all required Submittals in accordance with the Submittal Schedule, in the event that the District or the Architect reasonably determines that all or any portion of such Submittals fail to comply with the requirements of Articles 4.7.2.2, 4.7.2.3 and 4.7.2.4 of these General Conditions and/or such Submittals are not otherwise complete and accurate so as to require re-submission, Contractor shall bear all costs associated with the review and approval of the second resubmitted Submittals, including without limitation Architect's fees incurred in connection therewith provided that such costs are in addition to, and not in lieu of, any per diem assessments imposed under this Article 4.7.2.1 for Contractor's delayed submission of Submittals. In the event of the District's imposition of the per diem assessments due to the Contractor's delayed submission of Submittals or in the event of the District's assessment of costs and expenses incurred to review incomplete or inaccurate Submittals, the District may deduct the same from any portion the Contract Price then or thereafter due the Contractor. Submittals not required by the Contract Documents or which do not otherwise conform to the requirements of the Contract Documents may be returned without action. No adjustment to the Contract Time or the Contract Price shall be granted to the Contractor on account of its failure to make timely submission of any Submittal.

4.7.2.2 Approval of Subcontractor Submittals. All Submittals prepared by Subcontractors, of any tier, Material Suppliers, manufacturers or distributors shall bear the written approval of the Contractor thereto prior to submission to the Architect for review. Any Submittal not bearing the Contractor's written approval shall be subject to return to the Contractor for re-submittal in conformity herewith, with the same being deemed to not have been submitted. Any delay, impact or cost associated therewith shall be the sole and exclusive responsibility of the Contractor without adjustment to the Contract Time or the Contract Price.

4.7.2.3 Verification of Submittal Information. By approving and submission of Submittals, the Contractor represents to the District and Architect that the Contractor has determined and verified materials, field measurements, field construction criteria, catalog numbers and similar data related thereto and has checked and coordinated the information contained within such Submittals with the requirements of the Work and of the Contract Documents. Each Submittal shall include the following certification duly executed by the Contractor's Superintendent or Construction Manager for the Work:

"The Contractor has reviewed and approved the field dimensions and construction criteria of the attached Submittal. The Contractor has verified that the Submittal includes notations of any portion of the Work depicted in the Submittal which is not in strict conformity with the Contract Documents. The information in the attached Submittal has been reviewed and coordinated by the Contractor with information included in other Submittals."

4.7.2.4 Contractor Responsibility for Deviations. The Contractor shall not be

relieved of responsibility for correcting deviations from the requirements of the Contract Documents by the Architect's review of Submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submission of the Submittal and the Architect has given written approval to the specific deviation. A material obligation of the Contractor is its specific/detailed identification and notation on the transmittal cover-sheet of each submission of Submittals any deviation between the Work as indicated in the Contract Documents and as indicated in the Submittal. The Contractor shall not be relieved of responsibility for errors or omissions in Submittals by the Architect's review thereof.

4.7.2.5 No Performance of Work Without Architect Review. The Contractor shall perform no portion of the Work requiring the Architect's review of Submittals until the Architect has completed its review and returned the Submittal to the Contractor indicating "No Exception Taken" to such Submittal. The Contractor shall not perform any portion of the Work forming a part of a Submittal or which is affected by a related Submittal until the entirety of the Submittal or other related Submittal has been fully processed. Such Work shall be in accordance with the final action taken by the Architect in review of Submittals and other applicable portions of the Contract Documents.

4.7.3 Architect Review of Submittals. The purpose of the Architect's review of Submittals and the time for the Architect's return of Submittals to the Contractor shall be as set forth elsewhere in the Contract Documents. If the Architect returns a Submittal as rejected or requiring correction(s) with re-submission, the Contractor, so as not to delay the progress of the Work, shall promptly thereafter resubmit a Submittal conforming to the requirements of the Contract Documents the resubmitted Submittal shall indicate the portions thereof modified in accordance with the Architect's direction. When professional certification of performance criteria of materials, systems or equipment is required by the Contract Documents, the Architect shall be entitled to rely upon the accuracy and completeness of such calculations and certifications accompanying Submittals. The Architect's review of the Submittals is for the limited purposes described in the Contract Documents.

4.7.4 Deferred Approval Items. In the event that any portion of the Work is designated in the Contract Documents as a "Deferred Approval" item, Contractor shall be solely and exclusively responsible for the preparation of Submittals for such item(s) in a timely manner so as not to delay or hinder the completion of the Work within the Contract Time.

4.8 Materials and Equipment.

4.8.1 Specified Materials, Equipment. References in the Contract Documents to any specific article, device, equipment, product, material, fixture, patented process, form, method or type of construction, by name, make, trade name, or catalog number, with or without the words "or equal" shall be deemed to establish a minimum standard of quality or performance, and shall not be construed as limiting competition.

4.8.2 Approval of Substitutions or Alternatives. The Contractor may propose to furnish alternatives or substitutes for a particular item specified in the Contract Documents, provided that such proposed substitution or alternative complies with the requirements of the Specifications relating to substitutions of specified items and the Contractor certifies to the Architect that the quality, performance capability and functionality (including visual and/or aesthetic effect) of the proposed alternative or substitute will meet or exceed the

quality, performance capability and functionality of the item or process specified, and must demonstrate to the Architect that the use of the substitution or alternative is appropriate and will not delay completion of the Work or result in an increase to the Contract Price. The Contractor shall submit engineering, construction, dimension, visual, aesthetic and performance data to the Architect to permit its proper evaluation of the proposed substitution or alternative. If requested by the Architect, Contractor shall promptly furnish any additional information or data regarding a proposed substitution or alternative which the Architect deems reasonably necessary for the evaluation of the proposed substitution or alternative. The Contractor shall not provide, furnish or install any substitution or alternative without the Architect's review and final action on the proposed substitution or alternative any alternative or substitution installed or incorporated into the Work without first obtaining the Architect's review and final action of the same shall be subject to removal pursuant to Article 12 hereof. The Architect's decision evaluating the Contractor's proposed substitutions or alternatives shall be final. Neither the Contract Time nor the Contract Price shall be increased on account of any substitution or alternative proposed by the Contractor and which is accepted by the Architect provided, however, that in the event a substitution or alternative accepted by the Architect and purchase, fabrication and/or installation or such accepted substitution or alternative shall be less expensive than the originally specified item, the Contract Price shall be reduced by the actual cost savings realized by the Contractor's furnishing and/or installation of such approved substitution or alternative. The Contractor shall be solely responsible for all costs and fees incurred by the District to review a proposed substitution or alternative, including without limitation fees of the Architect, of the Architect's consultant(s) and/or governmental agencies to review and/or approve any proposed substitution or alternative. The Contractor shall be solely responsible for any increase in the cost of any accepted substitution or alternative or any Work affected by such alternative or substitution. The foregoing notwithstanding, all requests for the Architect's review and approval of any proposed substitution or alternative and all engineering, construction, dimension and performance data substantiating the equivalency of the proposed substitution or alternative shall be submitted by Contractor not later than thirty-five (35) days following the date of the District's award of the Contract to Contractor by action of the District's Board of Trustees any request for approval of proposed alternatives or substitutions submitted thereafter may be rejected summarily. The foregoing process and time limits shall apply to any proposed substitution or alternative regardless of whether the substitute or alternate item is to be provided, furnished or installed by Contractor, any Subcontractor, any Sub-Subcontractor, Material Supplier or Manufacturer.

4.8.3 "Sole Source" Products. If any material, equipment, product or other item is designated in the Contract Documents as a "District Standard" or similar words/terms, the District shall be deemed to have made a finding that such material, equipment, product or other item is designated and specified to match other materials, equipment, products, or other item in use in a completed or to be completed work of improvement and not subject to substitution. If any material, equipment, or other item is identified in the Contract Documents as being the only source of the material, equipment or other item necessary to accomplish the intended result(s), such material, equipment or other item shall not be subject to substitution.

4.8.4 Placement of Material and Equipment Orders. Contractor shall, after award of the Contract, promptly and timely place all orders for materials and/or equipment necessary for completion of the Work so that delivery of the same shall be made without delay or interruption to the timely completion of the Work. Contractor shall require that any

Subcontractor or Sub-Subcontractor performing any portion of the Work similarly place orders for all materials and/or equipment to be furnished by any such Subcontractor or Sub-Subcontractor in a prompt and timely manner so that delivery of the same shall be made without delay or interruption to the timely completion of the Work. Upon request of the District, Construction Manager or the Architect, the Contractor shall furnish reasonably satisfactory written evidence of the placement of orders for materials and/or equipment necessary for completion of the Work, including without limitation, orders for materials and/or equipment to be provided, furnished or installed by any Subcontractor or Sub-Subcontractor.

4.8.5 District's Right to Place Orders for Materials and/or Equipment. Notwithstanding any other provision of the Contract Documents, in the event that the Contractor shall, upon request of the District or the Architect, fail or refuse, for any reason, to provide reasonably satisfactory written evidence of the placement of orders for materials and/or equipment necessary for completion of the Work, or should the District determine, in its sole and reasonable discretion, that any orders for materials and/or equipment have not been placed in a manner so that such materials and/or equipment will be delivered to the Site so the Work can be completed without delay or interruption, the District shall have the right, but not the obligation, to place such orders on behalf of the Contractor. If the District exercises the right to place orders for materials and/or equipment pursuant to the foregoing, the District's conduct shall not be deemed to be an exercise, by the District, of any control over the means, methods, techniques, sequences or procedures for completion of the Work, all of which remain the responsibility and obligation of the Contractor. Notwithstanding the right of the District to place orders for materials and/or equipment pursuant to the foregoing, the election of the District to exercise, or not to exercise, such right shall not relieve the Contractor from any of Contractor's obligations under the Contract Documents, including without limitation, completion of the Work within the Contract Time and for the Contract Price. If the District exercises the right hereunder to place orders for materials and/or equipment on behalf of Contractor pursuant to the foregoing, Contractor shall reimburse the District for all costs and fees incurred by the District in placing such orders such costs and fees may be deducted by the District from the Contract Price then or thereafter due the Contractor.

4.9 Safety.

4.9.1 Safety Programs. The Contractor shall be solely responsible for initiating, maintaining and supervising all safety programs required by applicable law, ordinance, regulation or governmental orders in connection with the performance of the Contract, or otherwise required by the type or nature of the Work. The Contractor's safety program shall include all actions and programs necessary for compliance with California or federally statutorily mandated workplace safety programs, including without limitation, compliance with the California Drug Free Workplace Act of 1990 (California Government Code §8350 et seq.). Without limiting or relieving the Contractor of its obligations hereunder, the Contractor shall require that its Subcontractors similarly initiate and maintain all appropriate or required safety programs. Prior to commencement of Work at the Site, the Contractor shall provide the Architect, Project Inspector, the Construction Manager and District with the Contractor's proposed safety program for the Work for the Construction Manager's review. The Architect, the Construction Manager and the Project Inspector are authorized to enforce the Contractor's obligation to implement the safety program accepted by the Construction Manager.

4.9.2 Safety Precautions. The Contractor shall be solely responsible for initiating and maintaining reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to: (i) employees on the Work and other persons who may be affected thereby (ii) the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors and (iii) other property or items at the site of the Work, or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction. The Contractor shall take adequate precautions and measures to protect existing roads, sidewalks, curbs, pavement, utilities, adjoining property and improvements thereon (including without limitation, protection from settlement or loss of lateral support) and to avoid damage thereto. Without adjustment of the Contract Price or the Contract Time, the Contractor shall repair, replace or restore any damage or destruction of the foregoing items as a result of performance or installation of the Work. Contractor's personnel who do not abide by Contractor's accepted Safety Plan shall be removed from the site.

4.9.3 Safety Signs, Barricades. The Contractor shall erect and maintain, as required by existing conditions and conditions resulting from performance of the Contract, reasonable safeguards for safety and protection of property and persons, including, without limitation, posting danger signs and other warnings against hazards, promulgating safety regulations and notifying Districts and users of adjacent sites and utilities. Contractor shall provide directional and informational signage as required to direct pedestrian traffic around the work area. Contractor will be required to fence in the Construction Site and all gates shall be closed while students are on campus. Contractor shall provide spotters, both front and rear, for any vehicles moving throughout occupied student or faculty areas.

4.9.4 Safety Notices. The Contractor shall give or post all notices required by applicable law and comply with applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

4.9.5 Safety Coordinator. The Contractor shall designate a responsible member of the Contractor's organization at the Site whose duty shall be the prevention of accidents and the implementation and maintenance safety precautions and programs. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Project Inspector and the Architect.

4.9.6 Emergencies; First Aid. In an emergency affecting safety of persons or property, the Contractor shall act, to prevent threatened damage, injury or loss. The Contractor shall maintain stocked emergency first aid kits at the Site which comply with applicable law, rule or regulation.

4.9.7 Hazardous Materials.

4.9.7.1 General. In the event that the Contractor, any Subcontractor or anyone employed directly or indirectly by them shall use, at the Site, or incorporate into the Work, any material or substance deemed to be hazardous or toxic under any law, rule, ordinance, regulation or interpretation thereof (collectively "Hazardous Materials"), the Contractor shall comply with all laws, rules, ordinances or regulations applicable thereto and shall exercise all necessary safety precautions relating to the

use, storage or disposal thereof.

4.9.7.2 Prohibition on Use of Asbestos Construction Building Materials (“ACBMs”). Notwithstanding any provision of the Drawings or the Specifications to the contrary, it is the intent of the District that ACBMs not be used or incorporated into any portion of the Work. In the event that any portion of the Work depicted in the Drawings or the Specifications shall require materials or products which the Contractor knows, or should have known with reasonably diligent investigation, to contain ACBMs, Contractor shall promptly notify the Architect and the Project Inspector of the same so that an appropriate alternative can be made in a timely manner so as not to delay the progress of the Work. Contractor warrants to the District that there are no materials or products used or incorporated into the Work which contain ACBMs. Whether before or after completion of the Work, if it is discovered that any product or material forming a part of the Work or incorporated into the Work contains ACBMs, the Contractor shall at its sole cost and expense remove such product or material in accordance with any laws, rules, procedures and regulations applicable to the handling, removal and disposal of ACBMs and to replace such product or material with non-ACBM products or materials and to return the affected portion(s) of the Work to the finish condition depicted in the Drawings and Specifications relating to such portion(s) of the Work. Contractor's obligations under the preceding sentence shall survive the termination of the Contract, the warranty period provided under the Contract Documents, the Contractor's completion of the Work or the District's acceptance of the Work. In the event that the Contractor shall fail or refuse, for any reason, to commence the removal and replacement of any material or product containing ACBMs forming a part of, or incorporated into the Work, within ten (10) days of the date of the District's written notice to the Contractor of the existence of ACBM materials or products in the Work, the District may thereafter proceed to cause the removal and replacement of such materials or products in any manner which the District determines to be reasonably necessary and appropriate all costs, expenses and fees, including without limitation fees and costs of consultants and attorneys, incurred by the District in connection with such removal and replacement shall be the responsibility of the Contractor and the Contractor's Performance Bond Surety.

4.9.7.3 Disposal of Hazardous Materials. Contractor shall be solely and exclusively responsible for the disposal of any Hazardous Materials on or about Site resulting from the Contractor's performance of Work and other activities. The Contractor's obligations hereunder shall include without limitation, the transportation and disposal of any Hazardous Materials in strict conformity with any and all applicable laws, regulations, orders, procedures or ordinances.

4.10 Maintenance of Documents.

4.10.1 Documents at Site. The Contractor shall maintain at the Site: (i) one record copy of the Drawings, Specifications and all addenda thereto (ii) Change Orders approved by the District and all other modifications to the Contract Documents (iii) Submittals reviewed by the Architect; (iv) Record Drawings; (v) Material Safety Data Sheets (“MSDS”) accompanying any materials, equipment or products delivered or stored at the Site or incorporated into the Work and (vi) all building and other codes or regulations applicable to the Work, including without limitation, Title 24, Part 2 of the California Code of Regulations. During performance of the Work, all documents maintained by Contractor at

the Site shall be available to the District, the Construction Manager, the Architect, the Project Inspector and DSA for review, inspection or reproduction. Upon completion of the Work, all documents maintained at the Site by the Contractor pursuant to the foregoing shall be assembled and transmitted to the Architect for delivery to the District.

4.10.2 Maintenance of Record Drawings. During its performance of the Work, the Contractor shall maintain Record Drawings consisting of a set of the Drawings which are marked to indicate all field changes made to adapt the Work depicted in the Drawings to field conditions, changes resulting from Change Orders and all concealed or buried installations, including without limitation, piping, conduit and utility services. All buried or concealed items of Work shall be completely and accurately marked and located on the Record Drawings. The Record Drawings shall be clean and all changes, corrections and dimensions shall be marked in a neat and legible manner in a contrasting color. Record Drawings relating to the Structural, Mechanical, Electrical and Plumbing portions of the Work shall indicate without limitation, circuiting, wiring sizes, equipment/member sizing and shall depict the entirety of the as built conditions of such portions of the Work. The Record Drawings shall be continuously maintained by the Contractor during the performance of the Work. At any time during the Contractor's performance of the Work, upon the request of the District, the Project Inspector or the Architect, the Contractor shall make the Record Drawings maintained here under available for the District's review and inspection. The District's review and inspection of the Record Drawings during the Contractor's performance of the Work shall be only for the purpose of generally verifying that Contractor is continuously maintaining the Record Drawings in a complete and accurate manner any such inspection or review shall not be deemed to be the District's approval or verification of the completeness or accuracy thereof. The failure or refusal of the Contractor to continuously maintain complete and accurate Record Drawings or to make available the Record Drawings for inspection and review by the District may be deemed by the District to be Contractor's default of a material obligation hereunder. Without waiving, restricting or limiting any other right or remedy of the District for the Contractor's failure or refusal to continuously maintain the Record Drawings, the District may, upon reasonably determining that the Contractor has not, or is not, continuously maintaining the Record Drawings in a complete and accurate manner, take appropriate action to cause the continuous maintenance of complete and accurate Record Drawings, in which event all fees and costs incurred or associated with such action shall be charged to the Contractor and the District may deduct the amount of such fees and costs from any portion of the Contract Price then or thereafter due the Contractor. In accordance with Article 8.4.2 of these General Conditions, prior to receipt of the Final Payment, Contractor shall deliver the Record Drawings to the Construction Manager for transmittal of the District.

4.11 Use of Site. The Contractor shall confine operations at the Site to areas permitted by law, ordinances or permits, subject to any restrictions or limitations set forth in the Contract Documents. The Contractor's construction site and lay down area shall be limited to the agreed upon construction site. The entire construction site shall be fenced in with temporary construction fencing until project or current phase of project is substantially complete. The fencing will be privacy screened. The Contractor shall not unreasonably encumber the Site or adjoining areas with materials or equipment. The Contractor shall be solely responsible for providing security at the Site with all such costs included in the Contract Price. The District shall at all times have access to the Site.

4.12 Clean-Up. The Contractor shall at all times keep the Site and all adjoining areas free from

the accumulation of any waste material or rubbish caused or generated by performance of the Work. Without limiting the generality of the foregoing, Contractor shall maintain the Site in a "broom-clean" standard on a daily basis. In the event that the Work of the Contract Documents includes painting and/or the installation of floor covering, prior to commencement of any painting operations or the installation of any flooring covering, the area and adjoining areas of the Site where paint is to be applied or floor covering is to be installed shall be in a "broom-clean" condition. Prior to completion of the Work, Contractor shall remove from the Site all rubbish, waste material, excess excavated material, tools, Construction Equipment, machinery, surplus material and any other items which are not the property of the District under the Contract Documents. At completion of the Work, the Contractor shall clean the building interior and exterior, including fixtures, equipment, walls, floors, ceilings, roofs, window sills and ledges, horizontal surfaces, areas where debris, dust and similar items have collected, clean and polish all glass, plumbing fixtures, finish hardware, metal/wood/stone finishes. As directed by the Construction Manager, District or Architect, the Contractor shall remove temporary fencing, barricades, planking, temporary sanitary facilities, temporary utility distributions and other temporary facilities. Upon completion of the Work, the Site and all adjoining areas shall be left in a neat and broom clean condition satisfactory to District. The Project Inspector or Construction Manager shall be authorized to direct the Contractor's clean-up obligations hereunder. If the Contractor fails to clean up as provided for in the Contract Documents, the District may do so, and all costs incurred in connection therewith shall be charged to the Contractor the District may deduct such costs from any portion of the Contract Price then or thereafter due the Contractor.

- 4.13 Access to the Work.** The Contractor shall provide the DSA, the District, the Construction Manager, the Project Inspector, the Architect and the Architect's consultant(s) with access to the Work, whether in place, preparation and progress and wherever located.
- 4.14 Information and Facilities/Services for the Project Inspector.** The Contractor shall furnish the Project Inspector access to the Work for obtaining such information as may be necessary to keep the Project Inspector fully informed respecting the progress, quality and character of the Work and materials, equipment or other items incorporated therein. The Contractor shall provide, without adjustment of the Contract Price, for use by the Project Inspector, the District and Construction Manager the facilities, equipment, furnishings and services set forth in the Special Conditions. If the Contractor does not provide the facilities, furnishings, equipment and services set forth in the Special Conditions, or fails to pay timely any charges or fees arising out of the use of the same, the District may, as applicable, procure facilities, furnishings, equipment and services required by the Contract Documents or pay outstanding charges. Contractor shall reimburse the District for all costs, including the District's administrative costs, incurred by the District pursuant to the preceding sentence in lieu of the Contractor's reimbursement and at the sole and exclusive discretion of the District, such costs may be deducted by the District from any portion of the Contract Price or thereafter due the Contractor.
- 4.15 Patents and Royalties.** The Contractor and the Surety shall defend, indemnify and hold harmless the District and its agents, employees and officers from any claim, demand or legal proceeding arising out of or pertaining, in any manner, to any actual or claimed infringement of patent rights in connection with performance of the Work under the Contract Documents.
- 4.16 Cutting and Patching.** The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make the component parts thereof fit together properly. The Contractor shall not damage or endanger any portion of the Work, or the fully or partially

completed construction of the District or separate contractors by cutting, patching, excavation or other alteration. When modifying new Work or when installing Work adjacent to an existing structure/facility, the Contractor shall match, as closely as conditions of the Site and materials will allow the finishes, textures and colors of the existing structure/facility and refinish elements of the existing structure/facility. The Contractor shall not cut, patch or otherwise alter the construction by the District or separate contractor without the prior written consent of the District or separate contractor thereto, which consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold consent to the request of the District or separate contractor to cut, patch or otherwise alter the Work.

4.17 Encountering of Hazardous Materials. In the event the Contractor encounters Hazardous Materials at the Site which have not been rendered harmless or for which there is no provision in the Contract Documents for containment, removal, abatement or handling of such Hazardous Materials, the Contractor shall immediately stop the Work in the affected area, but shall diligently proceed with the Work in all other unaffected areas. Upon encountering such Hazardous Materials, the Contractor shall immediately notify the Project Inspector and the Architect, in writing, of such condition. The Contractor shall proceed with the Work in such affected area only after such Hazardous Materials have been rendered harmless, contained, removed or abated. In the event such Hazardous Materials are encountered, the Contractor shall be entitled to an adjustment of the Contract Time to the extent that the Work is stopped and Substantial Completion of the Work is affected thereby. In no event shall there be an adjustment to the Contract Price solely on account of the Contractor encountering such Hazardous Materials.

4.18 Wage Rates; Employment of Labor.

4.18.1 Determination of Prevailing Rates. Pursuant to the provisions of Division 2, Part 7, Chapter 1, Article 2 of the California Labor Code at §1770 et seq., the District has obtained from the Director of the Department of Industrial Relations the general prevailing rate of per diem wages and the prevailing rate for holiday and overtime work in the locality in which the Work is to be performed. Holidays shall be as defined in the collective bargaining agreement applicable to each particular craft, classification or type of worker employed under the Contract. Per diem wages include employer payments for health and welfare, pensions, vacation, travel time and subsistence pay as provided in California Labor Code §1773.8, apprenticeship or other training programs authorized by California Labor Code §3093, and similar purposes when the term “per diem wages” is used herein. Holiday and overtime work, when permitted by law, shall be paid for at the rate of at least one and one-half (1½) times the above specified rate of per diem wages, unless otherwise specified. The Contractor shall post, at appropriate and conspicuous locations on the Site, a schedule showing all determined general prevailing wage rates.

4.18.2 Payment of Prevailing Rates. There shall be paid each worker of the Contractor, or any Subcontractor, of any tier, engaged in the Work, not less than the general prevailing wage rate, regardless of any contractual relationship which may be alleged to exist between the Contractor or any Subcontractor, of any tier, and such worker.

4.18.3 Prevailing Rate Penalty. The Contractor shall, as a penalty, forfeit not more than Fifty Dollars (\$50.00) to the District for each calendar day or portion thereof, for each worker paid less than the prevailing rates for such work or craft in which such worker is employed for the Work by the Contractor or by any Subcontractor, of any tier, in connection with the Work. The amount of the penalty for failure to pay applicable prevailing wage rates shall

be determined and assessed in accordance with the standards established pursuant to Labor Code §1775(a)(2). The amount of the penalty shall be determined based on consideration of both of the following: (i) whether the failure of the Contractor or Subcontractor to pay the correct rate of per diem wages was a good faith mistake and, if so, the error was promptly and voluntarily corrected when brought to the attention of the Contractor or Subcontractor and (ii) whether the Contractor or Subcontractor has a prior record of failing to meet its prevailing wage obligations. The penalty may not be less than ten dollars (10) for each calendar day, or portion thereof, for each worker paid less than the prevailing wage rate, unless the failure of the Contractor or Subcontractor to pay the correct rate of per diem wages was a good faith mistake and, if so, the error was promptly and voluntarily corrected when brought to the attention of the contractor or subcontractor. The penalty may not be less than twenty dollars (20) for each calendar day, or portion thereof, for each worker paid less than the prevailing wage rate, if the Contractor or Subcontractor has been assessed penalties within the previous three years for failing to meet its prevailing wage obligations on a separate contract, unless those penalties were subsequently withdrawn or overturned. The penalty may not be less than thirty dollars (30) for each calendar day, or portion thereof, for each worker paid less than the prevailing wage rate, if the Labor Commissioner determines that the violation was willful, as defined in subdivision (c) of Section 1777.1. When the penalty amount due hereunder is collected from the Contractor or Subcontractor, any outstanding wage claim under Chapter 1 (commencing with Section 1720) of Part 7 of Division 2 against that Contractor or Subcontractor shall be satisfied before applying that amount to the penalty imposed on that Contractor or Subcontractor hereunder. The difference between prevailing wage rates and the amount paid to each worker each calendar day, or portion thereof, for which each worker paid less than the prevailing wage rate, shall be paid to each worker by the Contractor.

4.18.4 Payroll Records. Pursuant to California Labor Code §1776, the Contractor and each Subcontractor, of any tier, shall keep an accurate payroll record, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each person employed for the Work. The payroll records shall be certified and available for inspection at all reasonable hours at the principal office of the Contractor on the following basis: (i) a certified copy of an employee's payroll record shall be made available for inspection or furnished to such employee or his/her authorized representative on request (ii) a certified copy of all payroll records shall be made available for inspection or furnished upon request to the District, the Division of Labor Standards Enforcement and the Division of Apprenticeship Standards of the Department of Industrial Relations (iii) a certified copy of payroll records shall be made available upon request to the public for inspection or copies thereof made provided, however, that a request by the public shall be made through either the District, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested payroll records have not been provided, the requesting party shall, prior to being provided the records, reimburse the cost of preparation by the Contractor, Subcontractors and the entity through which the request was made the public shall not be given access to such records at the principal office of the Contractor (iv) the Contractor shall file a certified copy of the payroll records with the entity that requested such records within ten (10) days after receipt of a written request (v) any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the District, the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address and social security number. The name

and address of the Contractor or any Subcontractor, of any tier, performing a part of the Work shall not be marked or obliterated. The Contractor shall inform the District of the location of payroll records, including the street address, city and county and shall, within five (5) working days, provide a notice of a change or location and address. In the event of noncompliance with the requirements of this Article 4.18.4, the Contractor shall have ten (10) days in which to comply, subsequent to receipt of written notice specifying in what respects the Contractor must comply herewith. Should noncompliance still be evident after such 10-day period, the Contractor shall, as a penalty to the District, forfeit Twenty-Five Dollars (25.00) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, such penalties shall be withheld from any portion of the Contract Price then or thereafter due the Contractor. The Contractor is solely responsible for compliance with the foregoing provisions.

4.18.5 Hours of Work.

4.18.5.1 Limits on Hours of Work. Pursuant to California Labor Code §1810, eight (8) hours of labor shall constitute a legal day's work. Pursuant to California Labor Code §1811, the time of service of any worker employed at any time by the Contractor or by a Subcontractor, of any tier, upon the Work or upon any part of the Work, is limited and restricted to eight (8) hours during any one calendar day and forty (40) hours during any one calendar week, except as hereafter provided. Notwithstanding the foregoing provisions, Work performed by employees of Contractor or any Subcontractor, of any tier, in excess of eight (8) hours per day and forty (40) hours during any one week, shall be permitted upon compensation for all hours worked in excess of eight (8) hours per day at not less than one and one-half (1½) times the basic rate of pay.

4.18.5.2 Penalty for Excess Hours. The Contractor shall pay to the District a penalty of Twenty-five Dollars (25.00) for each worker employed on the Work by the Contractor or any Subcontractor, of any tier, for each calendar day during which such worker is required or permitted to work more than eight (8) hours in any calendar day and forty (40) hours in any one calendar week, in violation of the provisions of the California Labor Code, unless compensation to the worker so employed by the Contractor is not less than one and one-half (1½) times the basic rate of pay for all hours worked in excess of eight (8) hours per day.

4.18.5.3 Contractor Responsibility. Any Work performed by workers necessary to be performed after regular working hours or on Sundays or other holidays shall be performed without adjustment to the Contract Price or any other additional expense to the District. The Contractor shall be responsible for costs incurred by the District which arise out of Work performed by the Contractor at times other than regular working hours and regular working days. Upon determination of such costs, the District may deduct such costs from the Contract Price then or thereafter due the Contractor.

4.18.6 Apprentices.

4.18.6.1 Employment of Apprentices. Any apprentices employed to perform any of the Work shall be paid the standard wage paid to apprentices under the regulations of the craft or trade for which such apprentice is employed, and such individual shall

be employed only for the work of the craft or trade to which such individual is registered. Only apprentices, as defined in California Labor Code §3077 who are in training under apprenticeship standards and written apprenticeship agreements under California Labor Code §§3070 et seq. are eligible to be employed for the Work. The employment and training of each apprentice shall be in accordance with the provisions of the apprenticeship standards and apprentice agreements under which such apprentice is training.

4.18.6.2 Apprenticeship Certificate. When the Contractor or any Subcontractor, of any tier, in performing any of the Work employs workers in any Apprenticeable Craft or Trade, the Contractor and such Subcontractor shall apply to the Joint Apprenticeship Committee administering the apprenticeship standards of the craft or trade in the area of the site of the Work for a certificate approving the Contractor or such Subcontractor under the apprenticeship standards for the employment and training of apprentices in the area or industry affected, provided, however, that the approval as established by the Joint Apprenticeship Committee or Committees shall be subject to the approval of the Administrator of Apprenticeship. The Joint Apprenticeship Committee or Committees, subsequent to approving the Contractor or Subcontractor, shall arrange for the dispatch of apprentices to the Contractor or such Subcontractor in order to comply with California Labor Code §1777.5. The Contractor and Subcontractors shall submit contract award information to the applicable Joint Apprenticeship Committee which shall include an estimate of journeyman hours to be performed under the Contract, the number of apprentices to be employed, and the approximate dates the apprentices will be employed. There shall be an affirmative duty upon the Joint Apprenticeship Committee or Committees, administering the apprenticeship standards of the crafts or trades in the area of the site of the Work, to ensure equal employment and affirmative action and apprenticeship for women and minorities. Contractors or Subcontractors shall not be required to submit individual applications for approval to local Joint Apprenticeship Committees provided they are already covered by the local apprenticeship standards.

4.18.6.3 Ratio of Apprentices to Journeymen. The ratio of Work performed by apprentices to journeymen, who shall be employed in the Work, may be the ratio stipulated in the apprenticeship standards under which the Joint Apprenticeship Committee operates, but in no case shall the ratio be less than one hour of apprentice work for each five hours of labor performed by a journeyman, except as otherwise provided in California Labor Code §1777.5. The minimum ratio for the land surveyor classification shall not be less than one apprentice for each five journeymen. Any ratio shall apply during any day or portion of a day when any journeyman, or the higher standard stipulated by the Joint Apprenticeship Committee, is employed at the site of the Work and shall be computed on the basis of the hours worked during the day by journeymen so employed, except for the land surveyor classification. The Contractor shall employ apprentices for the number of hours computed as above before the completion of the Work. The Contractor shall, however, endeavor, to the greatest extent possible, to employ apprentices during the same time period that the journeymen in the same craft or trade are employed at the site of the Work. Where an hourly apprenticeship ratio is not feasible for a particular craft or trade, the Division of Apprenticeship Standards, upon application of a Joint Apprenticeship Committee, may order a minimum ratio of not less than one apprentice for each five journeymen in a craft or trade classification. The Contractor or any Subcontractor covered by this Article and California Labor Code §1777.5, upon the issuance of the approval

certificate, or if it has been previously approved in such craft or trade, shall employ the number of apprentices or the ratio of apprentices to journeymen stipulated in the apprenticeship standards. Upon proper showing by the Contractor that it employs apprentices in such craft or trade in the State of California on all of its contracts on an annual average of not less than one apprentice to each five journeymen, the Division of Apprenticeship Standards may grant a certificate exempting the Contractor from the 1-to-5 ratio as set forth in this Article and California Labor Code §1777.5. This Article shall not apply to contracts of general contractors, or to contracts of specialty contractors not bidding for work through a general or prime contractor, involving less than Thirty Thousand Dollars (\$30,000.00) or twenty (20) working days. The term "Apprenticeable Craft or Trade," as used herein shall mean a craft or trade determined as an Apprenticeable occupation in accordance with rules and regulations prescribed by the Apprenticeship Council.

4.18.6.4 Exemption From Ratios. The Joint Apprenticeship Committee shall have the discretion to grant a certificate, which shall be subject to the approval of the Administrator of Apprenticeship, exempting the Contractor from the 1-to-5 ratio set forth in this Article when it finds that any one of the following conditions are met: (i) unemployment for the previous three-month period in such area exceeds an average of fifteen percent (15 %) or (ii) the number of apprentices in training in such area exceeds a ratio of 1-to-5 in relation to journeymen, or (iii) the Apprenticeable Craft or Trade is replacing at least one-thirtieth (1/30) of its journeymen annually through apprenticeship training, either on a statewide basis or on a local basis, or (iv) if assignment of an apprentice to any Work performed under the Contract Documents would create a condition which would jeopardize such apprentice's life or the life, safety or property of fellow employees or the public at large, or if the specific task to which the apprentice is to be assigned is of such a nature that training cannot be provided by a journeyman. When such exemptions from the 1-to-5 ratio between apprentices and journeymen are granted to an organization which represents contractors in a specific trade on a local or statewide basis, the member contractors will not be required to submit individual applications for approval to local Joint Apprenticeship Committees, provided they are already covered by the local apprenticeship standards.

4.18.6.5 Contributions to Trust Funds. The Contractor or any Subcontractor, of any tier, who, performs any of the Work by employment of journeymen or apprentices in any Apprenticeable Craft or Trade and who is not contributing to a fund or funds to administer and conduct the apprenticeship program in any such craft or trade in the area of the site of the Work, to which fund or funds other contractors in the area of the site of the Work are contributing, shall contribute to the fund or funds in each craft or trade in which it employs journeymen or apprentices in the same amount or upon the same basis and in the same manner as the other contractors do, but where the trust fund administrators are unable to accept such funds, contractors not signatory to the trust agreement shall pay a like amount to the California Apprenticeship Council. The Division of Labor Standards Enforcement is authorized to enforce the payment of such contributions to such fund(s) as set forth in California Labor Code §227. Such contributions shall not result in an increase in the Contract Price.

4.18.6.6 Contractor's Compliance. The responsibility of compliance with this Article for all Apprenticeable Trades or Crafts is solely and exclusively that of the Contractor. All decisions of the Joint Apprenticeship Committee(s) under this Article are subject

to the provisions of California Labor Code §3081. In the event the Contractor willfully fails to comply with the provisions of this Article and California Labor Code §1777.5, pursuant to California Labor Code §1777.7, the Contractor shall: (i) be denied the right to bid on any public works contract for a period of one (1) year from the date the determination of non-compliance is made by the Administrator of Apprenticeship and (ii) forfeit, as a civil penalty, Fifty Dollars (50.00) for each calendar day of noncompliance. Notwithstanding the provisions of California Labor Code §1727, upon receipt of such determination, the District shall withhold such amount from the Contract Price then due or to become due. Any such determination shall be issued after a full investigation, a fair and impartial hearing, and reasonable notice thereof in accordance with reasonable rules and procedures prescribed by the California Apprenticeship Council. Any funds withheld by the District pursuant to this Article shall be deposited in the General Fund or other similar fund of the District. The interpretation and enforcement of California Labor Code §§1777.5 and 1777.7 shall be in accordance with the rules and procedures of the California Apprenticeship Council.

4.18.7 Employment of Independent Contractors. Pursuant to California Labor Code §1021.5, Contractor shall not willingly and knowingly enter into any agreement with any person, as an independent contractor, to provide any services in connection with the Work where the services provided or to be provided requires that such person hold a valid contractors license issued pursuant to California Business and Professions Code §§7000 et seq. and such person does not meet the burden of proof of his/her independent contractor status pursuant to California Labor Code §2750.5. In the event that Contractor shall employ any person in violation of the foregoing, Contractor shall be subject to the civil penalties under California Labor Code §1021.5 and any other penalty provided by law. In addition to the penalties provided under California Labor Code §1021.5, Contractor's violation of this Article 4.18.7 or the provisions of California Labor Code §1021.5 shall be deemed an event of Contractor's default under Article 15.1 of these General Conditions. The Contractor shall require any Subcontractor or Sub-Subcontractor performing or providing any portion of the Work to adhere to and comply with the foregoing provisions.

4.19 Assignment of Antitrust Claims. Pursuant to California Government Code §4551, the Contractor and its Subcontractor(s), of any tier, hereby offers and agrees to assign to the District all rights, title and interest in and to all causes of action they may have under Section 4 of the Clayton Act, (15 U.S.C. §15) or under the Cartwright Act (California Business and Professions Code §§16700 et seq.), arising from purchases of goods, services or materials hereunder or any Subcontract. This assignment shall be made and become effective at the time the District tenders Final Payment to the Contractor, without further acknowledgment by the parties. If the District receives, either through judgment or settlement, a monetary recovery in connection with a cause of action assigned under California Government Code §§4550 et seq., the assignor thereof shall be entitled to receive reimbursement for actual legal costs incurred and may, upon demand, recover from the District any portion of the recovery, including treble damages, attributable to overcharges that were paid by the assignor but were not paid by the District as part of the Contract Price, less the expenses incurred by the District in obtaining that portion of the recovery. Upon demand in writing by the assignor, the District shall, within one year from such demand, reassign the cause of action assigned pursuant to this Article if the assignor has been or may have been injured by the violation of law for which the cause of action arose: and (i) the District has not been injured thereby or (ii) the District declines to file a court action for the cause of action.

4.20 Limitations Upon Site Activities. Except in the circumstances of an emergency, no construction activities shall be permitted at or about the Site except during the District's hours and days set forth in the Special Conditions. Work performed outside of the hours and days noted in the Special Conditions will not result in adjustment of the Contract Time or the Contract Price unless Work outside of the hours and days noted in the Special Conditions is expressly authorized by the District.

4.21 Labor Compliance Program ("LCP"). Pursuant to Labor Code §1771.7, the District has established a Labor Compliance Program. Unless otherwise expressly provided in the Contract Documents, the LCP is applicable to the entirety of the Work. A material obligation of the Contractor awarded the Contract is its strict compliance with all applicable provisions and requirements of the LCP and its strict enforcement of such provisions and requirements on its Subcontractors and others under the direction or control of the Contractor relating to the Work or the Project. A copy of the LCP is available for review and reproduction in the District's administrative office.

4.21.1 Pre-Construction Conference. In addition to the matters included in the scope of the Pre-Conference, as set forth in Article 4.3.6.1 of the General Conditions, the Pre-Construction conference will include a discussion of the subject matters indicated in the Pre-Construction Conference portion of the LCP, including general requirements of the LCP, measures for compliance with, and enforcement of, LCP requirements, and penalties for failure to comply. The Contractor awarded the Contract and each Subcontractor identified by such Contractor in its Subcontractors List submitted with its Bid Proposal. The foregoing notwithstanding, if the District reasonably determines that individuals or entities in addition to the Contractor and its listed Subcontractor are necessary attendees at the Pre-Construction conference, the Contractor is responsible for measures necessary to secure the attendance of such other persons or entities at the Pre-Construction conference.

4.21.2 Maintenance and Weekly Submission of Certified Payroll Records. The Contractor and each of its Subcontractors shall maintain accurate, complete and current payroll records as required by the LCP. During the progress of the Work, until Final Payment is due, the Contractor and its Subcontractors shall maintain and submit Certified Payroll Records on a weekly basis. No later than the 5:00 P.M. on each Monday during the Work, the Contractor shall submit to the Construction Manager Certified Payroll Records for the Contractor and its Subcontractors for all persons providing or performing any Work in the immediately preceding week. The Certified Payroll Records maintained and submitted hereunder shall be in strict conformity with requirements established in the LCP. A material obligation of the Contractor under the Contract Documents is the Contractor's and its Subcontractor's strict compliance with requirements of the LCP relating to maintenance and submission of Certified Payroll Records. The Contractor's submittal of weekly Certified Payroll Records in strict conformity with requirements of the LCP is an express condition precedent to the District's obligation to disburse any Progress Payment to the Contractor and the Contractor's entitlement to receipt of any Progress Payment.

4.21.3 District Audit of Certified Payroll Records. Pursuant to the LCP, the District shall, as appropriate or necessary conduct audits of Certified Payroll Records. If upon conducting such audits, the District determines that the Contractor or its Subcontractors have committed violations of the LCP, the Contractor and/or its Subcontractors shall be subject to all penalties, assessments and other remedies set forth in the LCP or by

operation of law for such violations.

4.21.4 Contractor's Rights Upon Determination of Violation. If upon audit of Certified Payroll Records, the District determines that the Contractor has violated, or failed to comply with, applicable provisions of the LCP, the Contractor shall be subject to the penalties, assessments and other remedies set forth in the LCP for the Contractor's violation of, or failure to comply with, the LCP. To the extent applicable, the Contractor shall be entitled to contest or appeal such determination, as set forth in the LCP, provided that the Contractor strictly complies with all applicable provisions of applicable law and the LCP relating to the initiation and completion of proceeding to contest or appeal a determination that the Contractor has committed a violation of, or failed to comply with, the LCP.

4.21.5 LCP Not Exclusive. The LCP is not the exclusive source of Contractor's obligations relating to the payment of prevailing wages and compliance with apprenticeship standards. A material obligation of the Contractor under the Contract Documents is the Contractor's compliance with all applicable laws, codes, regulations, rules and orders relating to the employment of labor, working conditions, and payments to laborers for Work performed or provided by laborers.

4.22 State Audit. Pursuant to and in accordance with the provisions of Government Code §8546.7, or any amendments thereto, all books, records and files of the District, the Contractor, or any Subcontractor relating to the Work or the performance of work involving the expenditure of public funds in excess of Ten Thousand Dollars (\$10,000), including, but not limited to, the administration thereof, shall be subject to the examination and audit by the State Auditor of the State of California, at the request of District or as part of any audit of District, for a period of three (3) years after Final Payment is made under this Contract. Contractor shall preserve and cause to be preserved such books, records and files for the audit period. Upon request of the District, the Contractor shall make all such books, records or files available for review, inspection and/or reproduction.

ARTICLE 5: SUBCONTRACTORS

5.1 Subcontracts. Any Work performed for the Contractor by a Subcontractor shall be pursuant to a written agreement between the Contractor and such Subcontractor which specifically incorporates by reference the Contract Documents and which specifically binds the Subcontractor to the applicable terms and conditions of the Contract Documents, including without limitation, the policies of insurance required under Article 6 of these General Conditions and the termination provisions of Article 15, and obligates the Subcontractor to assume toward the Contractor all the obligations and responsibilities of the Contractor which by the Contract Documents the Contractor assumes toward the District, the Project Inspector, DSA, the Construction Manager and the Architect. The foregoing notwithstanding, no contractual relationship shall exist, or be deemed to exist, between any Subcontractor and the District, unless the Contract is terminated and District, in writing, elects to assume the Subcontract. Each Subcontract for a portion of the Work shall provide that such Subcontract may be assigned to the District if the Contract is terminated by the District pursuant to Article 15.1 hereof, subject to the prior rights of the Surety obligated under a bond relating to the Contract. The Contractor shall provide to the District copies of all executed Subcontracts and Purchase Orders to which Contractor is a party within thirty (30) days after Contractor's execution of the Agreement. During performance of the Work, the Contractor shall, from time to time, as and when requested by the District, the Architect or the Construction Manager provide the District with copies of any and all Subcontracts or Purchase Orders relating to

the Work and all modifications thereto. The Contractor's failure or refusal, for any reason, to provide copies of such Subcontracts or Purchase Orders in accordance with the two preceding sentences is Contractor's default of a material term of the Contract Documents.

5.2 Substitution of Listed Subcontractor.

5.2.1 Substitution Process. Any request of the Contractor to substitute a listed Subcontractor will be considered only if such request is in strict conformity with this Article 5.2 and California Public Contract Code §4107. All costs incurred by the District, including without limitation, costs of the Project Inspector, the Architect, the Construction Manager or attorneys fees in the review and evaluation of a request to substitute a listed Subcontractor shall be borne by the Contractor such costs may be deducted by the District from the Contract Price then or thereafter due the Contractor.

5.2.2 Responsibilities of Contractor Upon Substitution of Subcontractor. The District's consent to Contractor's substitution of a listed Subcontractor shall not relieve Contractor from its obligation to complete the Work within the Contract Time and for the Contract Price. The substitution of a listed Subcontractor shall not, under any circumstance, result in, or give rise to any to any increase of the Contract Price or the Contract Time on account of such substitution. In the event of the District's consent to the substitution of a listed Subcontractor, the Architect shall determine the extent to which, if any, revised or additional Submittals will be required of the newly substituted Subcontractor. In the event that the Architect determines that revised or additional Submittals are required of the newly substituted Subcontractor, the Architect shall promptly notify the Contractor, in writing, of such requirement. In such event, revised or additional Submittals shall be submitted to Architect not later than thirty (30) days following the date of the Architect's written notice to the Contractor pursuant to the foregoing sentence provided that if in the reasonable and good faith judgment of the Architect, the progress of the Work or completion of the Work requires submission of additional or revised Submittals by the newly substituted Subcontractor in less than thirty (30) days, the Architect shall so state in its written notice to the Contractor. In the event that the revised or additional Submittals are not submitted by Contractor within thirty (30) days, or such earlier time as determined by the Architect pursuant to the preceding sentence, following the Architect's written notice of the requirement for revised or additional Submittals, Contractor shall be subject to the per diem assessments for late Submittals as set forth in Article 4.7.2.1 of these General Conditions. Any revised or additional Submittals required pursuant to this Article 5.2.2 shall conform to the requirements of Article 4.7 of these General Conditions. Contractor shall reimburse the District for all fees and costs, including without limitation fees of the Construction Manager, Architect and/or any design consultant to the Architect or the District and DSA fees, incurred or associated with the processing, review and evaluation of any revised or additional Submittals required pursuant to this Article 5.2.2 the District may deduct such fees and costs from any portion of the Contract Price then or thereafter due the Contractor. In the event that additional or revised Submittals are required pursuant to this Article 5.2.2, such requirement shall not result in an increase to the Contract Time or the Contract Price.

5.3 Subcontractors' Work. Whenever the Work of a Subcontractor is dependent upon the Work of the Contractor or another Subcontractor, the Contractor shall require the Subcontractor to: (a) coordinate its Work with the dependent Work (b) provide necessary dependent data and requirements (c) supply and/or install items to built into the dependent Work of others (d) make appropriate provisions for dependent Work of others (e) carefully examine and understand the portions of the Contract Documents (including Drawings, Specifications and

Field Clarifications) and Submittals relating to the dependent Work and (f) examine the existing dependent Work and verify that the dependent Work is in proper condition for the Subcontractor's Work. If the dependent Work is not in a proper condition, the Subcontractor shall notify the Contractor in writing and not proceed with the Subcontractor's Work until the dependent Work has been corrected or replaced and is in a proper condition for the Subcontractor's Work.

- 5.4 Subcontractors' Compliance With LCP.** As applicable, each Subcontractor performing Work shall comply with the LCP. A material obligation of the Contractor is its enforcement of Subcontractor obligations relating to the LCP failure of the Contractor to strictly enforce such Subcontractor obligations is a material obligation of the Contractor under the Contract Documents.

ARTICLE 6: INSURANCE; INDEMNITY; BONDS

- 6.1 Workers' Compensation Insurance; Employer's Liability Insurance.** The Contractor shall purchase and maintain Workers' Compensation Insurance as will protect the Contractor from claims under workers' or workmen's compensation, disability benefit and other similar employee benefit acts which are applicable to the Work to be performed, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. Contractor shall purchase and maintain Employer's Liability Insurance covering bodily injury (including death) by accident or disease to any employee which arises out of the employee's employment by Contractor. The Employer's Liability Insurance required of Contractor hereunder may be obtained by Contractor as a separate policy of insurance or as an additional coverage under the Workers' Compensation Insurance required to be obtained and maintained by Contractor hereunder. The limits of liability for the Employer's Liability Insurance required hereunder shall be as set forth in the Special Conditions.
- 6.2 Commercial General Liability and Property Insurance.** The Contractor shall purchase and maintain Commercial General Liability and Property Insurance covering the types of claims set forth below which may arise out of or result from Contractor's operations under the Contract Documents and for which the Contractor may be legally responsible: (i) claims for damages because of bodily injury, sickness or disease or death of any person other than the Contractor's employees (ii) claims for damages insured by usual personal injury liability coverage which are sustained (a) by a person as a result of an offense directly or indirectly related to employment of such person by the Contractor, or (b) by another person (iii) claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom (iv) claims for damages because of bodily injury, death of a person or property damages arising out of ownership, maintenance or use of a motor vehicle (v) contractual liability insurance applicable to the Contractor's obligations under the Contract Documents and (vi) Completed Operations.
- 6.3 Builder's Risk "All-Risk" Insurance.** The Contractor shall obtain Builders Risk insurance covering the full insurable value of the Work from risks of loss, damage or destruction of Work in progress or in place at the Site prior to Final Acceptance including without limitation coverage for losses resulting from the perils of fire, malicious mischief, vandalism, and collapse. The Builder's Risk Insurance Policy shall include coverage for seismic risks if so indicated in the Special Conditions.
- 6.4 Insurance Policy Requirements.** Each policy of insurance required by the Contract

Documents shall confirm the following requirements.

6.4.1 Minimum Coverage Amounts. The insurance required of the Contractor hereunder shall be written for not less than any limits of liability specified in the Contract Documents, or required by law, whichever is greater. In the event of any loss or damage covered by a policy of insurance required to be obtained and maintained by the Contractor hereunder, the Contractor shall be solely and exclusively responsible for the payment of the deductible, if any, under such policy of insurance, without adjustment to the Contract Price on account thereof.

6.4.2 Required Qualifications of Insurers. The Contractor and Subcontractors' policies of Commercial General Liability and Property/Casualty insurance and the Contractor's Builders Risk insurance will be accepted by the District only if the insurer(s) are: (a) A.M. Best rated A- or better (b) A.M. Best Financial Size Category VII or higher and (c) authorized under California law to transact business in the State of California and authorized to issue insurance policies in the State of California. If at any time during performance of the Work, the insurer(s) issuing a policy of insurance covering Commercial General Liability, Property/Casualty or Builder Risk is/are not A.M. Best rated A- or better and is/are not A.M. Best Financial Size Category VII or higher, the Contractor or Subcontractor, as applicable shall within thirty (30) days of the District's written notice of the insufficiency of an insurer to the Contractor, obtain insurance coverage(s) from alternative insurer(s) who is/are then A.M. Best rated A- or better and who is/are A.M. Best Financial Size Category VII or higher. If the Contractor fails to deliver Certificate(s) of Insurance from an alternative insurer(s) meeting or exceeding the A.M. Best rating and A.M. Best Financial Size Category set forth above, within thirty (30) days of the date of the District's issuance of a written notice pursuant to the preceding sentence, in addition to any other right or remedy of the District under the Contract Documents or arising by operation of law, the District may withhold disbursement of any Progress Payment otherwise due hereunder until the Contractor has delivered such Certificate(s) of Insurance from an alternative insurer(s).

6.5 Evidence of Insurance; Subcontractor's Insurance.

6.5.1 Certificates of Insurance. Prior to commencing the Work, Contractor shall deliver to the District Certificates of Insurance evidencing the insurance coverages required by the Contract Documents. Failure or refusal of the Contractor to so deliver Certificates of Insurance may be deemed by the District to be a default of a material obligation of the Contractor under the Contract Documents, and thereupon the District may proceed to exercise any right or remedy provided for under the Contract Documents or at law. The Certificates of Insurance and the insurance policies required by the Contract Documents shall contain a provision that coverages afforded under such policies will not be canceled or allowed to expire until at least thirty (30) days prior written notice has been given to the District. The insurance policies required of Contractor hereunder shall also name the District, the Architect and the Construction Manager as additional insureds as their interests may appear. Should any policy of insurance be canceled before Final Acceptance of the Work by the District and the Contractor fails to immediately procure replacement insurance as required, the District reserves the right to procure such insurance and to deduct the premium cost thereof and other costs incurred by the District in connection therewith from any sum then or thereafter due the Contractor under the Contract Documents. The Contractor shall, from time to time, furnish the District, when requested, with satisfactory proof of coverage of each type of insurance required by the Contract

Documents failure of the Contractor to comply with the District's request may be deemed by the District to be a default of a material obligation of the Contractor under the Contract Documents.

- 6.5.2 Subcontractors' Insurance.** Contractor shall require that every Subcontractor, of any tier, performing or providing any portion of the Work obtain and maintain the policies of insurance set forth in Articles 6.1 and 6.2 of these General Conditions the coverages and limits of liability of such policies of insurance to be obtained and maintained by Subcontractors shall be as set forth in the Special Conditions. The policies of insurance to be obtained and maintained by Subcontractors hereunder are in addition to, and not in lieu of, Contractor obtaining and maintaining such policies of insurance. Each of the policies of insurance obtained and maintained by a Subcontractor hereunder shall conform with the requirements of this Article 6. Upon request of the District, Contractor shall promptly deliver to the District Certificates of Insurance evidencing that the Subcontractors have obtained and maintained policies of insurance in conformity with the requirements of this Article 6. Failure or refusal of the Contractor to provide the District with Subcontractors' Certificates of Insurance evidencing the insurance coverages required hereunder is a material default of Contractor hereunder.
- 6.6 Maintenance of Insurance.** Any insurance bearing on the adequacy of performance of Work shall be maintained after the District's Final Acceptance of all of the Work for the full one year correction of Work period and any longer specific guarantee or warranty periods set forth in the Contract Documents. Should such insurance be canceled before the end of any such periods and the Contractor fails to immediately procure replacement insurance as specified, the District reserves the right to procure such insurance and to charge the cost thereof to the Contractor. Nothing contained in these insurance requirements is to be construed as limiting the extent of the Contractor's responsibility for payment of damages resulting from its operations or performance of the Work under the Contract Documents, including without limitation the Contractor's obligation to pay Liquidated Damages. In no instance will the District's exercise of its option to occupy and use completed portions of the Work relieve the Contractor of its obligation to maintain insurance required under this Article until the date of Final Acceptance of the Work by the District, or such time thereafter as required by the Contract Documents. The insurer providing any insurance coverage required hereunder shall be to the reasonable satisfaction of the District.
- 6.7 Contractor's Insurance Primary.** All insurance and the coverages thereunder required to be obtained and maintained by Contractor hereunder, if overlapping with any policy of insurance maintained by the District, shall be deemed to be primary and non-contributing with any policy maintained by the District and any policy or coverage thereunder maintained by District shall be deemed excess insurance. To the extent that the District maintains a policy of insurance covering property damage arising out of the perils of fire or other casualty covered by the Contractor's Builder's Risk Insurance or the Comprehensive General Liability Insurance of the Contractor or any Subcontractor, the District, Contractor and all Subcontractors waive rights of subrogation against the others. The costs for obtaining and maintaining the insurance coverages required herein shall be included in the Contract Price.
- 6.8 Indemnity.** Unless arising solely out of the active negligence, gross negligence or willful misconduct the District or the Architect, the Contractor shall indemnify, defend and hold harmless the Indemnified Parties who are: (i) the District and its Board of Trustees, officers, employees, agents and representatives (including the Project Inspector) (ii) the Architect and its consultants for the Work and their respective agents and employees and (iii) the

Construction Manager and its agents and employees. The Contractor's obligations hereunder includes indemnity, defense and hold harmless of the Indemnified Parties from and against any and all damages, losses, claims, demands or liabilities whether for damages, losses or other relief, including, without limitation attorneys fees and costs which arise, in whole or in part, from the Work, the Contract Documents or the acts, omissions or other conduct of the Contractor, any Subcontractor or any person or entity engaged by them for the Work. The Contractor's obligations under the foregoing include without limitation: (i) injuries to or death of persons (ii) damage to property or (iii) theft or loss of property (iv) Stop Notice claims asserted by any person or entity in connection with the Work and (v) other losses, liabilities, damages or costs resulting from, in whole or part, any acts, omissions or other conduct of Contractor, any of Contractor's Subcontractors, of any tier, or any other person or entity employed directly or indirectly by Contractor in connection with the Work and their respective agents, officers or employees. The obligations of the Contractor, as set forth in (v) above shall include, without limitation losses, costs, expenses, damages and other claims asserted by any other Contractor to the District in connection with the Work or in connection with a work of improvement related to or affected by the Work. If any action or proceeding, whether judicial, administrative, arbitration or otherwise, shall be commenced on account of any claim, demand or liability subject to Contractor's obligations hereunder, and such action or proceeding names any of the Indemnified Parties as a party thereto, the Contractor shall, at its sole cost and expense, defend the named Indemnified Parties in such action or proceeding with counsel reasonably satisfactory to the named Indemnified Parties. In the event that there shall be any judgment, award, ruling, settlement, or other relief arising out of any such action or proceeding to which any of the Indemnified Parties are subject to, or bound by, Contractor shall pay, satisfy or otherwise discharge any such judgment, award, ruling, settlement or relief Contractor shall indemnify and hold harmless the Indemnified Parties from any and all liability or responsibility arising out of any such judgment, award, ruling, settlement or relief. The Contractor's obligations hereunder are binding upon Contractor's Performance Bond Surety and these obligations shall survive notwithstanding Contractor's completion of the Work or the termination of the Contract.

- 6.9 Payment Bond; Performance Bond.** Prior to commencement of the Work, the Contractor shall furnish a Performance Bond as security for Contractor's faithful performance of the Contract and a Labor and Material Payment Bond as security for payment of persons or entities performing work, labor or furnishing materials in connection with Contractor's performance of the Work under the Contract Documents. Unless otherwise stated in the Special Conditions, the amounts of the Performance Bond and the Payment Bond required hereunder shall be one hundred percent (100 %) of the Contract Price. Said Labor and Material Payment Bond and Performance Bond shall be in the form and content set forth in the Contract Documents. The failure or refusal of the Contractor to furnish either the Performance Bond or the Labor and Material Payment Bond in strict conformity with this Article 6.9 may be deemed by the District as a default by the Contractor of a material obligation hereunder. Upon request of the Contractor, the District may consider and accept, but is not obligated to do so, multiple sureties on such bonds. The Surety on any bond required under the Contract Documents shall be: (i) an Admitted Surety Insurer as that term is defined in California Code of Civil Procedure §995.120 (ii) A.M. Best rated A- or better and (iii) A.M. Best Financial Size Category VII or better. The Contractor's delivery of Bonds issued by a Surety who does not meet or exceed each of the criteria set forth above will be rejected.

ARTICLE 7: CONTRACT TIME

7.1 Substantial Completion of the Work Within Contract Time. Unless otherwise expressly provided in the Contract Documents, the Contract Time is the period of time, including authorized adjustments thereto, allotted in the Contract Documents for achieving Substantial Completion of the Work. The date for commencement of the Work is the date established by the Notice to Proceed issued by the District pursuant to the Agreement, which shall not be postponed by the failure to act of the Contractor or of persons or entities for whom the Contractor is responsible. The date of Substantial Completion is the date certified by the Architect and the Project Inspector as such in accordance with the Contract Documents.

7.2 Progress and Completion of the Work.

7.2.1 Time of Essence. Time limits stated in the Contract Documents are of the essence. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing and achieving Substantial Completion of the Work. The Contractor shall employ and supply a sufficient force of workers, material and equipment, and prosecute the Work with diligence so as to maintain progress, to prevent Work stoppage and to achieve Substantial Completion of the Work within the Contract Time.

7.2.2 Substantial Completion. Substantial Completion is that stage in the progress of the Work when the Work is complete in accordance with the Contract Documents so the District can occupy or use the Work for its intended purpose. Substantial Completion shall be determined by the Architect, the Construction Manager and the Project Inspector upon request by the Contractor in accordance with the Contract Documents. The good faith and reasonable determination of Substantial Completion by the Project Inspector, the Construction Manager and the Architect shall be controlling and final.

7.2.3 Correction or Completion of the Work After Substantial Completion.

7.2.3.1 Punchlist. Upon achieving Substantial Completion of the Work, the District, The Project Inspector, the Construction Manager, the Architect and the Contractor shall jointly review the Work and prepare a comprehensive list of items of the Work to be corrected or completed by the Contractor (“the Punchlist”). The exclusion of, or failure to include, any item on the Punchlist shall not alter or limit the obligation of the Contractor to complete or correct any portion of the Work in accordance with the Contract Documents.

7.2.3.2 Time for Completing Punchlist Items. In addition to setting forth items for correction or completion pursuant to Article 7.2.3.1, the Construction Manager, if any, Contractor and Architect shall, after the jointly review, establish a reasonable time for Contractors’ completion of all Punchlist items. If mutual agreement is not reached for the Contractor’s completion of Punchlist items, the Architect shall determine such time, and in such event, the time determined by the Architect shall be final and binding upon the District and Contractor so long as the Architect’s determination is made in good faith. The Contractor shall promptly and diligently proceed to complete all Punchlist items within the time established. In the event that the Contractor shall fail or refuse, for any reason, to complete all Punchlist items within the time established, Contractor shall be subject to assessment of Liquidated Damages in accordance with Article 7.4 hereof. The foregoing notwithstanding, if the Contractor fails or refuses to complete all Punchlist items, the District may in its sole and exclusive discretion and without further notice to Contractor, elect to cause the completion of all remaining Punchlist items provided, however that such election by the District is in addition to

and not in lieu of any other right or remedy of the District under the Contract Documents or at law. If the District elects to complete Punchlist items of the Work, pursuant to the foregoing, Contractor shall be responsible for all costs incurred by the District in connection herewith and the District may deduct such costs from the Contract Price then or thereafter due the Contractor, if these costs exceed the remaining Contract Price due to the Contractor, the Contractor and the Performance Bond Surety are liable to District for any such excess costs

7.2.4 Final Completion. Final Completion is that stage of the Work when all Work has been completed in accordance with the Contract Documents, including without limitation, the performance of all correction or completion items noted upon Substantial Completion, and the Contract has been otherwise fully performed by the Contractor. Final Completion shall be determined by the Architect and the Project Inspector upon request of the Contractor. The good faith and reasonable determination of Final Completion by the Project Inspector and the Architect shall be controlling and final.

7.2.5 Contractor Responsibility for Multiple Inspections. In the event the Contractor shall request determination of Substantial Completion or Final Completion by the Project Inspector and the Architect and it is determined by the Project Inspector and the Architect that the Work does not then justify certification of Substantial Completion or Final Completion and re-inspection is required at a subsequent time to make such determination, the Contractor shall be responsible for all costs of such re-inspection, including without limitation, the fees of the Architect and the salary of the Project Inspector. The District may deduct such costs from the Contract Price then due or thereafter due to the Contractor.

7.2.6 Final Acceptance. Final Acceptance of the Work shall occur upon approval of the Work by the District's Board of Trustees such approval shall be submitted for adoption at the next regularly scheduled meeting of the District's Board of Trustees after the determination of Final Completion. The commencement of any warranty or guarantee period under the Contract Documents shall be deemed to be the date upon which the District's Board of Trustees approves of the Final Acceptance of the Work.

7.3 Construction Schedule.

7.3.1 General Construction Schedule Requirements. Unless otherwise provided in the Special Conditions, the Construction Schedules required under this Article 7 shall (i) indicate the date(s) for commencement and completion of various portions of the Work including without limitation, procurement, fabrication and delivery of major items, materials or equipment (ii) indicate manpower and other resources required for completion of each Construction Schedule activity (iii) indicate costs for completion of each Construction Schedule activity (iv) identify each Submittal required by the Contract Documents, the date for the Contractor's submission of each Submittal and the date for the return of the reviewed Submittal to the Contractor (v) no Site activity shall reflect a duration of less than one (1) or more than fifteen (15) working days (vi) no more than twenty five percent (25 %) of the total number of activities shown on any Construction Schedule shall be critical path activities or near critical path activities; "near critical path" is defined as float less than ten (10) working days (viii) indicate major milestones, including without limitation, development of Punchlists and completion of Punchlists, equipment start-up and testing, close-out activities and (ix) shall incorporate an activity code structure sufficient to allow future sorting/grouping by responsibility, Site area/location, CSI divisions and Milestones.

Failure by the Contractor to include any element of the Work required by the Contract Documents or completion of the Work shall not excuse the Contractor from completing all work required within the Contract Time, notwithstanding District's, Construction Manager's and Architect's acceptance of any Construction Schedule prepared by the Contractor.

7.3.2 Submittal of Preliminary Construction Schedule. Within ten (10) days following execution of the Agreement, the Contractor shall prepare and submit one (1) electronic and two (2) hard copies to the District, the Construction Manager and the Architect a Preliminary Construction Schedule indicating, in graphic form, the estimated rate of progress and sequence of all Work required under the Contract Documents. Failure of the Contractor to submit the Preliminary Construction Schedule within said ten (10) days will result in assessment of Liquidated Damages as set forth in the Special Conditions for each calendar beyond such ten (10) day period, until the Preliminary Construction Schedule is submitted by the Contractor. The purpose of the Preliminary Construction Schedule is to ensure adequate planning and execution of the Work so that it is completed within the Contract Time and to permit evaluation of the progress of the Work. The Contractor may submit a Preliminary Construction Schedule depicting completion of the Work in a duration shorter than the Contract Time provided that such Preliminary Construction 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 Preliminary Construction Schedule be the basis for any extension of the Contract Time, the Contractor's entitlement to any extension of the Contract Time shall be based upon the Contract Time and not on any shorter duration which may be depicted in the Contractor's Preliminary Construction Schedule. If the Construction Schedules required under this Article 7.3 incorporate therein any "float" time, such float shall be deemed to jointly belong to and owned by the District and the Contractor. As used herein, "float time" shall be deemed to refer to the time between earliest finish date and the latest finish date of each activity shown on the Construction Schedule.

7.3.3 Review of Preliminary Construction Schedule. The District, the Construction Manager and the Architect shall review the Preliminary Construction Schedule submitted by the Contractor pursuant to Article 7.3.1 above for conformity with the requirements of the Contract Documents. Within fifteen (15) days of the date of receipt of the Preliminary Construction Schedule, the Preliminary Construction Schedule will be returned to the Contractor with comments to the form or content thereof. Review of the Preliminary Progress Schedule and any comments thereto by the District, the Construction Manager and/or the Architect shall not be deemed to be the assumption of construction means, methods or sequences by the District, the Construction Manager or the Architect, all of which remain the Contractor's obligations under the Contract Documents.

7.3.4 Preparation and Submittal of Contract Construction Schedule. Within ten (10) days of the District's return of the Preliminary Construction Schedule to the Contractor pursuant to Article 7.3.2 above, the Contractor shall prepare and submit to the District, Architect and the Construction Manager the Construction Schedule which incorporates therein the comments to the Preliminary Construction Schedule. Upon the Contractor's submittal of such Construction Schedule, the District, the Construction Manager and the Architect shall review the same for purposes of determining conformity with the requirements of the Contract Documents. Within fifteen (15) days of the receipt of the Construction Schedule, the District will accept such Construction Schedule or will return the same to the Contractor with comments to the form or content. In the event there are comments to the form or content thereof, the Contractor, shall within seven (7) days of

receipt of such comments, revise and resubmit the Construction Schedule incorporating therein such comments. Upon the District's acceptance of the form and content of a Construction Schedule, the same shall be deemed the "Accepted Construction Schedule." The District's acceptance of a Construction Schedule shall be for the sole and limited purpose of determining conformity with the requirements of the Contract Documents. By the Accepted Construction Schedule, the District shall not be deemed to have exercised control over, or approval of, construction means, methods or sequences, all of which remain the responsibility and obligation of the Contractor in accordance with the terms of the Contract Documents. Further, the Accepted Construction Schedule shall not operate to limit or restrict any of Contractor's obligations under the Contract Documents nor relieve the Contractor from the full, faithful and timely performance of such obligations in accordance with the terms of the Contract Documents. The activities, commencement and completion dates of activities, and the sequencing of activities depicted on the Accepted Construction Schedule shall not be modified or revised by the Contractor without the prior consent, or direction, of the District, Construction Manager and the Architect. Updates to the Accepted Construction Schedule pursuant to Article 7.3.5 below shall not be deemed revisions to the Accepted Construction Schedule. In the event that the Accepted Construction Schedule shall depict completion of the Work in a duration shorter than the Contract Time, the same shall not be a basis for an adjustment of the Contract Time or the Contract Price in the event that actual completion of the Work shall occur after such the time depicted in such Accepted Construction Schedule. In such event, the Contract Price shall not be subject to adjustment on account of any additional costs incurred by the Contractor to complete the Work prior to the Contract Time, as adjusted in accordance with the terms of the Contract Documents. Any adjustment of the Contract Time or the Contract Price shall be based upon the Contract Time set forth in the Contract Documents and not any shorter duration which may depicted in the Accepted Construction Schedule.

7.3.5 Revisions to Accepted Construction Schedule. In the event that the progress of the Work or the sequencing of the activities of the Work shall materially differ from that indicated in the Accepted Construction Schedule, as determined by the District in its reasonable discretion and judgment, the District may direct the Contractor to revise the Accepted Construction Schedule within fifteen (15) days of the District's direction, the Contractor shall prepare and submit to the District, Architect and the Construction Manager a revised Accepted Construction Schedule, for review and approval by the District. The Contractor may request consent of the District to revise the Accepted Construction Schedule. Any such request shall be considered by the District only if in writing setting forth the Contractor's proposed revision(s) to the Accepted Construction Schedule and the reason(s) therefor. The District may consent to, or deny, any such request of the Contractor to revise the Accepted Construction Schedule in its reasonable discretion.

7.3.6 Updates to Accepted Construction Schedule.

7.3.6.1 Updated Construction Schedule Requirements. The Contractor shall monitor and update the Accepted Construction Schedule on a monthly basis, or more frequently as required by the conditions or progress of the Work, or as may be requested by the District. The Contractor shall provide the District, the Construction Manager and the Architect with Updated Accepted Construction Schedules indicating progress achieved and activities commenced or completed within the prior Updated Accepted Construction Schedule. Updates to the Accepted Construction Schedule shall not include any revisions to the activities, commencement and completion dates of activities or the sequencing of activities depicted on the Accepted Construction

Schedule. Any such revisions to the Accepted Construction Schedule shall result in the District's rejection of such update and Contractor shall, within seven (7) days of the District's rejection of such update, submit to the Architect and the Construction Manager an Updated Accepted Construction Schedule which does not incorporate any such revisions. The Contractor shall also submit, with its updates to the Accepted Construction Schedule a narrative statement including a description of current and anticipated problem areas of the Work, delaying factors and their impact, and an explanation of corrective action taken or proposed by the Contractor. If the progress of the Work is behind the Accepted Construction Schedule, the Contractor shall indicate what measures will be taken to place the Work back on schedule. The District may, from time to time, and in the District's sole and exclusive discretion, transmit to the Contractor's Performance Bond Surety the Accepted Construction Schedule, any updates thereof and the narrative statement described hereinabove. The District's election to transmit, or not to transmit such information, to the Contractor's Performance Bond Surety shall not limit the Contractor's obligations under the Contract Documents.

7.3.6.2 Monthly Submission of Updated Construction Schedules. Concurrently with its submission of its Applications for Progress Payments, the Contractor shall submit the Updated Construction Schedule for the immediately preceding month. Each submission of a monthly Updated Construction Schedule shall consist of: (i) one (1) reproducible copy (ii) three (3) color copies and (iii) electronic file stored on CD or DVD. If a narrative report accompanies any monthly Updated Construction Schedule, the Contractor shall submit four (4) copies of such narratives.

7.3.7 Contractor Responsibility for Construction Schedule. The Contractor shall be responsible for the preparation, submittal and maintenance of the Construction Schedules required by the Contract Documents, and any failure of the Contractor to do so may be deemed by the District as the Contractor's default in the performance of a material obligation of the Contractor under Contract Documents. Any and all costs or expenses required or incurred to prepare, submit, revise, maintain or update the Construction Schedules shall be solely that of the Contractor and no such cost or expense shall be charged to the District. The Contract Price shall not be subject to adjustment on account of costs, fees or expenses incurred or associated with the Contractor's preparation, submittal, and maintenance or updating of the Construction Schedules.

7.3.8 Three (3) Week Look-Ahead Schedule; One (1) Week As Built Schedule. A combined three (3) week Look-Ahead Schedule for the three (3) week period immediately following each weekly Progress Meeting with a one (1) week As-Built Schedule for the previous week shall be prepared by the Contractor and submitted by the Contractor to the Construction Manager for review and approval at each weekly Progress Meeting. The Contractor's preparation and submittal of the Three (3) Week Look-Ahead Schedule One (1) Week As Built Schedule described above are material obligations of the Contractor failure or refusal of the Contractor to strictly comply with the foregoing shall be a basis for the District's exercise of the default termination procedures set forth in the Contract Documents.

7.3.9 Unanticipated Unusually Severe Weather Conditions. The Baseline Construction Schedule and all subsequent Construction Schedule Updates shall incorporate a critical path activity entitled "Remaining Inclement Weather Days" which shall be the last activity in each Construction Schedule prior to the activity entitled "Final Completion". The sole

successor to “Remaining Inclement Weather Days” (with zero lag) shall be “Final Completion” and the sole predecessor (with zero lag) shall be “Punchlist”.

The Contractor shall apply in writing to the District to use an Inclement Weather Day only when a critical path activity on the then current Updated Construction Schedule has been delayed because of inclement weather conditions. The duration of the “Remaining Inclement Weather Days” activity shall be reduced by the number of approved work days of actual weather caused delay, and be included in the monthly schedule updates.

The “Remaining Inclement Weather Days” activity shall have an initial duration as set forth in the Special Conditions, Paragraph 4.3. If, at Final Completion, there are inclement weather days remaining, the unused days shall be considered “float” as defined by Paragraph 7.3.1 of the General Conditions. If, additional inclement weather days are required, the District shall adjust the Substantial Completion date accordingly.

7.3.10 Construction Schedules; Conditions Precedent To Progress Payment Disbursements. In addition to, and not in lieu of conditions precedent set forth elsewhere in the Contract Documents relating to the District’s disbursement of Progress Payments, the Contractor’s preparation and submission of the Preliminary Construction Schedule, Construction Schedule Updates and the Three (3) Week Look-Ahead Schedule One (1) Week As Built Schedule in accordance with the Contract Documents requirements are conditions precedent to the District’s obligation to disburse any Progress Payment to the Contractor.

7.3.11 Contractor Schedule Compliance Obligations. If in the sole reasonable judgment of the District: (i) the Contractor’s progress of Work is materially behind that indicated in the then current Construction Schedule or (ii) the Contractor’s progress of Work will not result in the Contractor’s achievement of Substantial Completion within the Contract Time or the Contractor’s completion of Milestones/Phases of the Work as required by the Contract Documents, the Contractor shall take the action(s) described herein, as directed or authorized by the District. Unless the actions of the District, Construction Manager, Architect or Project Inspector are the sole causative factors resulting in delayed progress of the Work or the inability to achieve Substantial Completion within the Contract Time, the Contractor’s actions hereunder shall not result in adjustment of the Contract Time or the Contract Price. Actions to be directed or authorized by the District include, without limitation, the Contractor’s (i) increase of labor resources (whether on-Site or off-Site) (ii) increase the number of working hours per shift, increase the number of shifts per working day, increase the number of working days and/or increase Construction Equipment at the Site and/or (iii) re-sequence Work activities to achieve maximum concurrent performance and completion of multiple Work activities.

7.4 Adjustment of Contract Time. If Substantial Completion is delayed, adjustment, if any, to the Contract Time on account of such delay shall be in accordance with this Article 7.4.

7.4.1 Excusable Delays. If Substantial Completion of the Work is delayed by Excusable Delays, the Contract Time shall be subject to adjustment for such reasonable period of time as determined by the Architect. Excusable Delays shall not result in any increase in the Contract Price. Excusable Delays refer to unforeseeable and unavoidable casualties or other unforeseen causes beyond the control, and without fault or neglect, of the Contractor, any Subcontractor, Material Supplier or other person directly or indirectly engaged by the Contractor in performance of any portion of the Work. Excusable Delays

include unanticipated and unavoidable labor disputes, unusual and unanticipated delays in transportation of equipment, materials or Construction Equipment reasonably necessary for completion and proper execution of the Work, unanticipated unusually severe weather conditions or DSA directive to stop the Work. Neither the financial resources of the Contractor or any person or entity directly or indirectly engaged by the Contractor in performance of any portion of the Work shall be deemed conditions beyond the control of the Contractor. If an event of Excusable Delay occurs, the Contract Time shall be subject to adjustment hereunder only if the Contractor establishes: (i) full compliance with all applicable provisions of the Contract Documents relative to the method, manner and time for Contractor's notice and request for adjustment of the Contract Time; (ii) that the event(s) forming the basis for Contractor's request to adjust the Contract Time are outside the reasonable control and without any fault or neglect of the Contractor or any person or entity directly or indirectly engaged by Contractor in performance of any portion of the Work and (iii) that the event(s) forming the basis for Contractor's request to adjust the Contract Time directly and adversely impacted the critical path of the Work as indicated in the Approved Construction Schedule or the most recent updated Approved Construction Schedule relative to the date(s) of the claimed event(s) of Excusable Delay. The foregoing provisions notwithstanding, if the Special Conditions set forth a number of "Rain Days" to be anticipated during performance of the Work, the Contract Time shall not be adjusted for rain related unusually severe weather conditions until and unless the actual number of Rain Days during performance of the Work shall exceed those noted in the Special Conditions and such additional Rain Days shall have directly and adversely impacted the critical path of the Work as depicted in the Approved Construction Schedule or the most recent updated Approved Construction Schedule relative to the date(s) of such additional Rain Days.

7.4.2 Compensable Delays. If Substantial Completion of the Work is delayed and such delay is caused by the acts or omissions of the District, the Architect, the Inspector of Record, or separate contractor employed by the District (collectively "Compensable Delays"), upon Contractor's request and notice, in strict conformity with Articles 7 and 9 of these General Conditions, the Contract Time will be adjusted by Change Order for such reasonable period of time as determined by the Architect and the District. In accordance with California Public Contract Code §7102, if the Contractor's progress is delayed by any of the events described in the preceding sentence, Contractor shall not be precluded from the recovery of damages directly and proximately resulting therefrom, provided that the District is liable for the delay, the delay is unreasonable under the circumstances involved and the delay was not within the reasonable contemplation of the District and the Contractor at the time of execution of the Agreement. In such event, Contractor's damages, if any, shall be limited to direct, actual and unavoidable additional costs of labor, materials or Construction Equipment directly resulting from such delay, and shall exclude indirect or other consequential damages. Except as expressly provided for herein, Contractor shall not have any other claim, demand or right to adjustment of the Contract Price arising out of delay, interruption, hindrance or disruption to the progress of the Work. Adjustments to the Contract Price and the Contract Time, if any, on account of Changes to the Work or Suspension of the Work shall be governed by the applicable provisions of the Contract Documents, including without limitation, Articles 9 and 14 of these General Conditions.

7.4.3 Unexcusable Delays. Unexcusable Delays refer to any delay to the progress of the Work caused by events or factors other than those specifically identified in Articles 7.4.1 and 7.4.2 above. Neither the Contract Price nor the Contract Time shall be adjusted on account of Unexcusable Delays.

7.4.4 Adjustment of Contract Time.

7.4.4.1 Procedure for Adjustment of Contract Time. The Contract Time shall be subject to adjustment only in strict conformity with applicable provisions of the Contract Documents. Failure of Contractor to request adjustment(s) of the Contract Time in strict conformity with applicable provisions of the Contract Documents shall be deemed Contractor's waiver of the same.

7.4.4.1.1 Contractor Notice of Adjustment of Contract Time. The Contract Time shall be subject to adjustment only if the Contractor provides notice of an adjustment of the Contract Time and all supporting substantiation and documentation of the basis and extent of the requested Contract Time adjustment in strict conformity to Article 9.6 of these General Conditions.

7.4.4.1.2 Time Impact Evaluation. The supporting substantiation and documentation of the basis and extent of Contract Time adjustments required by the provisions of Article 9.6 shall include, without limitation, a complete Time Impact Evaluation ("TIE") of the factors justifying an adjustment of the Contract Time and the extent of such adjustment of the Contract Time.

7.4.4.2 Limitations Upon Adjustment of Contract Time on Account of Delays. Any adjustment of the Contract Time on account of an Excusable Delay or a Compensable Delay shall be limited as set forth herein. If an Excusable Delay and a Compensable Delay occur concurrently, the maximum extension of the Contract Time shall be the number of days from the commencement of the first delay to the cessation of the delay which ends last. If an Unexcusable Delay occurs concurrently with either an Excusable Delay or a Compensable Delay, the maximum extension of the Contract Time shall be the number of days, if any, which the Excusable Delay or the Compensable Delay exceeds the period of time of the Unexcusable Delay. In addition to the foregoing limitations upon extension of the Contract Time, no adjustment of the Contract Time shall be made on account of any Excusable Delays or Compensable Delays unless such delay(s) actually and directly impact Work or Work activities on the critical path of the then current and updated Approved Construction Schedule as of the date on which such delay first occurs. The District shall not be deemed in breach of, or otherwise in default of any obligation hereunder, if the District shall deny any request by the Contractor for an adjustment of the Contract Time for any delay which does not actually and directly impact Work or Work activities on the critical path of the then current and updated Approved Construction Schedule.

7.5 Liquidated Damages. Should the Contractor neglect, fail or refuse to: (i) submit the Preliminary Construction Schedule within the time set forth in the Contract Documents (ii) submit Submittals in accordance with Submittal Schedule incorporated into the Accepted Construction Schedule (iii) achieve Substantial Completion of the Work within the Contract Time, (subject to adjustments authorized under the Contract Documents) or (iv) to complete Punchlist items within the time established pursuant to the Contract Documents, the Contractor agrees to pay to the District the amount of per diem Liquidated Damages set forth in the Special Conditions, not as a penalty but as Liquidated Damages. The Liquidated Damages amounts set forth in the Special Conditions are agreed upon by and between the Contractor and the District because of the difficulty of fixing the District's actual damages in the event of the Contractor's delayed submission of the Preliminary Construction Schedule, delayed submission of Submittals, delayed Substantial Completion or delayed completion of

Punchlist items. The Contractor and the District specifically agree that said amounts are reasonable estimates of the District's damages in such event, and that such amounts do not constitute a penalty. Liquidated Damages may be deducted by the District from the Contract Price then or thereafter due the Contractor. The Contractor and the Surety shall be liable to the District for any Liquidated Damages exceeding any amount of the Contract Price then held or retained by the District. In the event that the Contractor shall fail or refuse to complete Punchlist items and the District elects to exercise its right to cause completion or correction of such items pursuant to Article 7.2.3.2 hereof, the District's assessment of Liquidated Damages pursuant to the foregoing shall be in addition, and not in lieu of, the District's right to charge Contractor with the cost of completing or correcting such items of the Work, as provided for under Article 7.2.3.2. The Contractor and the District acknowledge and agree that the provisions of this Article 7.5 are reasonable under the circumstances existing at the time of the Contractor's execution of the Agreement.

- 7.6 District Right to Take-Over Work.** Unless caused by the District, Architect, Construction Manager or the Project Inspector, if the Contractor fails or refuses, for any reason and at any time, to furnish adequate materials, labor, equipment or services to maintain progress of the Work in accordance with the then current Construction Schedule after twenty-four (24) hours advance written notice from the Construction Manager to the Contractor of its failure or refusal, the District may thereafter furnish or cause to be furnish such materials, labor, equipment or services necessary to maintain progress of the Work in accordance with the then current Construction Schedule. All costs, expenses or other charges (whether direct, indirect and administrative) incurred by the District in furnishing such materials, labor, equipment or services shall be at the sole cost of the Contractor and the District may deduct the same from the Contract Price then or thereafter due the Contractor. The District's exercise of rights pursuant to the foregoing shall not be deemed a waiver or limitation of any other right or remedy of the District under the Contract Documents.

ARTICLE 8: CONTRACT PRICE

- 8.1 Contract Price.** The Contract Price is the amount stated in the Agreement as such, and subject to any authorized adjustments thereto in accordance with the Contract Documents, is the total amount payable by the District to the Contractor for performance of the Work under the Contract Documents. The District's payment of the Contract Price to the Contractor shall be in accordance with the Contract Documents.
- 8.2 Cost Breakdown.** Within fifteen (15) days of the execution of the Agreement by Contractor, Contractor shall furnish, on forms approved by the District, a detailed estimate and complete Cost Breakdown of the Contract Price. The Cost Breakdown shall be subject to review and approval by the Construction Manager, Architect and District of the form and content thereof. In the event that the District shall reasonably object to any portion of the Cost Breakdown, within ten (10) days of the District's receipt of the Cost Breakdown, the District shall notify the Contractor, in writing of the District's objection(s) to the Cost Breakdown. Within five (5) days of the date of the District's written objection(s), Contractor shall submit a revised Cost Breakdown to the District, Architect and the Construction Manager for review and acceptance. The foregoing procedure for the preparation, review and approval of the Cost Breakdown shall continue until the District, Architect and the Construction Manager have approved of the entirety of the Cost Breakdown. Once the Cost Breakdown is accepted by the District, Architect and the Construction Manager, the Cost Breakdown shall not be thereafter modified or amended by the Contractor without the prior consent and approval of the District, Architect and the Construction Manager, which may be granted or withheld in

their sole reasonable discretion.

8.3 Progress Payments.

8.3.1 Applications for Progress Payments. During the Contractor's performance of the Work, the Contractor shall submit monthly, on the first working day of each month, to the Project Inspector, Construction Manager and the Architect, Applications for Progress Payments, on forms approved by the District, setting forth an itemized estimate of Work completed in the preceding month for the purpose of the District's making of Progress Payments thereon. Values utilized in the Applications for Progress Payments shall be based upon the District accepted Cost Breakdown pursuant to Article 8.2 above and such values shall be only for determining the basis of Progress Payments to Contractor, and shall not be considered as fixing a basis for adjustments, whether additive or deductive, to the Contract Price, or for determining the extent of Work actually completed.

8.3.2 Initial Progress Payment Meeting. Prior to submitting any Application for Progress Payment and for the purpose of expediting review of Application for Progress Payments and disbursement of Progress Payments, Contractor agrees to meet with the Project Inspector, Construction Manager and Architect to review and discuss each of the Contractor's Proposed Applications for Progress Payment. If any item submitted for payment is disputed during this review, Contractor agrees to use its best efforts to resolve the disputed items with Project Inspector, Construction Manager and Architect before formally submitting the Application for Progress Payment. The Architect, the Construction Manager and District specifically reserve the right to dispute any item included in Contractor's Application for Progress Payment, regardless of whether such item was identified as disputed in the initial review process provided for herein.

8.3.3 District's Review of Applications for Progress Payments. In accordance with Public Contract Code §20104.50, upon receipt of an Application for Progress Payment, the District shall cause the same to be reviewed by the Project Inspector, the Construction Manager, if one is designated by the District, and the Architect, as soon as is practicable after receipt of such Application for Progress Payment. Such review shall be for the purpose of determining that the Application for Progress Payment is a proper Progress Payment request. For purposes of this Article 8.3.2, an Application for Progress Payment shall be deemed "proper" only if it is submitted on the form approved by the District, with all of the requested information of such form of Application for Progress Payment completely and accurately provided by the Contractor and such completed Application for Progress Payment is accompanied by: (i) a Certification, executed under penalty of perjury by the Contractor's Superintendent and/or Construction Manager, that all weekly Certified Payroll Records for the Contractor and all Subcontractors required to submit weekly Certified Payroll Records under the LCP for the period of time covered by the Application for Progress Payment have been completed and submitted in strict conformity with the LCP (ii) Certified Payrolls of the any Subcontractors, of any tier, (who are not required under the LCP to submit Certified Payroll Records on weekly basis) for laborers performing any portion of the Work for which a Progress Payment is requested (iii) duly completed and executed forms of Conditional Waiver and Release of Rights Upon Progress Payment in accordance with California Civil Code §3262 of the Contractor, all Subcontractors of any tier, and Material Suppliers covering the Progress Payment requested (iv) duly completed and executed forms of Unconditional Waiver and Release of Rights upon Progress Payment in accordance with California Civil Code §3262 of the Contractor, all Subcontractors of any tier, and Material Suppliers covering the Progress Payment received

by the Contractor under the prior Application for Progress Payment (v) an updated Construction Schedule in accordance with Article 7.3.5 of the General Conditions and applicable provisions of the Specifications relating to the Contractor's updates to the Construction Schedule (vi) for the first (1st) Application for Progress Payment, a certification that the Preliminary Construction Schedule conforming to requirements of the Contract Documents has been prepared and submitted by the Contractor for subsequent Applications for Progress Payment a certification by the Contractor that it has continuously maintained, or caused to maintained, the Record Drawings reflecting the actual as-built conditions of the Work performed be for which the Progress Payment is requested, it being understood that such certification is subject to verification by the District, Architect, Project Inspector or the Construction Manager prior to disbursement of the Progress Payment and (vii) completed/executed form of Debris Recycling Statement. In accordance with Public Contract Code §20104.50, an Application for Progress Payment determined by the District not to be a proper Application for Progress Payment shall be returned by the District to the Contractor as soon as is practicable after receipt of the same from the Contractor, but in no event not more than seven (7) days after the District's receipt thereof. The District's return of any Application for Progress Payment pursuant to the preceding sentence shall be accompanied by a written document setting forth the reason(s) why the Application for Progress Payment is not proper.

8.3.4 Review of Applications for Progress Payments. Upon receipt of an Application for Progress Payment, the Architect, Construction Manager and the Project Inspector shall inspect and verify the Work to determine whether it has been performed in accordance with the terms of the Contract Documents and to determine the portion of the Application for Progress Payment which is properly due to the Contractor under the terms of the Contract Documents.

8.3.5 District's Disbursement of Progress Payments

8.3.5.1 Timely Disbursement of Progress Payments. In accordance with Public Contract Code §20104.50, within thirty (30) days after the District's receipt of a proper Application for Progress Payment, there shall be paid, by District, to Contractor a sum equal to ninety-five percent (95 %) of the value of the Work indicated in the Application for Progress Payment which is actually in place as of the date of the Application for Progress Payment and as verified and approved by the Project Inspector and the Architect and the pro rata portion of the Contractor's overhead, supervision and general conditions costs and profit for that month provided, however, that the District's obligation to disburse any Progress Payment shall be subject to the District's receipt of all documents set forth in Article 8.3.3 above, each and all of which are conditions precedent to the District's obligation to disburse Progress Payments. If an Application for Progress Payment is determined not to be proper due to the failure or refusal of the Contractor to submit documents with the Application for Progress Payment, as required by Article 8.3.2, or incompleteness or inaccuracies in any such documents submitted or if it is reasonably determined that the Record Drawings have not been continuously maintained to reflect the actual as built conditions of the Work completed in the period for which the Progress Payment is requested, the thirty (30) day period hereunder for the District's timely disbursement of a Progress Payment shall be deemed to commence on the date that the District is actually in receipt of documents not submitted with the Application for Progress Payment, or corrections to documents with the Application for Progress Payment so as to render them complete and accurate, or the date upon which the Contractor accurately and fully

completes preparation of the Record Drawings relating to the Work for which the Progress Payment is requested.

8.3.5.2 Untimely Disbursement of Progress Payments. In accordance with Public Contract Code §20104.50, in the event that the District shall fail to make any Progress Payment within thirty (30) days after receipt of an undisputed and properly submitted Application for Progress Payment, the District shall pay the Contractor interest on the undisputed amount of such Application for Progress Payment equal to the legal rate of interest set forth in California Code of Civil Procedure §685.010(a). The foregoing notwithstanding, in the event that the District shall determine that any Application for Progress Payment is not proper, pursuant to Article 8.3.3 above, and the District does not return such Application for Progress Payment within the seven (7) day period provided for in Article 8.3.3, the period of time for the District's disbursement of the Progress Payment on such Application for Progress Payment without incurring the interest liability shall be reduced by the number of days exceeding the seven (7) day return period.

8.3.5.3 District's Right to Disburse Progress Payments by Joint Checks. Provided that the District is in receipt of the applicable Subcontract or Purchase Order, the District, may in its sole discretion, issue joint checks to the Contractor and such Subcontractor or Material Supplier in satisfaction of its obligation to make Progress Payments or the Final Payment due hereunder.

8.3.5.4 No Waiver of Defective or Non-Conforming Work. The approval of any Application for Progress Payment or the disbursement of any Progress Payment to the Contractor shall not be deemed nor constitute acceptance of defective Work or Work not in conformity with the Contract Documents.

8.3.6 Progress Payments for Changed Work. The Contractor's Applications for Progress Payment may include requests for payment on account of Changes in the Work which have been properly authorized and approved by the Project Inspector, the Architect and all other governmental agencies with jurisdiction over such Change in accordance with the terms of the Contract Documents and for which a Change Order has been issued. Except as provided for herein, no other payment shall be made by the District for Changes in the Work.

8.3.7 Materials or Equipment Not Incorporated Into the Work.

8.3.7.1 Limitations Upon Payment. Except as expressly provided for herein, no payments shall be made by the District on account of any item of the Work, including without limitation, materials or equipment which, at the time of the Contractor's submittal of an Application for Progress Payment, has/have not been incorporated into and made a part of the Work.

8.3.7.2 Materials or Equipment Delivered and Stored at the Site. The District may, in its sole and exclusive discretion, make payment for materials or equipment not yet incorporated into the Work if, at or prior to the time of the Contractor's submittal of an Application for Progress Payment incorporating therein a request for payment of such materials or equipment if all of the following are complied with: (i) the materials or equipment have been delivered to the Site (ii) adequate arrangements, reasonably satisfactory to the District, have been made by the Contractor to store and protect

such materials or equipment at the Site including without limitation, insurance reasonably satisfactory to the District, covering and protecting against the risk of loss, destruction, theft or other damage to such materials or equipment while in storage if such coverage is not afforded under the policy of Builder's Risk insurance obtained by the District pursuant to the Contract Documents and (iii) the establishment of procedures reasonably satisfactory to the District by which title to such materials or equipment will be vested in the District upon the District's payment therefor. The Contractor acknowledges that the discretion to make, or not to make, payment for materials or equipment delivered or stored at the site of the Work pursuant to the preceding sentence shall be exercised exclusively by the District the District's exercise of discretion not to make payment for materials or equipment delivered or stored at the Site, but not yet incorporated into the Work shall not be deemed the District's default hereunder. In the event that the District shall elect to make payment for materials or equipment delivered and stored at the Site, the costs and expenses incurred to comply with the requirements of (ii) and (iii) of this Article 8.3.6.2 shall be borne solely and exclusively by the Contractor and no payment shall be made by the District on account of such costs and expenses.

8.3.7.3 Materials or Equipment Not Delivered or Stored at the Site. No payments shall be made by the District for materials or equipment to be incorporated into the Work where such materials or equipment have not been delivered or stored at the Site. The foregoing notwithstanding, the District may, in its sole and exclusive discretion, elect to make payment for materials or equipment not incorporated into the Work and which are not delivered or stored at the Site at or prior to the time of the Contractor's submittal of an Application for Progress Payment incorporating therein a request for payment of such materials or equipment provided that each and all of the following have been complied with: (i) adequate arrangements, reasonably satisfactory to the District, have been made by the Contractor to store and protect such materials or equipment which include without limitation, insurance reasonably satisfactory to the District, covering and protecting against the risk of loss, destruction, theft or other damage to such materials or equipment while in storage if coverage for the same is not afforded under the policy of Builder's Risk insurance obtained by the District pursuant to the Contract Documents and (ii) the establishment of procedures reasonably satisfactory to the District by which title to such materials or equipment will be vested in the District upon the District's payment therefor. The Contractor acknowledges that the discretion to make, or not to make, payment for such materials or equipment pursuant to the preceding sentence shall be exercised exclusively by the District the District's exercise of discretion not to make payment for such materials or equipment shall not be deemed the District's default hereunder. In the event that the District shall elect to make payment for materials or equipment not at the Site, the costs and expenses incurred to comply with the requirements of (i) and (ii) of this Article 8.3.7.3 shall be borne solely and exclusively by the Contractor and no payment shall be made by the District on account of such costs and expenses.

8.3.7.4 Materials or Equipment in Fabrication or Transit. The provisions of this Article 8.3.7 notwithstanding, the District shall not make any payment on account of any materials or equipment which is in the process of being fabricated or which are in transit to the Site of or other storage location.

8.3.8 Exclusions From Progress Payments. In addition to the District's right to withhold disbursement of any Progress Payment provided for in the Contract Documents, neither

the Contractor's Application for Progress Payment shall include, nor shall the District be obligated to disburse any portion of the Contract Price for amounts which the Contractor does not intend to pay any Subcontractor, of any tier, or Material Supplier because of a dispute or any other reason.

8.3.9 Title to Work. The Contractor warrants that title to all Work covered by an Application for Progress Payment will pass to the District no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Progress Payment, all Work for which a Progress Payment has been previously issued and the Contractor has received payment from the District therefor shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, stop notices, security interests or encumbrances in favor of the Contractor, Subcontractors, Material Suppliers or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

8.3.10 Substitute Security for Retention. In accordance with the provisions of California Public Contract Code §22300, eligible and equivalent securities may be substituted for any monies withheld by the District to ensure the Contractor's performance under the Contract Documents at the request and expense of the Contractor and in conformity with the provisions of California Public Contract Code §22300. The foregoing and the provisions of California Public Contract Code §22300 notwithstanding, failure of the Contractor to request the substitution of eligible and equivalent securities for monies to be withheld by the District prior to the Contractor's submission of its first Application for Progress Payment shall be deemed a waiver of such right.

8.4 Final Payment.

8.4.1 Application for Final Payment. When the Contractor has achieved Final Completion of the Work and has otherwise fully performed its obligations under the Contract Documents, the Contractor shall submit an Application for Final Payment on such form as approved by the District. Thereupon, the Architect and the Project Inspector will promptly make a final inspection of the Work and when the Architect and the Project Inspector find the Work acceptable under the Contract Documents and that the Contract has been fully performed by the Contractor, the Architect and the Project Inspector will thereupon promptly approve the Application for Final Payment, stating that to the best their knowledge, information and belief, the Work has been completed in accordance with the terms of the Contract Documents. The Final Payment shall include the remaining balance of the Contract Price and any retention from Progress Payments previously withheld by the District.

8.4.2 Conditions Precedent to Disbursement of Final Payment. Neither Final Payment nor any remaining Contract Price shall become due until the Contractor submits to the District each and all of the following, the submittal of which are conditions precedent to the District's obligation to disburse the Final Payment: (i) an affidavit or certification by the Contractor that payrolls, bills for materials and other indebtedness incurred in connection with the Work for which the District or the District's property may or might be responsible or encumbered have been paid or otherwise satisfied (ii) a certificate evidencing that insurance required by the Contract Documents to remain in force after the Contractor's receipt of Final Payment is currently in effect (iii) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover any period following Final Payment as required by the Contract Documents (iv) consent of the Surety

on the Labor and Material Payment Bond and Performance Bond, to Final Payment if required (v) duly completed and executed forms of Conditional or Unconditional Waivers and Releases of rights upon Final Payment of the Contractor, Subcontractors of any tier and Material Suppliers in accordance with California Civil Code §3262, with each of the same stating that there are, or will be, no claims for additional compensation after disbursement of the Final Payment (vi) Operations and Maintenance manuals and separate warranties provided by any manufacturer or distributor of any materials or equipment incorporated into the Work (vii) the Record Drawings (viii) the form of Guarantee included in the Contract Documents duly executed by an authorized representative of the Contractor (ix) any and all other items or documents required by the Contract Documents to be delivered to the District upon completion of the Work (x) the completion and submittal of all reports required by the Contract Documents, including without limitation, verified reports required by applicable provisions of the California Code of Regulations and (xi) if required by the District, such other data establishing payment or satisfaction of obligations such as receipts, releases and waivers of liens, stop notices, claims, security interest or encumbrances arising out of the Contract to the extent and in such form as may be required by the District.

8.4.3 Disbursement of Final Payment. Provided that the District is then in receipt of all documents and other items in Article 8.4.2 above as conditions precedent to the District's obligation to disburse Final Payment, not later than sixty (60) days following Final Acceptance the District shall disburse the Final Payment to the Contractor. Pursuant to California Public Contract Code §7107, if there is any dispute between the District and the Contractor at the time that disbursement of the Final Payment is due, the District may withhold from disbursement of the Final Payment an amount not to exceed one hundred fifty percent (150 %) of the amount in dispute.

8.4.4 Waiver of Claims. The Contractor's acceptance of the Final Payment is a waiver and release by the Contractor of any and all claims against the District for compensation or otherwise in connection with the Contractor's performance of the Contract.

8.4.5 Claims Asserted After Final Payment. Any lien, stop notice or other claim filed or asserted after the Contractor's acceptance of the Final Payment by any Subcontractor, of any tier, laborer, Material Supplier or others in connection with or for Work performed under the Contract Documents shall be the sole and exclusive responsibility of the Contractor who further agrees to indemnify, defend and hold harmless the District and its officers, agents, representatives and employees from and against any claims, demands or judgments arising or associated therewith, including without limitation attorneys fees incurred by the District in connection therewith. In the event any lien, stop notice or other claim of any Subcontractor, Laborer, Material Supplier or others performing Work under the Contract Documents remain unsatisfied after Final Payment is made, Contractor shall refund to District all monies that the District may pay or be compelled to pay in discharging any lien, stop notice or other claim, including, without limitation all costs and reasonable attorneys fees incurred by District in connection therewith.

8.5 Withholding of Payments. The District may withhold any Progress Payment or the Final Payment, in whole or in part, or backcharge the Contractor to the extent it may deem advisable to protect the District on account of: (i) defective Work or Work not in conformity with the requirements of the Contract Documents which is not remedied (ii) failure of the Contractor to make payments when due Subcontractors or Material Suppliers for materials or labor (iii) claims filed or reasonable evidence of the probable filing of claims by

Subcontractors, laborers, Material Suppliers, or others performing any portion of the Work under the Contract Documents for which the District may be liable or responsible including, without limitation, Stop Notice Claims filed with the District pursuant to California Civil Code §3179 et seq. (iv) a reasonable doubt that the Contract can be completed for the then unpaid balance of the Contract Price (v) tax demands filed in accordance with California Government Code §12419.4 (vi) other claims, penalties and/or forfeitures for which the District is required or authorized to retain funds otherwise due the Contractor (vii) any amounts due from the Contractor to the District under the terms of the Contract Documents (viii) violations of the LCP or other obligations of the Contractor or any Subcontractor relating to the employment of labor in connection with the Work (including without limitation, delinquent submission of weekly Certified Payroll Records or the submission of inadequate weekly Certified Payroll Records or (ix) the Contractor's failure to perform any of its obligations under the Contract Documents or its default under the Contract Documents or its failure to maintain adequate progress of the Work. In addition to the foregoing, the District shall not be obligated to process any Application for Progress Payment or Final Payment, nor shall Contractor be entitled to any Progress Payment or Final Payment so long as any lawful or proper direction concerning the Work or the performance thereof or any portion thereof, given by the District, the Project Inspector, the Architect or any public authority having jurisdiction over the Work, or any portion thereof, shall not be fully and completely complied with by the Contractor. When the District is reasonably satisfied that the Contractor has remedied any such deficiency, payment shall be made of the amount withheld. In lieu of making payment of withheld amounts to the Contractor, the District may, in its sole exclusive discretion, apply withheld amounts to the payment and satisfactions of debts and obligations of the Contractor relating to the Work. In doing, the District shall be an agent of the Contractor for the sole and limited purpose of making payment(s) to others for the Work on behalf of the Contractor payments made by the District pursuant to the foregoing shall be deemed payments to the Contractor and the Contract Price shall be adjusted to reflect such payment(s). The District shall not be liable to the Contractor or others for its good faith decision to make or not make payment(s) of amounts withheld from the Contractor pursuant to the foregoing. If the District elects to make payments to other of amounts withheld from the Contractor, the District may do so without prior judicial determination the District will render the Contractor a complete and accurate accounting of amounts withheld and paid to others on behalf of the Contractor.

8.6 Payments to Subcontractors. The Contractor shall pay all Subcontractors for and on account of Work of the Contract performed by such Subcontractors in accordance with the terms of their respective subcontracts and as provided for pursuant to California Public Contract Code §10262, the provisions of which are deemed incorporated herein by this reference. In the event of the Contractor's failure to make payment to Subcontractors in conformity with California Public Contract Code §10262, the provisions of California Public Contract Code §10253 shall apply by this reference, the provisions of California Public Contract Code §10253 are incorporated herein in its entirety, except that the references in said Section 10253 to "the director" shall be deemed to refer to the District. The Contractor shall timely make payment of retention due Subcontractors in accordance with Public Contract Code §7107.

8.7 Computerized Job Cost Reporting System.

8.7.1 Job Cost Reporting. The Contractor and each Subcontractor with a Subcontract valued at Five Hundred Thousand Dollars (500,000) or greater shall maintain a computerized job cost reporting system conforming to the requirements set forth herein.

The computer program(s) utilized by the Contractor and applicable Subcontractors shall be subject to the review and acceptance by the District. The job cost reporting systems for the Work shall be updated in regular intervals of not less than one (1) calendar month.

8.7.2 Job Cost Reporting System Requirements. The computerized job cost programs utilized by the Contractor and applicable Subcontractors shall conform and comply with generally accepted accounting principles applied in a consistent manner and with recognized and generally accepted construction industry accounting standards, guidelines and procedures. The job cost reporting system format and configuration shall follow the general format of the District approved Cost Breakdown and budgets established for each line item shall be traceable to a bid estimate of costs. The job cost reporting systems utilized by the Contractor and applicable Subcontractors shall be capable of: (a) providing overall cost status on a monthly and cumulative basis (b) providing comparative analysis of the original budgeted costs, actual costs, remaining budget, and projected cost of completion the job cost reporting system shall be capable of providing comparative analysis for individual line items and the totality of the Work reflected in the job cost report and (c) tracking adjustments to original budget amounts for Changes to the Work (including, without limitation, issued, pending and potential Change Orders).

8.7.3 Job Cost System Information. Upon request of the District or the Construction Manager, the Contractor and applicable Subcontractors shall make available written job cost reports and provide the District and the Construction Manager with the electronic files of the then current or requested job cost report. The Contractor's obligations hereunder are material.

ARTICLE 9: CHANGES

9.1 Changes in the Work. The District, at any time, by written order, may make Changes within the general scope of the Work under the Contract Documents or issue additional instructions, require additional Work or direct deletion of Work. The Contractor shall not proceed with any Change involving an increase or decrease in the Contract Price or the Contract Time without prior written authorization from the District. The foregoing notwithstanding, the Contractor shall promptly commence and diligently complete any Change to the Work subject to the District's written authorized issued pursuant to the preceding sentence the Contractor shall not be relieved or excused from its prompt commencement and diligent completion of any Change subject to the District's written authorization by virtue of the absence or inability of the Contractor and the District to agree upon the extent of any adjustment to the Contract Time or the Contract Price on account of such Change. The issuance of a Change Order pursuant to this Article 9 in connection with any Change authorized by the District under this Article 9.1 shall not be deemed a condition precedent to Contractor's obligation to promptly commence and diligently complete any such Change authorized by the District hereunder. The District's right to make Changes shall not invalidate the Contract nor relieve the Contractor of any liability or other obligations under the Contract Documents. Any requirement of notice of Changes in the scope of Work to the Surety shall be the responsibility of the Contractor. Changes to the Work depicted or described in the Drawings or the Specifications shall be subject to approval by the DSA. The District may make Changes to bring the Work or the Project into compliance with environmental requirements or standards established by state or federal statutes and regulations enacted after award of the Contract.

9.2 Oral Order of Change in the Work. Any oral order, direction, instruction, interpretation, or determination from the District, the Project Inspector or the Architect which in the opinion of

the Contractor causes any change to the scope of the Work, or otherwise requires an adjustment to the Contract Price or the Contract Time, shall be treated as a Change only if the Contractor gives the Architect and the Project Inspector written notice within ten (10) days of the order, directions, instructions, interpretation or determination and prior to acting in accordance therewith. Time is of the essence in Contractor's written notice pursuant to the preceding sentence so that the District can promptly investigate and consider alternative measures to address the order, direction, instruction, interpretation or determination giving rise to Contractor's notice. Accordingly, Contractor acknowledges that its failure, for any reason, to give written notice within ten (10) days of such order, direction, instruction, interpretation or determination shall be deemed Contractor's waiver of any right to assert or claim any entitlement to an adjustment of the Contract Time or the Contract Price on account of such order, direction, instruction, interpretation or determination. The written notice shall state the date, circumstances, extent of adjustment to the Contract Price or the Contract Time, if any, requested, and the source of the order, directions, instructions, interpretation or determination that the Contractor regards as a Change. Unless the Contractor acts in strict accordance with this procedure, any such order, direction, instruction, interpretation or determination shall not be treated as a Change and the Contractor hereby waives any claim for any adjustment to the Contract Price or the Contract Time on account thereof.

9.3 Contractor Submittal of Data. Within ten (10) days after receipt of a written order directing a Change in the Work or furnishing the written notice regarding any oral order directing a Change in the Work, the Contractor shall submit to the Architect, the Project Inspector, the Construction Manager and the District a detailed written statement setting forth the general nature of the Change, the amount of any adjustment to the Contract Price on account thereof, properly itemized and supported by sufficient substantiating data to permit evaluation of the same, and the extent of adjustment of the Contract Time, if any, required by such Change. No claim or adjustment to the Contract Price or the Contract Time shall be allowed if not asserted by the Contractor in strict conformity herewith or if asserted after Final Payment is made under the Contract Documents.

9.4 Adjustment to Contract Price and Contract Time on Account of Changes to the Work.

9.4.1 Adjustment to Contract Price. Adjustments to the Contract Price due to Changes in the Work shall be determined by application of one of the following methods, in the following order of priority:

9.4.1.1 Mutual Agreement. By negotiation and mutual agreement, on a lump sum basis, between the District and the Contractor on the basis of the estimate of the actual and direct increase or decrease in costs on account of the Change. Upon request of the District or the Architect, the Contractor shall provide a detailed estimate of increase or decrease in costs directly associated with performance of the Change along with cost breakdowns of the components of the Change and supporting data and documentation. The Contractor's estimate of increase or decrease in costs pursuant to the foregoing, if requested, shall be in sufficient detail and in such form as to allow the District, the Project Inspector and the Architect to review and assess the completeness and accuracy thereof. The Contractor shall be solely responsible for any additional costs or additional time arising out of, or related in any manner to, its failure to provide the estimate of costs within the time specified in the request of the District or the Architect for such estimate.

9.4.1.2 Determination by the District. By the District, whether or not negotiations are

initiated pursuant to Article 9.4.1.1 above based upon actual and necessary costs incurred by the Contractor as determined by the District on the basis of the Contractor's records. In the event that the procedure set forth in this Article 9.4.1.2 is utilized to determine the extent of adjustment to the Contract Price on account of Changes to the Work, promptly upon determining the extent of adjustment to the Contract Price, the District shall notify the Contractor in writing of the same the Contractor shall be deemed to have accepted the District's determination of the amount of adjustment to the Contract Price on account of a Change to the Work unless Contractor shall notify the District, the Architect and the Project Inspector, in writing, not more than fifteen (15) days from the date of the District's written notice, of any objection to the District's determination. Failure of the Contractor to timely notify the District, the Architect and the Project Inspector of Contractor's objections to the District's determination of the extent of adjustment to the Contract Price shall be deemed Contractor's acceptance of the District's determination and a waiver of any right or basis of the Contractor to thereafter protest or otherwise object to the District's determination. Notwithstanding any objection of the Contractor to the District's determination of the extent of any adjustment to the Contract Price pursuant to this Article 9.4.1.2, Contractor shall, pursuant to Article 9.7 below, diligently proceed to perform and complete any such Change.

9.4.1.3 Basis for Adjustment of Contract Price. If Changes in the Work require an adjustment of the Contract Price pursuant to Articles 9.4.1.1 or 9.4.1.2 above, the basis for adjustment of the Contract Price shall be as follows:

9.4.1.3.1 Labor. Contractor shall be compensated for the costs of labor actually and directly utilized in the performance of the Change. Such labor costs shall be limited to field labor for which there is a prevailing wage rate classification. Wage rates for labor shall not exceed the prevailing wage rates in the locality of the Site and shall be in the labor classification(s) necessary for the performance of the Change. Use of a labor classification which would increase labor costs associated with any Change shall not be permitted. Labor costs shall exclude costs incurred by the Contractor in preparing estimate(s) of the costs of the Change, in the maintenance of records relating to the costs of the Change, coordination and assembly of materials and information relating to the Change or performance thereof, or the supervision and other overhead and general conditions costs associated with the Change or performance thereof.

9.4.1.3.2 Materials and Equipment. Contractor shall be compensated for the costs of materials and equipment necessarily and actually used or consumed in connection with the performance of Changes. Costs of materials and equipment may include reasonable costs of transportation from a source closest to the site of the Work and delivery to the Site. If discounts by Material Suppliers are available for materials necessarily used in the performance of Changes, they shall be credited to the District. If materials and/or equipment necessarily used in the performance of Changes are obtained from a supplier or source owned in whole or in part by the Contractor, compensation therefor shall not exceed the current wholesale price for such materials or equipment. If, in the reasonable opinion of the District, the costs asserted by the Contractor for materials and/or equipment in connection with any Change is excessive, or if the Contractor fails to provide satisfactory evidence of the actual costs of such materials and/or equipment from its supplier or vendor of the same, the costs of such materials

and/or equipment and the District's obligation for payment of the same shall be limited to the then lowest wholesale price at which similar materials and/or equipment are available in the quantities required to perform the Change. The District may elect to furnish materials and/or equipment for Changes to the Work, in which event the Contractor shall not be compensated for the costs of furnishing such materials and/or equipment or any mark-up thereon.

9.4.1.3.3 Construction Equipment. Contractor shall be compensated for the actual cost of the necessary and direct use of Construction Equipment in the performance of Changes to the Work. Use of such Construction Equipment in the performance of Changes to the Work shall be compensated in increments of fifteen (15) minutes. Rental time for Construction Equipment moved by its own power shall include time required to move such Construction Equipment to the site of the Work from the nearest available rental source of the same. If Construction Equipment is not moved to the Site by its own power, Contractor will be compensated for the loading and transportation costs in lieu of rental time. The foregoing notwithstanding, neither moving time or loading and transportation time shall be allowed if the Construction Equipment is used for performance of any portion of the Work other than Changes to the Work. Unless prior approval in writing is obtained by the Contractor from the Architect, the Project Inspector and the District, no costs or compensation shall be allowed for time while Construction Equipment is inoperative, idle or on standby, for any reason. The Contractor shall not be entitled to an allowance or any other compensation for Construction Equipment or tools used in the performance of Changes to the Work where such Construction Equipment or tools have a replacement value of 500.00 or less. Construction Equipment costs claimed by the Contractor in connection with the performance of any Change to the Work shall not exceed rental rates established by distributors or construction equipment rental agencies in the locality of the Site any costs asserted which exceed such rental rates shall not be allowed or paid. Unless otherwise specifically approved in writing by the Architect, the Project Inspector and the District, the allowable rate for the use of Construction Equipment in connection with Changes to the Work shall constitute full compensation to the Contractor for the cost of rental, fuel, power, oil, lubrication, supplies, necessary attachments, repairs or maintenance of any kind, depreciation, storage, insurance, labor (exclusive of labor costs of the Construction Equipment operator), and any all other costs incurred by the Contractor incidental to the use of such Construction Equipment.

9.4.1.3.4 Mark-up on Costs of Changes to the Work. In determining the cost to the District and the extent of increase to the Contract Price resulting from a Change adding to the Work, the allowance for mark-ups on the costs of the Change for all overhead (including home office and field overhead), general conditions costs and profit associated with the Change shall not exceed the percentage set forth in the Special Conditions, regardless of the number of Subcontractors, of any tier, performing any portion of any Change to the Work. If a Change to the Work reduces the Contract Price, no profit, general conditions or overhead costs shall be paid by the District to the Contractor for the reduced or deleted Work. In such event, the adjustment to the Contract Price shall be the actual cost reduction realized by the reduced or deleted Work multiplied by the percentage set forth in the Special Conditions for mark-ups on the cost of a Change adding to the scope of the Work.

9.4.1.3.5 Contractor Maintenance of Records. In the event that Contractor shall be directed to perform any Changes to the Work pursuant to Article 9.1 or 9.2, or should the Contractor encounter conditions which the Contractor, pursuant to Article 9.6, believes would obligate the District to adjust the Contract Price and/or the Contract Time, Contractor shall maintain detailed records on a daily basis. Such records shall include without limitation hourly records for labor and Construction Equipment and itemized records of materials and equipment used that day in connection with the performance of any Change to the Work. In the event that more than one Change to the Work is performed by the Contractor in a calendar day, Contractor shall maintain separate records of labor, Construction Equipment, materials and equipment for each such Change. In the event that any Subcontractor, of any tier, shall provide or perform any portion of any Change to the Work, Contractor shall require that each such Subcontractor maintain records in accordance with this Article. Each daily record maintained hereunder shall be signed by Contractor's Superintendent or Contractor's authorized representative such signature shall be deemed Contractor's representation and warranty that all information contained therein is true, accurate, complete and relate only to the Change referenced therein. All records maintained by a Subcontractor, of any tier, relating to the costs of a Change to the Work shall be signed by such Subcontractor's authorized representative or Superintendent. All records maintained hereunder shall be subject to inspection, review and/or reproduction by the District, the Architect or the Project Inspector upon request. In the event that Contractor shall fail or refuse, for any reason, to maintain or make available for inspection, review and/or reproduction such records and the adjustment to the Contract Price on account of any Change to the Work is determined pursuant to this Article, the District's reasonable good faith determination of the extent of adjustment to the Contract Price on account of such Change shall be final, conclusive, dispositive and binding upon Contractor. Contractor's obligation to maintain records hereunder is in addition to, and not in lieu of, any other Contractor obligation under the Contract Documents with respect to Changes to the Work.

9.4.2 Adjustment to Contract Time. In the event of any Change(s) to the Work pursuant to this Article 9, the Contract Time shall be extended or reduced by Change Order for a period of time commensurate with the time reasonably necessary to perform such Change. In the event that any Change shall require an extension of the Contract Time, the Contractor shall not be subject to Liquidated Damages for such period of time. If completion of the Work is delayed by causes for which the District is responsible and the delay is unreasonable under the circumstances involved, and not within the contemplation of the Contractor and the District at the time of execution of the Agreement, the Contractor shall not be precluded from the recovery of damages arising therefrom.

9.4.3 Addition or Deletion of Alternate Bid Item(s). If the Bid for the Work includes proposal(s) for Alternate Bid Item(s), during Contractor's performance of the Work, the District may elect, pursuant to this Article to add any such Alternate Bid Item(s) if the same did not form a basis for award of the Contract or delete any such Alternate Bid Item(s) if the same formed a basis for award of the Contract. If the District elects to add or delete any such Alternate Bid Item(s) pursuant to the foregoing, the cost or credit for such Alternate Bid Item(s) shall be as set forth in the Contractor's Bid. If any Alternate Bid Item is added or deleted from the Work pursuant to the foregoing, the Contract Time shall be adjusted by the number of days allocated for the added or deleted Alternate Bid Item in the

Contract Documents if days are not allocated for any Alternate Bid Item added or deleted pursuant to the foregoing, the Contract Time shall be equitably adjusted.

9.5 Change Orders. If the District approves of a Change, a written Change Order prepared by the Architect on behalf of the District shall be forwarded to the Contractor describing the Change and setting forth the adjustment to the Contract Time and the Contract Price, if any, on account of such Change. All Change Orders shall be in full payment and final settlement of all claims for direct, indirect and consequential costs, including without limitation, costs of delays or impacts related to, or arising out of, items covered and affected by the Change Order, as well as any adjustments to the Contract Time. Any claim or item relating to any Change incorporated into a Change Order not presented by the Contractor for inclusion in the Change Order shall be deemed waived. The Contractor shall execute the Change Order prepared pursuant to the foregoing once the Change Order has been prepared and forwarded to the Contractor for execution, without the prior approval of the District which may be granted or withheld in the sole and exclusive discretion of the District, the Contractor shall not modify or amend the form or content of such Change Order, or any portion thereof. The Contractor's attempted or purported modification or amendment of any such Change Order, without the prior approval of the District, shall not be binding upon the District any such unapproved modification or amendment to such Change Order shall be null, void and unenforceable. Unless otherwise expressly provided for in the Contract Documents or in the Change Order, any Change Order issued hereunder shall be binding upon the District only upon action of the District's Board of Trustees approving and ratifying such Change Order. In the event of any amendment or modification made by the Contractor to a Change Order for which there is no prior approval by the District, in accordance with the provisions of this Article 9.5, unless otherwise expressly stated in its approval and ratification of such Change Order, any action of the Board of Trustees to approve and ratify such Change Order shall be deemed to be limited to the Change Order as prepared by the Architect such approval and ratification of such Change Order shall not be deemed the District's approval and ratification of any unapproved amendment or modification by the Contractor to such Change Order. Change Orders shall be issued on the form of Change Order and the content thereof, as attached to the Special Conditions.

9.6 Contractor Notice of Changes. If the Contractor should claim that any instruction, request, the Drawings, the Specifications, action, condition, omission, default, or other situation obligates the District to increase the Contract Price or to extend the Contract Time, the Contractor shall notify the District, Construction Manager, Project Inspector and the Architect, in writing, of such claim within ten (10) days from the date of its actual or constructive notice of the factual basis supporting the same. The District shall consider any such claim of the Contractor only if sufficient supporting documentation is submitted with the Contractor's notice to the District, Construction Manager, Project Inspector and the Architect. Time is of the essence in Contractor's written notice pursuant to the preceding sentence so that the District can promptly investigate and consider alternative measures to the address such instruction, request, Drawings, Specifications, action, condition, omission, default or other situation. Accordingly, Contractor acknowledges that its failure, for any reason, to give written notice (with sufficient supporting documentation to permit the District's review and evaluation) within ten (10) days of its actual or constructive knowledge of any instruction, request, Drawings, Specifications, action, condition, omission, default or other situation for which the Contractor believes there should an adjustment of the Contract Time or the Contract Price shall be deemed Contractor's waiver, release, discharge and relinquishment of any right to assert or claim any entitlement to an adjustment of the Contract Time or the Contract Price on account of any such instruction, request, Drawings, Specifications, action, condition,

omission, default or other situation. In the event that the District determines that the Contract Price or the Contract Time are subject to adjustment based upon the events, circumstances and supporting documentation submitted with the Contractor's written notice under this Article 9.6, any such adjustment shall be determined in accordance with the provisions of Articles 9.4.1 and 9.4.2.

- 9.7 Disputed Changes.** In the event of any dispute or disagreement between the Contractor and the District or the Architect regarding the characterization of any item as a Change to the Work or as to the appropriate adjustment of the Contract Price or the Contract Time on account thereof, the Contractor shall promptly proceed with the performance of such item of the Work, subject to a subsequent resolution of such dispute or disagreement in accordance with the terms of the Contract Documents. The Contractor's failure or refusal to so proceed with such Work may be deemed to be Contractor's default of a material obligation of the Contractor under the Contract Documents.
- 9.8 Emergencies.** In an emergency affecting the safety of life, or of the Work, or of property, the Contractor, without special instruction or prior authorization from the District or the Architect, is permitted to act at its discretion to prevent such threatened loss or injury. Any compensation claimed by the Contractor on account of such emergency work shall be submitted and determined in accordance with this Article 9.
- 9.9 Minor Changes in the Work.** The Architect may order minor Changes in the Work not involving an adjustment in the Contract Price or the Contract Time and not inconsistent with the intent of the Contract Documents. Such Changes shall be effected by written order and shall be binding on the District and the Contractor. The Construction Manager or the Project Inspector may direct the Contractor to perform Changes provided that each such Change does not result in an increase of more than 500.00 to the Contract Price and no adjustment of the Contract Time. The Contractor shall carry out such orders promptly.
- 9.10 Unauthorized Changes.** Any Work beyond the extent of Work shown on the Contract Documents, or any extra Work performed or provided by the Contractor without notice to the Architect, the Construction Manager and the Project Inspector in the manner and within the time set forth in Articles 9.2 or 9.6 shall be considered unauthorized and at the sole expense of the Contractor. Work so done will not be measured or paid for, no extension to the Contract Time will be granted on account thereof and any such Work may be ordered removed at the Contractor's sole cost and expense. The failure of the District to direct or order removal of such Work shall not constitute acceptance or approval of such Work nor relieve the Contractor from any liability on account thereof.

ARTICLE 10: SEPARATE CONTRACTORS

- 10.1 District's Right to Award Separate Contracts.** The District reserves the right to perform construction or operations related to the Project with the District's own forces or to award separate contracts in connection with other portions of the Project or other construction or operations at or about the Site. If the Contractor claims that delay or additional cost is involved because of such action by the District, the Contractor shall seek an adjustment to the Contract Price or the Contract Time as provided for in the Contract Documents. Failure of the Contractor to request such an adjustment of the Contract Time or the Contract Price in strict conformity with the provisions of the Contract Documents applicable thereto shall be deemed a waiver of the same.

- 10.2 District's Coordination of Separate Contractors.** The District shall provide for coordination of the activities of the District's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the District in reviewing their respective Construction Schedules when directed to do so. The Contractor shall make any revisions to the Approved Construction Schedule for the Work hereunder deemed necessary after a joint review and mutual agreement. The Construction Schedules shall then constitute the Construction Schedules to be used by the Contractor, separate contractors and the District until subsequently revised.
- 10.3 Mutual Responsibility.** The Contractor shall afford the District and separate contractors' reasonable opportunity for storage of their materials and equipment and performance of their activities at the Site and shall connect and coordinate the Contractor's Work, construction and operations with theirs as required by the Contract Documents.
- 10.4 Discrepancies or Defects.** If part of the Contractor's Work depends for proper execution or results upon construction or operations by the District or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect and the Project Inspector any apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor to so report shall constitute an acknowledgment that the District's or separate contractors' completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then discoverable by the Contractor's reasonable diligence.

ARTICLE 11: TESTS AND INSPECTIONS

11.1 Tests; Inspections; Observations.

- 11.1.1 Contractor's Notice.** If the Contract Documents, laws, ordinances or any public authority with jurisdiction over the Work requires the Work, or any portion thereof, to be specially tested, inspected or approved, the Contractor shall give the Architect, the Construction Manager and the Project Inspector written notice of the readiness of such Work for observation, testing or inspection at least two (2) working days prior to the time for the conducting of such test, inspection or observation. If inspection, testing or observation is by authority other than the District, the Contractor shall inform the Project Inspector and the Construction Manager not less than two (2) working days prior to the date fixed for such inspection, test or observation. The Contractor shall not cover up any portion of the Work subject to tests, inspections or observations prior to the completion and satisfaction of the requirements of such test, inspection or observation. In the event that any portion of the Work subject to tests, inspection or approval shall be covered up by Contractor prior to completion and satisfaction of the requirements of such tests, inspection or approval, Contractor shall be responsible for the uncovering of such portion of the Work as is necessary for performing such tests, inspection or approval without adjustment of the Contract Price or the Contract Time on account thereof.
- 11.1.2 Cost of Tests and Inspections.** Except as set forth below, the District will pay for fees, costs and expenses to complete the initial tests/inspections of portions of the Work as required by law, code or regulation, provided that such tests/inspections are conducted and completed at a location within a one hundred (100) mile radius of the Site. The foregoing notwithstanding, if the portion(s) of the Work subject to tests/inspections is/are not ready for such test/inspection at the time indicated in the Contractor's notice under

Article 11.1.1 or if upon completion of such test/inspection, the portion(s) of the Work subject to such test/inspection do not meet or exceed the minimum requirements of such test/inspection, the Contractor shall be solely responsible for the payment of all fees, costs or expenses arising out of or related in any manner to subsequent tests/inspections of such portion(s) of the Work. Notwithstanding the District's payment of fees, costs or expenses for conducting initial tests/inspections, if any actions or failures to act of the Contractor or person or entity providing or performing Work under the direction or control of the Contractor require tests/inspections to be conducted over a period of more than eight (8) hours per day by any single person or on weekends/holidays, the Contractor shall be solely responsible for the payment of fees, costs or expenses which result from test/inspection services which exceed eight (8) hours per day by any single person or on weekends/holidays. If any tests/inspections are conducted outside a one hundred (100) mile radius of the Site, the Contractor shall be solely responsible for all costs, fees or expenses to conduct and complete such tests/inspections conducted at such location, including without limitation, costs to complete such tests/inspections and travel, meal and related expenses.

11.1.3 Testing/Inspection Laboratory. The District shall select duly qualified person(s) or testing laboratory(ies) to conduct the tests and inspections to be paid for by the District and required by the Contract Documents. Tests and inspections required of the Work shall be as set forth in the Contract Documents and as required by applicable law, rule or regulation, including without limitation, Title 24 of the California Code of Regulations. Test/inspection standards shall be as set forth in the Contract Documents or established by applicable law, rule or regulation. Where inspection or testing is to be conducted by an independent laboratory or testing agency, materials or samples thereof shall be selected by the laboratory, testing agency, the Project Inspector, the Construction Manager or the Architect and not by the Contractor.

11.1.4 Additional Tests, Inspections and Approvals. If the Architect, the Construction Manager, the Project Inspector or public authorities having jurisdiction over the Work determine that portions of the Work require additional testing, inspection or approval, the Architect will, upon written authorization from the District, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the District, and the Contractor shall give timely notice to the Architect, the Construction Manager and the Project Inspector of when and where tests and inspections are to be made so the Project Inspector and the Architect may observe such procedures. The District shall bear the costs of such additional tests, inspections or approvals, except to the extent that such additional tests, inspections or approvals reveal any failure of the Work to comply with the requirements of the Contract Documents, in which case the Contractor shall bear all costs made necessary by such failures, including without limitation, the costs of corrections, repeat tests, inspections or approvals and the costs of the Architect's services or its consultants in connection therewith.

11.2 Delivery of Certificates. Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Construction Manager.

11.3 Timeliness of Tests, Inspections and Approvals. Tests or inspections required and conducted pursuant to the Contract Documents shall be made or arranged by Contractor to avoid delay in the progress of the Work. Neither the Contract Time nor Contract Price shall be adjusted on account of the failure of the Contractor to timely arrange for the conduct of

required tests/inspections and the Contractor shall be liable to the District for all consequences of such failures, including without limitation, the assessment of Liquidated Damages for delayed Substantial Completion of the Work resulting from such failure of the Contractor.

ARTICLE 12: UNCOVERING AND CORRECTION OF WORK

12.1 Inspection of the Work.

12.1.1 Access to the Work. All Work and all materials and equipment forming a part of the Work or incorporated into the Work are subject to inspection by the District, the Construction Manager, the Architect and the Project Inspector for conformity with the Contract Documents. The Contractor shall, at its cost and without adjustment to the Contract Price or the Contract Time, furnish any facilities necessary for sufficient and safe access to the Work for purposes of inspection by the District, the Construction Manager, the Architect, the Project Inspector, DSA or any other public or quasi-public authority with jurisdiction over the Work or any portion thereof.

12.1.2 Limitations Upon Inspections. Inspections, tests, measurements, or other acts of the Architect, the Construction Manager and the Project Inspector hereunder are for the sole purpose of assisting them in determining that the Work, materials, equipment, progress of the Work, and quantities generally comply and conform with the requirements of the Contract Documents. These acts or functions shall not relieve the Contractor from performing the Work in full compliance with the Contract Documents. No inspection by the Architect or the Project Inspector shall constitute or imply acceptance of Work inspected. Inspection of the Work hereunder is in addition to, and not in lieu of, any other testing, inspections or approvals of the Work required under the Contract Documents.

12.2 Uncovering of Work. If any portion of the Work is covered contrary to the request of the Architect, the Construction Manager, the Project Inspector or the requirements of the Contract Documents, it must, if required by the Architect or the Project Inspector, be uncovered for observation by the Architect, Construction Manager and the Project Inspector and be replaced at the Contractor's expense without adjustment of the Contract Time or the Contract Price.

12.3 Rejection of Work. Prior to the District's Final Acceptance of the Work, any Work or materials or equipment forming a part of the Work or incorporated into the Work which is defective or not in conformity with the Contract Documents may be rejected by the District, the Construction Manager the Architect or the Project Inspector and the Contractor shall correct such rejected Work without any adjustment to the Contract Price or the Contract Time, even if the Work, materials or equipment have been previously inspected by the Architect or the Project Inspector or even if they failed to observe the defective or non-conforming Work, materials or equipment.

12.4 Correction of Work. The Contractor shall promptly correct any portion of the Work rejected by the District, the Construction Manager, the Architect or the Project Inspector for failing to conform to the requirements of the Contract Documents, or which is determined by them to be defective, whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. The Contractor shall bear all costs of correcting such rejected Work, including additional testing and inspections and compensation for the Architect's services and expenses made necessary thereby. The Contractor shall bear all

costs of correcting destroyed or damaged construction, whether completed or partially completed, of the District or separate contractors, caused by the Contractor's correction or removal of Work which is not in accordance with the requirements of the Contract Documents, or which is defective. If the Contractor fails or refuses to correct Work deemed defective or non-conforming pursuant to the foregoing, such failure or refusal shall be deemed the Contractor's default in performance of a material obligation of the Contractor hereunder. In such event, the Contractor's Performance Bond Surety shall be liable for the costs to correct such defective or non-conforming Work and/or securing the performance of an alternative contractor to complete such corrective Work.

12.5 Removal of Non-Conforming or Defective Work. The Contractor shall, at its sole cost and expense, remove from the Site all portions of the Work which are defective or are not in accordance with the requirements of the Contract Documents which are neither corrected by the Contractor nor accepted by the District.

12.6 Failure of Contractor to Correct Work. If the Contractor fails to commence to correct defective or non-conforming Work within 3 days of notice of such condition and promptly thereafter complete the same within a reasonable time, the District may correct it in accordance with the Contract Documents. If the Contractor does not proceed with correction of such defective or non-conforming Work within the time fixed herein, the District may remove it and store the salvable materials or equipment at the Contractor's expense. If the Contractor does not pay costs of such removal and storage after written notice, the District may sell such materials or equipment at auction or at private sale and shall account for the proceeds thereof, after deducting costs and damages that should have been borne by the Contractor, including without limitation compensation for the Architect's services, attorneys fees and other expenses made necessary thereby. If such proceeds of sale do not cover costs which the Contractor should have borne, the Contract Price shall be reduced by the deficiency. If payments of the Contract Price then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor and the Surety shall promptly pay the difference to the District.

12.7 Acceptance of Defective or Non-Conforming Work. The District may, in its sole and exclusive discretion, elect to accept Work which is defective or which is not in accordance with the requirements of the Contract Documents, instead of requiring its removal and correction, in which case the Contract Price shall be reduced as appropriate and equitable.

ARTICLE 13: WARRANTIES

13.1 Workmanship and Materials. The Contractor warrants to the District that all materials and equipment furnished under the Contract Documents shall be new, of good quality and of the most suitable grade and quality for the purpose intended, unless otherwise specified in the Contract Documents. All Work shall be of good quality, free from faults and defects and in conformity with the requirements of the Contract Documents. If required by the Architect or the District, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment incorporated into the Work. Any Work, or portion thereof not conforming to these requirements, including substitutions or alternatives not properly approved in accordance with the Contract Documents may be deemed defective. Where there is an approved substitution of, or alternative to, material or equipment specified in the Contract Documents, the Contractor warrants to the District that such installation, construction, material, or equipment will equally perform the function and have the quality of the originally specified material or equipment. The Contractor expressly warrants the

merchantability, the fitness for use, and quality of all substitute or alternative items in addition to any warranty given by the manufacturer or supplier of such item.

- 13.2 Warranty Work.** If, within one year after the date of Final Acceptance, or such other time frame set forth elsewhere in the Contract Documents, any of the Work is found to be defective or not in accordance with the requirements of the Contract Documents, or otherwise contrary to the warranties contained in the Contract Documents, the Contractor shall commence all necessary corrective action not more than seven (7) days after receipt of a written notice from the District to do so, and to thereafter diligently complete the same. In the event that Contractor shall fail or refuse to commence correction of any such item within said seven (7) day period or to diligently prosecute such corrective actions to completion, the District may, without further notice to Contractor, cause such corrective Work to be performed and completed. In such event, Contractor and Contractor's Performance Bond Surety shall be responsible for all costs in connection with such corrective Work, including without limitation, general administrative overhead costs of the District in securing and overseeing such corrective Work. Nothing contained herein shall be construed to establish a period of limitation with respect to any obligation of the Contractor under the Contract Documents. The obligations of the Contractor hereunder shall be in addition to, and not in lieu of, any other obligations imposed by any special guarantee or warranty required by the Contract Documents, guarantees or warranties provided by any manufacturer of any item or equipment forming a part of, or incorporated into the Work, or otherwise recognized, prescribed or imposed by law. Neither the District's Final Acceptance, the making of Final Payment, any provision in Contract Documents, nor the use or occupancy of the Work, in whole or in part, by District shall constitute acceptance of Work not in accordance with the Contract Documents nor relieve the Contractor or the Contractor's Performance Bond Surety from liability with respect to any warranties or responsibility for faulty or defective Work or materials, equipment and workmanship incorporated therein.
- 13.3 Guarantee.** Upon completion of the Work, Contractor shall execute and deliver to the District the form of Guarantee included within the Contract Documents. The Contractor's execution and delivery of the form of Guarantee is an express condition precedent to any obligation of the District to disburse the Final Payment to the Contractor.
- 13.4 Survival of Warranties.** The provisions of this Article 13 shall survive the Contractor's completion of Work under the Contract Documents, the District's Final Acceptance or the termination of the Contract.

ARTICLE 14: SUSPENSION OF WORK

- 14.1 District's Right to Suspend Work.** The District may, without cause, and without invalidating or terminating the Contract, order the Contractor, in writing, to suspend, delay or interrupt the Work in whole or in part for such period of time as the District may determine. The Contractor shall resume and complete the Work suspended by the District in accordance with the District's directive, whether issued at the time of the directive suspending the Work or subsequent thereto.
- 14.2 Adjustments to Contract Price and Contract Time.** In the event the District shall order suspension of the Work, an adjustment shall be made to the Contract Price for increases in the direct cost of performance of the Work of the Contract Documents, actually caused by suspension, delay or interruption ordered by the District provided however that no adjustment of the Contract Price shall be made to the extent: (i) that performance is, was or

would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible under the Contract Documents or (ii) that an equitable adjustment is made or denied under another provision of the Contract Documents. The foregoing notwithstanding, any such adjustment of the Contract Price shall not include any adjustment to increase the Contractor's overhead, general administrative costs or profit, all of which will remain as reflected in the Cost Breakdown submitted by the Contractor pursuant to the Contract Documents. In the event of the District's suspension of the Work, the Contract Time shall be equitably adjusted.

ARTICLE 15: TERMINATION

15.1 Termination for Cause.

15.1.1 District's Right to Terminate. The District may terminate the Contract upon the occurrence of any one or more of the following events of the Contractor's default: (i) if the Contractor refuses or fails to prosecute the Work with diligence as will insure Substantial Completion of the Work within the Contract Time, or if the Contractor fails to substantially Complete the Work within the Contract Time (ii) if the Contractor becomes bankrupt or insolvent, or makes a general assignment for the benefit of creditors, or if the Contractor or a third party files a petition to reorganize or for protection under any bankruptcy or similar laws, or if a trustee or receiver is appointed for the Contractor or for any of the Contractor's property on account of the Contractor's insolvency, and the Contractor or its successor in interest does not provide adequate assurance of future performance in accordance with the Contract Documents within 10 days of receipt of a request for such assurance from the District (iii) if the Contractor repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment (iv) if the Contractor repeatedly fails to make prompt payments to any Subcontractor, of any tier, or Material Suppliers or others for labor, materials or equipment (v) if the Contractor disregards laws, ordinances, rules, codes, regulations, orders applicable to the Work or similar requirements of any public entity having jurisdiction over the Work (vi) if the Contractor disregards proper directives of the Architect, the Project Inspector or District under the Contract Documents (vii) if the Contractor performs Work which deviates from the Contract Documents and neglects or refuses to correct such Work or (viii) if the Contractor otherwise violates in any material way any provisions or requirements of the Contract Documents. Once the District determines that sufficient cause exists to justify the action, the District may terminate the Contract without prejudice to any other right or remedy the District may have, after giving the Contractor and the Surety at least seven (7) days advance written notice of the effective date of termination. The District shall have the sole discretion to permit the Contractor to remedy the cause for the termination without waiving the District's right to terminate the Contract, or otherwise waiving, restricting or limiting any other right or remedy of the District under the Contract Documents or at law.

15.1.2 District's Rights Upon Termination. In the event that the Contract is terminated pursuant to this Article 15.1, the District may take over the Work and prosecute it to completion, by contract or otherwise, and may exclude the Contractor from the site. The District may take possession of the Work and of all of the Contractor's tools, appliances, construction equipment, machinery, materials, and plant which may be on the site of the Work, and use the same to the full extent they could be used by the Contractor without liability to the Contractor. In exercising the District's right to prosecute the completion of the Work, the District may also take possession of all materials and equipment stored at the site of the Work or for which the District has paid the Contractor but which are stored

elsewhere, and finish the Work as the District deems expedient. In exercising the District's right to prosecute the completion of the Work, the District shall have the right to exercise its sole discretion as to the manner, methods, and reasonableness of the costs of completing the Work and the District shall not be required to obtain the lowest figure for completion of the Work. In the event that the District takes bids for remedial Work or completion of the Work, the Contractor shall not be eligible for the award of such contract(s).

15.1.3 Completion by the Surety. In the event that the Contract is terminated pursuant to this Article 15.1, the District may demand that the Surety take over and complete the Work. The District may require that in so doing, the Surety not utilize the Contractor in performing and completing the Work. Upon the failure or refusal of the Surety to take over and begin completion of the Work within twenty (20) days after demand therefor, the District may take over the Work and prosecute it to completion as provided for above.

15.1.4 Assignment and Assumption of Subcontracts. The District shall, in its sole and exclusive discretion, have the option of requiring any Subcontractor or Material Supplier to perform in accordance with its Subcontract or Purchase Order with the Contractor and assign the Subcontract or Purchase Order to the District or such other person or entity selected by the District to complete the Work.

15.1.5 Costs of Completion. In the event of termination under this Article 15.1, the Contractor shall not be entitled to receive any further payment of the Contract Price until the Work is completed. If the unpaid balance of the Contract Price as of the date of termination exceeds the District's direct and indirect costs and expenses for completing the Work, including without limitation, attorneys' fees and compensation for additional professional and consultant services, such excess shall be used to pay the Contractor for the cost of the Work performed prior to the effective date of termination with a reasonable allowance for overhead and profit. If the District's costs and expenses to complete the Work exceed the unpaid Contract Price, the Contractor and/or the Surety shall pay the difference to the District.

15.1.6 Contractor Responsibility for Damages. The Contractor and the Surety shall be liable for all damage sustained by the District resulting from, in any manner, the termination of Contract under this Article 15.1, including without limitation, attorneys' fees, and for all costs necessary for repair and completion of the Work over and beyond the Contract Price.

15.1.7 Conversion to Termination for Convenience. In the event the Contract is terminated under this Article 15.1, and it is determined, for any reason, that the Contractor was not in default under the provisions hereof, the termination shall be deemed a Termination for Convenience of the District and thereupon, the rights and obligations of the District and the Contractor shall be determined in accordance with Article 15.2 hereof.

15.1.8 District's Rights Cumulative. In the event the Contract is terminated pursuant to this Article 15.1, the termination shall not affect or limit any rights or remedies of the District against the Contractor or the Surety. The rights and remedies of the District under this Article 15.1 are in addition to, and not in lieu of, any other rights and remedies provided by law or otherwise under the Contract Documents. Any retention or payment of monies to the Contractor by the District shall not be deemed to release the Contractor or the Surety from any liability hereunder.

15.2 Termination for Convenience of the District. The District may at any time, in its sole and exclusive discretion, by written notice to the Contractor, terminate the Contract in whole or in part when it is in the interest of, or for the convenience of, the District. In such case, the Contractor shall be entitled to payment for: (i) Work actually performed and in place as of the effective date of such termination for convenience of the District, with a reasonable allowance for profit and overhead on such Work, and (ii) reasonable termination expenses for reasonable protection of Work in place and suitable storage and protection of materials and equipment delivered to the site of the Work but not yet incorporated into the Work, provided that such payments exclusive of termination expenses shall not exceed the total Contract Price as reduced by payments previously made to the Contractor and as further reduced by the value of the Work as not yet completed. The Contractor shall not be entitled to profit and overhead on Work which was not performed as of the effective date of the termination for convenience of the District. The District may, in its sole discretion, elect to have subcontracts assigned pursuant to Article 15.1.4 above after exercising the right hereunder to terminate for the District's convenience.

ARTICLE 16: MISCELLANEOUS

16.1 Governing Law. This Contract shall be governed by and interpreted in accordance with the laws of the State of California.

16.2 Marginal Headings; Interpretation. The titles of the various Articles of these General Conditions and elsewhere in the Contract Documents are used for convenience of reference only and are not intended to, and shall in no way, enlarge or diminish the rights or obligations of the District or the Contractor and shall have no effect upon the construction or interpretation of the Contract Documents. The Contract Documents shall be construed as a whole in accordance with their fair meaning and not strictly for or against the District or the Contractor.

16.3 Successors and Assigns. Except as otherwise expressly provided in the Contract Documents, all terms, conditions and covenants of the Contract Documents shall be binding upon, and shall inure to the benefit of the District and the Contractor and their respective heirs, representatives, successors-in-interest and assigns.

16.4 Cumulative Rights and Remedies; No Waiver. Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not in lieu of or otherwise a limitation or restriction of duties, obligations, rights and remedies otherwise imposed or available by law. No action or failure to act by the District shall constitute a waiver of a right or remedy afforded it under the Contract Documents or at law nor shall such an action or failure to act constitute approval of or acquiescence in a breach hereunder, except as may be specifically agreed in writing.

16.5 Severability. In the event any provision of the Contract Documents shall be deemed illegal, invalid, unenforceable and/or void, by a court or any other governmental agency of competent jurisdiction, such provision shall be deemed to be severed and deleted from the Contract Documents, but all remaining provisions hereof, shall in all other respects, continue in full force and effect.

16.6 No Assignment by Contractor. The Contractor shall not sublet or assign the Contract, or any portion thereof, or any monies due thereunder, without the express prior written consent and approval of the District, which approval may be withheld in the sole and exclusive discretion of the District. The District's approval to such assignment shall be upon such terms

and conditions as determined by the District in its sole and exclusive discretion.

16.7 Gender and Number. Whenever the context of the Contract Documents so require, the neuter gender shall include the feminine and masculine, the masculine gender shall include the feminine and neuter, the singular number shall include the plural and the plural number shall include the singular.

16.8 Independent Contractor Status. In performing its obligations under the Contract Documents, the Contractor is an independent contractor to the District and not an agent or employee of the District. Nothing contained herein shall be deemed or construed as creating a relationship of employer and employee between the District and the Contractor or any Subcontractors, employees of the Contractor or Subcontractors or their respective agents and representatives. Neither the Contractor, Subcontractors nor any employees of the Contractor or Subcontractors are entitled to any rights or privileges of District employees.

16.9 Notices. Except as otherwise expressly provided for in the Contract Documents, all notices which the District or the Contractor may be required, or may desire, to serve on the other, shall be effective only if delivered by personal delivery or by postage prepaid, First Class Certified Return Receipt Requested United States Mail, addressed to the District or the Contractor at their respective address set forth in the Contract Documents, or such other address(es) as either the District or the Contractor may designate from time to time by written notice to the other in conformity with the provisions hereof. In the event of personal delivery, such notices shall be deemed effective upon delivery, provided that such personal delivery requires a signed receipt by the recipient acknowledging delivery of the same. In the event of mailed notices, such notice shall be deemed effective on the third working day after deposit in the mail.

16.10 Disputes; Continuation of Work. Notwithstanding any claim, dispute or other disagreement between the District and the Contractor regarding performance under the Contract Documents, the scope of Work thereunder, or any other matter arising out of or related to, in any manner, the Contract Documents, the Contractor shall proceed diligently with performance of the Work in accordance with the District's written direction, pending any final determination or decision regarding any such claim, dispute or disagreement.

16.11 Dispute Resolution; Arbitration.

16.11.1 Claims Under \$375,000.00. Claims between the District and the Contractor of 375,000.00 or less shall be resolved in accordance with the procedures established in Part 3, Chapter 1, Article 1.5 of the California Public Contract Code, §20104 et seq. provided however that California Public Contract Code §20104.2(a) shall not supersede the requirements of the Contract Documents with respect to the Contractor's notification to the District of such claim or extend the time for the giving of such notice as provided in the Contract Documents. The term "claims" as used herein shall be as defined in California Public Contract Code §20104(b) (2).

16.11.2 Government Code Claim Requirements. Pursuant to Government Code §930.6, any claim, demand, dispute, disagreement or other matter in controversy asserted by the Contractor against the District for money or damages, including, without limitation, a demand for arbitration, except for those subject to resolution pursuant to Article 16.11.1, shall be deemed a "suit for money or damages" and shall be subject to the provisions of Government Code §§945.4, 945.6 and 946. Notwithstanding the resolution of disputes

pursuant to the arbitration provisions set forth in Article 16.11.3 any claim, demand, dispute, disagreement or other matter in controversy between the Contractor and the District seeking money or damages in excess of 375,000 shall first be presented to the District and acted upon or deemed rejected by the District in accordance with California Government Code section 900, et seq., as a condition precedent to the Contractor's commencement of arbitration proceedings. Any arbitration proceeding pursuant to Article 16.11.3 commenced by the Contractor without first complying with the foregoing provisions of the Government Code shall be stayed pending the Contractor's compliance with the foregoing provisions of the Government Code.

16.11.3 Arbitration. Except as provided in Article 16.11.1, any other claims, disputes, disagreements or other matters in controversy between the District and the Contractor arising out of, or related, in any manner, to the Contract Documents, or the interpretation, clarification or enforcement thereof shall be resolved by arbitration conducted in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association ("AAA") in effect as of the date that a Demand for Arbitration is filed, except as expressly modified herein. The locale for any arbitration commenced hereunder shall be the regional office of the AAA closest to the Site. The award rendered by the Arbitrator(s) ("Arbitration Award") shall be final and binding upon the District and the Contractor only if the Arbitration Award is supported by law and substantial evidence pursuant to California Code of Civil Procedure §1296, including findings of fact and conclusions of law in conformity with California Code of Civil Procedure §1296 and Rule R-43 of the AAA Construction Industry Arbitration Rules. The District and Contractor hereby expressly agree that the Court shall, subject to California Code of Civil Procedure §§1286.4 and 1296, vacate the Arbitration Award if, after review of the Arbitration Award, the Court determines either that the Arbitration Award is: (i) not supported by substantial evidence (ii) not accompanied by findings of fact and conclusions of law or (iii) based on an error of law. In connection with any arbitration proceeding commenced hereunder, the discovery rights and procedures provided for in California Code of Civil Procedure §1283.05 shall be applicable, and the same shall be deemed incorporated herein by this reference. A Demand for Arbitration shall be filed and served within a reasonable time after the occurrence of the claim, dispute or other disagreement giving rise to the Demand for Arbitration, but in no event shall a Demand for Arbitration be filed or served after the date when the institution of legal or equitable proceedings based upon such claim, dispute or other disagreement would be barred by the applicable statute of limitations. In the event more than one Demand for Arbitration is made by either the District or the Contractor, all such controversies shall be consolidated into a single arbitration proceeding, unless otherwise agreed to by the District and the Contractor. The Contractor's Surety, a Subcontractor or Material Supplier to the Contractor and other third parties may be permitted to join in and be bound by an arbitration commenced hereunder if required by the terms of their respective agreements with the Contractor, except to the extent that such joinder would unduly delay or complicate the expeditious resolution of the claim, dispute or other disagreement between the District and the Contractor, in which case an appropriate severance order shall be issued by the Arbitrator(s). The expenses and fees of the Arbitrator(s) shall be divided equally among the parties to the arbitration. Each party to any arbitration commenced hereunder shall be responsible for and shall bear its own attorneys' fees, witness fees and other cost and expense incurred in connection with such arbitration. The foregoing notwithstanding, the Arbitrator(s) may award arbitration costs, including Arbitrators' fees but excluding attorneys' fees, to the prevailing party. The confirmation, enforcement, vacation or correction of an arbitration award rendered hereunder shall be the Superior Court of the State of California for the county in which the

Site is situated. The substantive and procedural rules for such post-award proceedings shall be as set forth in California Code of Civil Procedure §1285 et seq.

- 16.11.4 Inapplicability to Bid Bond.** The provisions of this Article 16.11 shall not be applicable to disputes, disagreements or enforcement of rights or obligations under the Bid Bond all claims, disputes and actions to enforce rights or obligations under the Bid Bond shall be adjudicated only by judicial proceedings commenced in a court of competent jurisdiction.
- 16.12 Capitalized Terms.** Except as otherwise expressly provided, capitalized terms used in the Contract Documents shall have the meaning and definition for such term as set forth in the Contract Documents.
- 16.13 Attorneys Fees.** Except as expressly provided for in the Contract Documents, or authorized by law, neither the District nor the Contractor shall recover from the other any attorneys fees or other costs associated with or arising out of any legal, administrative or other proceedings filed or instituted in connection with or arising out of the Contract Documents or the performance of either the District or the Contractor thereunder.
- 16.14 Waiver of Special/Consequential Damages.** Notwithstanding any right conferred by law or arising by operation of law, by executing the Agreement, the Contractor expressly waives and relinquishes any and all right or entitlement to assert or recover any damages, losses or liabilities from the District which are in the nature of special or consequential damages, losses or liabilities arising out of or related in any manner to the District's breach or default of its obligations under the Contract Documents.
- 16.15 Provisions Required by Law Deemed Inserted.** Each and every provision of law and clause required by law to be inserted in the Contract Documents is deemed to be inserted herein and the Contract Documents shall be read and enforced as though such provision or clause are included herein, and if through mistake, or otherwise, any such provision or clause is not inserted or if not correctly inserted, then upon application of either party, the Contract Documents shall forthwith be physically amended to make such insertion or correction.
- 16.16 Days.** Unless otherwise expressly stated, references to "days" in the Contract Documents shall be deemed to be calendar days.
- 16.17 Prohibited Interests.** No employee of the District, who is authorized in such capacity on behalf of the District to negotiate, make, accept or approve, or to take part in negotiating, making, accepting or approving any architectural, engineering, inspection, construction or material supply contract or subcontract in connection with the Work shall become directly or indirectly financially interested in the Work or any part thereof.
- 16.18 Entire Agreement.** The Contract Documents contain the entire agreement and understanding between the District and the Contractor concerning the subject matter hereof, and supersedes and replaces all prior negotiations, proposed agreements or amendments, whether written or oral. No amendment or modification to any provision of the Contract Documents shall be effective or enforceable except by an agreement in writing executed by the District and the Contractor.

END OF SECTION

THIS PAGE INTENTIONALLY BLANK

SPECIAL CONDITIONS

Application of Special Conditions. These Special Conditions are a part of the Contract Documents for the Work generally described as: **BID NO.: XXXXX Name of Project Here Name of College**

Drawings and Specifications The number of sets of the Drawings and Specifications which the District will provide the Contractor, pursuant to Article 2.1.3 of the General Conditions will be mutually agreed upon and reasonable at the District’s discretion and will not exceed 3 sets.

1. Insurance

1.1 Insurance Requirements for Contractor Minimum coverage amounts for each policy of insurance required of the Contractor shall be as follows:

Workers Compensation Insurance	In accordance with applicable law
Employers Liability Insurance	1,000,000
Commercial General Liability Insurance (including coverage for bodily injury, death, property damage and motor vehicle liability)	
Per Occurrence	2,000,000
Aggregate	4,000,000
 Builder’s Risk	 Full value of the Work seismic coverage is not required

1.2 Insurance Requirements for Subcontractors Minimum coverage amounts for each policy of insurance to be obtained and maintained by each Subcontractor to the Contractor shall be as follows:

Workers Compensation Insurance	In accordance with applicable law
Employers Liability Insurance	1,000,000
Commercial General Liability Insurance (including coverage for bodily injury, death, property damage and motor vehicle liability)	
Per Occurrence	1,000,000
Aggregate	2,000,000

2. Contract Time, Liquidated Damages

2.1 Contract Time The Contract Time for the Contractor’s Substantial Completion of the Work is **NUMBER OF DAYS HERE Calendar days** after the date for commencement of the Work as set forth in the Notice to Proceed issued by or on behalf of the District to the Contractor. The anticipated Notice to Proceed date of DATE HERE.

2.1.1 Pre-Construction Conference: A pre-construction conference with the Unions and with representatives of all involved Contractors/Employers, who shall be prepared to announce craft assignments and to discuss in detail the scope of work and the other issues set forth below, at least twenty-one (21) calendar days prior to: (a) The commencement of any Project work, and (b) The

commencement of Project work on each subsequently awarded Construction Contract, as set forth in the Project Labor Agreement.

- 2.1.2** Contractor's bid is to include all necessary PPE containments and environmental controls needed to perform scope of work in compliance with State, County, City, and CLPCCD Mandates. Masks are required at all times while on District Property.

2.2 Liquidated Damages

- 2.2.1** Delayed Submission of Preliminary Construction Schedule: If the Contractor fails to submit the Contractor's Preliminary Construction Schedule within the time established in the General Conditions, the Contractor shall be subject to assessment of Liquidated Damages in the amount of **One Thousand Dollars (\$1,000.00)** per day from the date the Preliminary Construction Schedule is required to be submitted until submission thereof to the District.
- 2.2.2** Delayed Substantial Completion: If the Contractor fails to achieve Substantial Completion of the Work within the Contract Time, including adjustments thereto in accordance with the Contract Documents, the Contractor shall be subject to assessment of Liquidated Damages in the amount of **One Thousand Five Hundred Dollars (\$1,500.00)** per day from the scheduled date of Substantial Completion until Substantial Completion is achieved.
- 2.2.3** Delayed Task Substantial Completion: If the Contractor fails to achieve Substantial Completion of the Work within the Contract Time, including adjustments thereto in accordance with the Contract Documents, the Contractor shall be subject to assessment of Liquidated Damages in the amount of **One Thousand Five Hundred Dollars (\$1,500.00)** per day from the scheduled date of Substantial Completion until Substantial Completion is achieved.
- 2.2.4** Delayed Completion of Punchlist Items: If the Contractor fails to complete all Punchlist Items noted upon Substantial Completion within the time established for completion of all Punchlist Items, the Contractor shall be subject to assessment of Liquidated Damages in the amount of **One Thousand Dollars (\$1,000.00)** per day from the scheduled date of completion until all Punchlist Items are completed.
- 2.2.5** District Withhold of Liquidated Damages Performance Bond Surety: If the Contractor is subject to assessment of Liquidated Damages for delayed Substantial Completion and/or delay completion of Punchlist Items, the District may withhold such assessments from the Contract Price then or thereafter due the Contractor. If the assessment of Liquidated Damages exceeds the then remaining balance of the Contract Price, the Contractor and the Surety issuing the Performance Bond shall be jointly and severally liable to the District for such amounts.

- 2.3** Delays due to Unanticipated, Unusually Severe Weather Conditions: Delays due to adverse weather conditions will only be granted to the extent they exceed the "normal" anticipated Inclement Weather Days set forth herein. A weather delay day shall be granted for each calendar day the Contractor can document adverse weather caused

critical path delays in excess of 34 calendar days. This is the number to be used in the schedules under the activity entitled “Remaining Inclement Weather Days”. See General Conditions Paragraph 7.3.9 for further information and notice requirements documenting “Inclement Weather Days”.

Weather Days Per Month					
January:	6	May:	1	September:	0
February:	6	June:	1	October:	1
March:	6	July:	0	November:	4
April:	3	August:	0	December:	6

2.4 Notice of Delay: The Contractor shall notify the Construction Manager, in writing, of all delays Pursuant to Articles 7 and 9 of the General Conditions.

3. **District Provided Temporary Utilities** Pursuant to Article 4.3.4 of the General Conditions, during the Contractor’s performance of the Work, the District will provide utility services and a point of connection for electrical power and domestic potable water. The connection and placement, relocation and removal of temporary distributions of the electrical power and domestic potable water utility service provided by the District will be by the Contractor at its cost and expense without adjustment of the Contract Price. The Contractor may use the temporary electrical power and domestic potable water service furnished by the District provided that: (a) the District may discontinue, limit or condition use of such services by a Contractor if the District reasonably determines that the Contractor has wasted such utilities, and (b) the District shall not be liable to the Contractor, nor shall the Contract Time or the Contract Price be increased if any District provided temporary utility service is discontinued or disrupted for any reason other than the District’s non-payment of undisputed utility charges.

4. **Project Inspector Field Office** Contractor to provide a field office at least 10 ft. x 10ft., insulated, weathertight, air-conditioned for the Inspector of Record. The trailer is to be equipped with security bars on all exterior windows and doors. Provide three (3) sets of keys for each door. Contractor to provide and install exterior lights on the trailer. The contractor shall furnish the Project Inspector’s office with: operable window shades, one (1) office desk, one (1) ergonomic chair, two (2) guest chairs, one (1) four-drawer metal file cabinet, one (1) plan table, one (1) bookcase, one (1) dry-erase whiteboard, water cooler/drinking water dispenser, color multi-function copy/printer/scan machine accommodating letter, legal and ledger-size paper with wireless capabilities, first aid kit and fire extinguisher. The contractor shall pay all costs associated with copies and supplies to the color multi-function printer. The contractor to provide high-speed internet service, modem, and four-port wireless router for networking hardware/software for use during construction for the Project Inspector trailer. Contractor shall provide weekly professional cleaning service for the trailer.

5. **Mark-Ups on Changes to the Work** In the event of Changes to the Work, pursuant to Article 9 of the General Conditions, the mark-up for all overhead (including home and field office overhead), general conditions costs and profit, shall not exceed the percentage of allowable direct actual costs for performance of the Change as set forth below. For the portion of any Change performed by Subcontractors of any tier, the percentage mark-up on allowable actual direct labor and materials costs incurred by all Subcontractors of any tier shall be Twelve Percent (12 %). In addition, for the portion of any Change performed by a Subcontractor of any tier, the Contractor may add an amount equal to Five Percent (5 %) of the allowable actual direct labor and materials costs of Subcontractors performing the Change. For the portion of any Change performed by the Contractor’s own forces, the mark-up on the allowable actual direct labor and

materials costs of such portion of a Change shall be Fifteen Percent (15 %).

6. **Form and Content of Change Orders** In accordance with the provisions of Article 9.5 of the General Conditions, if the District approves of a Change Order, the Change Order issued by the District and executed by the District, Architect, Construction Manager and Contractor shall be in the form and content as set forth in Attachment A to these Special Conditions.
7. **Asbestos and Other Hazardous Materials Certification** Upon completion of the Work and as an additional express condition precedent to the District's obligation to disburse the Final Payment to the Contractor, the Contractor's duly authorized representative shall deliver to the District the completed and executed form of Asbestos and Other Hazardous Materials Certification included as Attachment B to the Special Conditions the signature of the Contractor's representative shall be notarized by a California Notary Public.
8. **Debris Recycling Statement** The District's form of Debris Recycling Statement is attached to these Special Conditions as Attachment C. The Contractor shall complete, execute and submit the Debris Recycling Statement in accordance with applicable provisions of the Contract Documents, under General Conditions, Supervision and Construction Procedures, Section 4.3.9.
9. **Public Works Contractor Registration Certificate.** The District's form of Public Works Contractor Registration Certification form is attached to these Special Conditions as Attachment D. The Contractor and its Sub-Contractors shall complete, execute and submit the Public Works Contractor Registration Certification form with the Bid Proposal in accordance with the Bid Documents.
10. **Additional Definitions** In addition to terms defined elsewhere in the Contract Documents, the following terms used in the Contract Documents are defined as set forth herein.
 - 10.1 **Owner** Unless otherwise expressly provided, references to the "Owner" shall be deemed references to the District, as that term is defined in the Contract Documents.
 - 10.2 **Inspector; Inspector of Record; IOR; Owner's Inspector** Unless otherwise expressly provided, references to Inspector, Inspector of Record, IOR or Owner's Inspector shall be deemed references to the Project Inspector as that term is defined in the Contract Documents.
 - 10.3 **Contract Sum** Unless otherwise expressly provided, the terms "Contract Price" and "Contract Sum" are synonymous.
 - 10.4 **Campus** Unless otherwise expressly provided, the term "Campus" shall be deemed to refer to the District's Chabot College campus.
 - 10.5 **Rain Days**. Pursuant to Article 7.3.9 of the General Conditions, the rain days included within the contract period shall be thirty-four (34) calendar days.

**CHANGE ORDER FORM
(ATTACHMENT A TO SPECIAL CONDITIONS)**

Project: _____ Change Order #: _____
Date: _____

Contractor: _____

Pursuant to the General Conditions, this Change Order Form shall be used for all Change Orders associated with the Work. No additions or deletions to this form shall be allowed, except with permission of the District.

You are hereby directed to provide the extra work necessary to comply with this Change Order.

DESCRIPTION OF CHANGE:

Contractor accepts the terms and conditions stated as full and final settlement of any and all claims arising from this Change Order. Contractor agrees to perform the above described changes in accordance with the terms set forth herein and in compliance with applicable sections of the Contract Documents. This Change Order is hereby agreed to, accepted and approved, all in accordance with the General Conditions of the Contract Documents. The adjustment of the Contract Price and the Contract Time for the changes noted in this Change Order (the "Changes") represents the full and complete adjustment of the Contract Time and the Contract Price due the Contractor for providing and completing such Changes, including without limitation: (i) all costs (whether direct or indirect) for labor, equipment, materials, tools, supplies and/or services (ii) all general and administrative overhead costs (including without limitation, home office, field office and Site general conditions costs) and profit and (iii) all impacts, delays, disruptions, interferences, or hindrances in providing and completing the Changes. Contractor waives all rights, including without limitation those arising under Civil Code Section 1542, for any other adjustment of the Contract Price or the Contract Time on account of the Changes set forth in this Change Order or the Contractor's performance and completion of the Changes.

NOT VALID UNTIL SIGNED BY THE OWNER, ARCHITECT, AND CONTRACTOR

The original Contract Sum was _____

Net change by previously authorized Change Orders _____

The Contract Sum prior to this Change Order was. _____

The Contract Sum will be changed by this Change Order in the amount of. _____

The adjusted Contract Sum including this Change Order will be. _____

The Contract Time will be (increased) (decreased) (unchanged) by. (_____) Days

The Contractual date of Substantial Completion as of the date of this Change Order therefore is: . . . ____/____/____

ARCHITECT CONTRACTOR CONSTRUCTION MANAGER PROJECT PLANNER, MANAGER

By: _____ By: _____ By: _____ By: _____

Date: _____ Date: _____ Date: _____ Date: _____

Vice Chancellor Fac/Bond OWNER
CHABOT-LAS POSITAS COMMUNITY COLLEGE DISTRICT
7600 Dublin Blvd., 3rd Floor, Dublin, CA 94568

By: _____ By: _____

Date: _____ Date: _____

**ASBESTOS AND OTHER HAZARDOUS MATERIALS CERTIFICATION
(ATTACHMENT B TO SPECIAL CONDITIONS)**

This Asbestos and Other Hazardous Materials Certification form is part of the Contract made by and between the CHABOT-LAS POSITAS COMMUNITY COLLEGE DISTRICT and **BID NO.: XXXXX** **Name of Project Here Name of College** (hereinafter referred to as the "Project").

To the best of my knowledge, information and belief, in completing the Work of the Project, no materials, equipment or other items furnished, installed or incorporated into the Project contains, or in itself be composed of, any asbestos, polychlorinated biphenyl (PCB), any material listed by the federal or state EPA or federal or state health agencies as a hazardous material, or defined as being hazardous under federal or state laws, rules or regulations.

The undersigned is duly authorized to complete, execute and submit this Asbestos and Other Hazardous Materials Certification on behalf of the Contractor. The undersigned has personal knowledge of the substantive representations set forth hereinabove or has made appropriate diligent inquiry to ascertain that the substantive representations set forth hereinabove are complete, true and accurate and do not omit material facts rendering such representations to be false or misleading.

_____ ("Contractor") for the work of improvement commonly referred to as I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on this _____ day of _____, 2021 at _____.
(City and State)

Name of Contractor (Print or Type)

By: _____
Signature

Print Name

Title

Subscribed and sworn before me
this ____ day of _____, 2021

Notary Public in and for the State of California

My Commission Expires:

THIS PAGE INTENTIONALLY BLANK

Chabot – Las Positas Community College District
Construction & Demolition
DEBRIS RECYCLING STATEMENT
(Attachment C to Special Conditions)

Project Name / Location: _____			
_____ Demolition		_____ Construction	
Contractor Name: _____			
Contact Name: _____		Phone: _____	Fax: _____
Anticipated Start Date: _____		Anticipated Completion Date: _____	
Statement Date: _____			
For the period between: _____ / _____ and _____ / _____			
Month	Year	Month	Year

Please indicate estimated quantities by matter, the proposed processing method and the vendor selected. Weight tag required as verification.

	Estimated Amount (Tons or Yards)			
	Recycled	Salvaged	Landfilled	
Asphalt				
Concrete				
Brick/Masonry Tile				
Corrugated Cardboard				
Dirt/Clean Full				
Drywall				
Padding – Carpet Foam				
Building Materials (doors, windows, cabinets, fixtures)				
Scrap Metals				
Mixed Recyclable Debris				
Other				
Un-painted wood/Pallets				
Green Waste/Yard Waste				
Garbage – Painted Wood-Trash				

If no materials are targeted for recycling, reuse or salvage, please state why: _____

The undersigned certifies that she/he is authorized to execute this Debris Recycling Statement on behalf of the above-identified Contractor. The undersigned further certifies that she/he has personal knowledge of the foregoing, or has made reasonable inquiry to ascertain, that the foregoing is true, complete and correct.

Submitted by: _____ Date: _____

THIS PAGE INTENTIONALLY BLANK

PUBLIC WORKS CONTRACTOR REGISTRATION CERTIFICATION
(Attachment D to Special Conditions)

I, _____, am the _____ of
(Print Name) (Title)

(Contractor Name)

I declare, state and certify to all of the following:

1. I am aware of the provisions and requirements of California Senate Bill (SB) 854, the Public Works Contractor Registration Program.
2. I am authorized to certify, and do certify, on behalf of Contractor that an annual registration fee has been paid and I am registered as eligible to bid and work on public works projects by doing all of the following:
 - A. Must have workers' compensation coverage for any employees and only use subcontractors who are glistered public works contractors
 - B. Must have Contractors State License Board license, if applicable to trade
 - C. Must have no delinquent unpaid wage or penalty assessments owed to any employee or enforcement agency
 - D. Must not be under federal or state debarment
 - E. Must not be in prior violation of this registration requirement once it becomes effective on April 1, 2015.
3. Contractor and I understand that if the District determines that Contractor has either: (a) made a false certification herein, or (b) violated this certification by failing to carry out and to implement the requirements of the Department of Industrial Relations (DIR), the Contract awarded herein is subject to termination, suspension of payments, or both. Contractor and I further understand that, should Contractor violate the terms of the Public Works Contractor Registration Certification Law of California Senate Bill 854, Contractor may be subject to debarment in accordance with the provisions of California Labor Code 1720, et seq.
4. Contractor and I acknowledge that Contractor and I are aware of the provisions of California Senate Bill 854 and hereby certify that Contractor and I will adhere to, fulfill, satisfy and discharge all provisions of and obligations under the Public Works Contractor Registration Program.

I declare under penalty of perjury under the laws of the State of California that all of the foregoing is true and correct.

Executed at _____ this _____ day of
(City and State)

_____, 2021

(Signature)

(Handwritten or Typed Name)

Department of Industrial Relations Registration #

THIS PAGE INTENTIONALLY BLANK

Escrow Agreement for Security Deposits in Lieu of Retention
P.C.C. §22300

THIS ESCROW AGREEMENT ("Escrow Agreement") is made and entered into this ____ day of _____, 202_, by and between the CHABOT LAS POSITAS COMMUNITY COLLEGE DISTRICT (hereinafter called the "District"), whose address is 7600 Dublin Boulevard, Dublin, California 95554; _____ ("Contractor"), whose place of business is located at _____ and [District, as escrow agent ...OR... _____], a state or federally chartered bank in the State of California, whose place of business is located at _____ ("Escrow Agent").

For the consideration hereinafter set forth, District, Contractor and Escrow Agent agree as follows:

1. Pursuant to Section 22300 of Public Contract Code of the State of California, Contractor has the option to deposit securities with Escrow Agent as a substitute for retention earnings required to be withheld by District pursuant to Contract Number ____ entered into between District and Contractor for District-wide Emergency Call Station Project in the amount of [_____] dated [_____] (the "Contract"). Alternatively, on written request of Contractor, District shall make payments of the retention earnings directly to Escrow Agent. When Contractor deposits the securities as a substitute for Contract earnings, Escrow Agent shall notify District within ten (10) Days of the deposit. The market value of the securities at the time of substitution shall be at least equal to the cash amount then required to be withheld as retention under terms of Contract between District and Contractor. Securities shall be held in name of _____, and shall designate Contractor as the beneficial owner.
2. District shall make progress payments to Contractor for those funds which otherwise would be withheld from progress payments pursuant to Contract provisions, provided that Escrow Agent holds securities in form and amount specified in paragraph 1 of this Section 00680.
3. When District makes payment(s) of retention earned directly to Escrow Agent, Escrow Agent shall hold said payment(s) for the benefit of Contractor until the time that the escrow created under this Escrow Agreement is terminated. Contractor may direct the investment of the payments into securities. All terms and conditions of this Escrow Agreement and the rights and responsibilities of the parties shall be equally applicable and binding when District pays Escrow Agent directly.
4. Contractor shall be responsible for paying all fees for the expenses incurred by Escrow Agent in administering the Escrow Account, and all expenses of District. Such expenses and payment terms shall be determined by District, Contractor, and Escrow Agent.
5. Interest earned on securities or money market accounts held in escrow and all interest earned on that interest shall be for sole account of Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to District.
6. Contractor shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to Escrow Agent accompanied by written authorization from District to Escrow Agent that District consents to withdrawal of amount sought to be withdrawn by Contractor.
7. District shall have the right to draw upon the securities in event of default by Contractor. Upon

seven (7) Days written notice to Escrow Agent from District of the default, Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by District.

- 8. Upon receipt of written notification from District certifying that the Contract is final and complete, and that Contractor has complied with all requirements and procedures applicable to the Contract, Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all moneys and securities on deposit and payments of fees and charges.
- 9. Escrow Agent shall rely on written notifications from District and Contractor pursuant to paragraphs 5 through 8, inclusive, of this Section 00680 and District and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of securities and interest as set forth.
- 10. Names of persons who are authorized to give written notice or to receive written notice on behalf of District and on behalf of Contractor in connection with the foregoing, and exemplars of their respective signatures are as follows:

On behalf of Escrow Agent:

Title

Name

Signature

Address

City/State/ ip

At the time the Escrow Account is opened, District and Contractor shall deliver to Escrow Agent a fully executed counterpart of this Agreement.

IN WITNESS WHEREOF, the parties have executed this Escrow Agreement by their proper officers on the date first set forth above.

District:

Contractor:

Vice Chancellor _____

Title

Title

Name

Name

Signature

Signature

7600 Dublin Boulevard

Address

Address

Dublin, California 95554

City/State/ ip

City/State/ ip

Escrow Agent:

Title

Name

Signature

Address

City/State/ ip

END OF SECTION

THIS PAGE INTENTIONALLY BLANK

GUARANTEE

District: CHABOT-LAS POSITAS COMMUNITY COLLEGE DISTRICT
Project: BID NO.: XXXXX Name of Project Here Name of College

Contractor Name: _____

The Contractor hereby warrants and guarantees to the District that all work, materials, equipment and workmanship provided, furnished or installed by or on behalf of Contractor in connection with the above-referenced Project (the "Work") have been provided, furnished and installed in strict conformity with the Contract Documents for the Work, including without limitation, the Drawings and the Specifications. Contractor further warrants and guarantees that all work, materials, equipment and workmanship as provided, furnished and/or installed are fit for use as specified and fulfill all applicable requirements of the Contract Documents including without limitation, the Drawings and the Specifications. Contractor shall, at its sole cost and expense, repair, correct and/or replace any or all of the work, materials, equipment and/or workmanship of the Work, together with any other items which may be affected by any such repairs, corrections or replacement, that may be unfit for use as specified or defective within a period of one (1) year from the date of the District's Final Acceptance of the Work, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of the Contractor's failure and/or refusal to comply with the provisions of this Guarantee, within the period of time set forth in the Contract Documents after the District's issuance of the Notice to the Contractor of any defect(s) in the Work, materials, equipment or workmanship, Contractor authorizes the District, without further notice to Contractor, to repair, correct and/or replace any such defective item at the expense of the Contractor. The Contractor shall reimburse the District for all costs, expenses or fees incurred by the District in providing or performing such repairs, corrections or replacements within ten (10) days of the District's presentation of a demand to the Contractor for the same.

The provisions of this Guarantee and the provisions of the Contract Documents for the Work relating to the Contractor's Guarantee(s) and warranty(ies) relating to the Work shall be binding upon the Contractor's Performance Bond Surety and all successors or assigns of Contractor and/or Contractor's Performance Bond Surety.

The provisions of this Guarantee are in addition to, and not in lieu of, any provisions of the Contract Documents for the Work relating to the Contractor's guarantee(s) and warranty(ies) or any guarantee(s) or warranty(ies) provided by any material supplier or manufacturer of any equipment, materials or other items forming a part of, or incorporated into the Work, or any other guarantee or warranty obligation of the Contractor, prescribed, implied or imposed by law.

The undersigned individual executing this Guarantee on behalf of Contractor warrants and represents that he/she is duly authorized to execute this Guarantee on behalf of Contractor and to bind Contractor to each and every provision hereof.

Dated: _____

By: _____
(Signature)

(Typewritten or handwritten name)

(Title)

THIS PAGE INTENTIONALLY BLANK



Chabot-Las Positas Community College District

Measure A Bond Program

CONTRACT REQUIREMENTS

DIVISION 1 GENERAL REQUIREMENTS

PART 1 – GENERAL

1.01 SUMMARY

- A. This section includes summary of work including:
 - 1. Work covered by Contract Documents
 - 2. Bid items, Allowances and Alternates
 - 3. Work under other contracts
 - 4. Future work
 - 5. Work sequence
 - 6. Cooperation of contractor and coordination with other work
 - 7. Maintenance
 - 8. Occupancy requirements
 - 9. Reference Standards
 - 10. Products ordered in advance
 - 11. CLPCCD furnished products

1.02 WORK COVERED BY CONTRACT DOCUMENTS

- A. SCOPE OF WORK: Insert description of the work included in the project in this paragraph!
- B. The work shall include all work shown and specified except for work indicated “N.I.C” or “Not in Contract”.
- C. TIME OF WORK: Insert requirements for the time of work to be completed in accordance with building occupancy, CEQA documents, and local noise ordinance as applicable. If building is occupied during instructional hours provide instructional hours and academic calendar for the duration of the project to provide contractor with holidays, flex days and other non-instructional days. Provide notification of mid-term exams and finals week when work may not be performed based upon interruption of the instructional times.
- D. The Contractor must maintain access to the existing buildings at all times during the project. The contractor is to provide secure fencing and/or barricades to keep the general public from entering exterior work areas and contractor laydown areas. Fencing is required to have a privacy screen.
- E. Unless provided otherwise in the Contract Documents, all risk of loss of Work covered by the Contract Documents shall rest with the Contractor until Final Completion and Acceptance of the Work.

1.03 BID ITEMS

- A. Base Bid- Furnish and install all work shown on Drawings and described in Specifications and all other Contract Documents, including connections to existing systems for a complete and operation product.
- B. Allowance- An Owner’s unspecified allowance is as noted in Paragraph 1.1 of the Bid Proposal.

1.04 WORK UNDER OTHER CONTRACTS

If applicable list other contracted work that will take place in the area of work during the contract time period.

SUMMARY OF WORK

SECTION 01 11 00

1.05 FUTURE WORK

Not Applicable.

1.06 WORK SEQUENCE

- A. The contractor shall coordinate their work with the Construction Manager. Work will be performed on an active college campus. Campus buildings are generally in use from 7:30AM to 10:30PM Monday through Friday and 7:30AM to 5:30Pm on Saturday. Contractor shall provide to the Construction Manager a sequence of work and regular updates as agreed upon in the pre-construction meeting.

1.07 COOPERATION OF CONTRACTOR AND COORDINATION WITH OTHER WORK.

- A. Should construction work, or work of any other nature, be underway by District or other forces or by other contractors within or adjacent to the limits of the Work at the time the Work was advertised for bids, the Contractor shall cooperate with all such other contractors or forces to the end that any delay or hindrance to their work will be avoided. The cost of such cooperation will be considered as included in the prices bid and no direct or additional payment will be made therefore. Contractor shall coordinate with such other contractors and forces as required by General Conditions.
- B. CLPCCD reserves the right to perform other or additional work, within or adjacent to the limits of the work specified, at any time by the use of other forces. Contractor shall coordinate with CLPCCD and any CLPCCD forces, or other forces, engaged by CLPCCD, as required by General Conditions. In the event that the performance of such other or additional work materially increases or decreases Contractor's costs, the work and the amount to be paid therefore will be appropriately adjusted as determined by the Construction Manager.
- C. Limit use of the Site for Work and for construction operations to allow for:
 - a. CLPCCD operation
 - b. Work by other contractors and tenants
- D. Coordinate use of the Site and access to site with other contractors, utilities, and CLPCCD forces, as required by General Conditions. Construction Manager has final authority over coordination, use of the Site, and access to site.
- E. Cooperate with CLPCCD and others who may occupy and begin work on site and inside building prior to completion of Work of this Contract.
- F. Cooperate with contractors for other area work, not included in Contract, but which may take place during construction period.

1.08 MAINTENANCE

- A. Cost of maintenance of systems and equipment prior to Final Acceptance will be considered as included in prices bid and no direct or additional payment will be made therefore.

1.09 OCCUPANCY REQUIREMENTS

- A. Whenever, in the opinion of Construction Manager, Work or any part thereof is in a condition suitable for use, and the best interest of CLPCCD requires such use, CLPCCD may take beneficial occupancy of and connect to, open for public use, or use the Work or such part thereof. In such case, CLPCCD will request Architect/Engineer to inspect the Work or part thereof, and issue a Certificate of Substantial Completion for that part of Work.
- B. Prior to date of Final Acceptance of the Work by CLPCCD, all necessary repairs or renewals in Work or part thereof so used, due to ordinary wear and tear, or due to defective materials or

SUMMARY OF WORK

SECTION 01 11 00

workmanship or to operations of Contractor, shall be made at expense of Contractor, as required in General Conditions.

- C. Use by CLPCCD of Work or part thereof as contemplated by this section shall in no case be construed as constituting acceptance of Work or any part thereof. Such use shall neither relieve Contractor of any responsibilities under Contract, nor act as waiver by CLPCCD of any of the conditions thereof.
- D. CLPCCD may specify in the Contract Documents that portions of the Work, including electrical and mechanical systems or separate structures, shall be substantially completed on milestone dates prior to substantial completion of all of the Work. Contractor shall notify Architect/Engineer in writing when Contractor considers any such part of the Work ready for its intended use and substantially complete and request Architect/Engineer to issue a Certificate of Substantial Completion for that part of the Work.

PART 2 – PRODUCTS

2.01 REFERENCE STANDARDS

- A. For products specified by association or trade standards, comply with requirements of standard, except where more rigid requirements are specified or are required by applicable codes.

2.02 PRODUCTS ORDERED IN ADVANCE

If products are ordered by the District or Contractor in advance provide list or products, model and date or order here. If none are provide include “Not Applicable”.

2.03 CLPCCD FURNISHED PRODUCTS

For CLPCCD furnished products as specified, if any, shall be indicated on Construction Documents.

PART 3 – EXECUTION

Not applicable.

END OF SECTION

PART 1 – GENERAL

1.01 SUMMARY

- A. This section describes general procedural requirements for alterations, modifications and extras.
- B. Related Sections
 - 1. Section 01 11 00: Summary of Work

1.02 GENERAL

- A. Any change in scope of work or deviation from Drawings or Specifications shall be accomplished only when authorized in writing by Construction Manager in accordance with General Conditions Article 9. As appropriate, change orders are subject to approval by the Division of the State Architect. Refer to section 4-338, Part 1, Title 24, California Code of Regulations, and the CLPCCD Board of Trustees as appropriate.
- B. Changes in the scope of Work or deviation from Drawings or Specification may not be initiated by use of the following methods:
 - 1. Request for Information (RFI): Request for information shall be in accordance with General Conditions Paragraph 3.1.10. If a change in scope or cost is required by the Architect/Engineer response to the RFI the contractor shall submit a change order request per Article 9 of the General Conditions
 - 2. Request for Substitution (RFS) Request for alternates or substitutes shall be in accordance with General Conditions Paragraph 4.8.2.
- C. Changes in scope of Work or deviation from Drawings or Specifications may be initiated only by the Contractor or the Construction Manager.
 - 1. Contractor may initiate changes by submitting : Change Order Request; Notice of Concealed or Unknown Conditions, or Notice of Hazardous Waste Conditions.
 - a. Notices of Changes shall be submitted in accordance with paragraph 9.6 of General Conditions.
 - d. Notices of Hazardous Waste Conditions shall be submitted in accordance with paragraph 4.17 of General Conditions.
 - e. Notices of concealed or unknown conditions shall be submitted to make Owner aware of a potential change in scope of the work.
 - 2. Contractor shall be responsible for its costs to implement and administer RFI's and RFS's throughout the Contract duration. Regardless of the number of RFI's submitted, Contractor will not be entitled to additional compensation. Contractor shall be responsible for both CLPCCD's and Architect's administrative costs for answering its RFI's where the answer could reasonably be found by reviewing the Contract Documents, as determined by CLPCCD; such costs will be deducted from progress payments, in accordance with General Conditions 3.1.10.

3. Architect/Engineer may initiate changes by issuing a Supplemental Instruction (which shall require written approval of the Construction Manager).
4. Construction Manager may initiate changes by issuing Requests for Proposal (RFP) or a Field Change Notice (FCN) to Contractor. Such RFP's or FCN's will detail all proposed changes in the Work and request a quotation of changes in Contract Sum and Contract Times from Contractor. A RFP or FCN may require Contractor to expedite the work and proceed on a time and material (force account) basis.

1.03 PROCEDURE

- A. Contractor shall submit RFI to Construction Manager. Contractor shall reference each RFI to an activity on its Progress Schedule and note the time criticality of the RFI, indicating the time in which the response is required. Architect/Engineer shall respond by issuing a Clarification.
 1. If Contractor is satisfied with the Clarification and does not request change in Contract Sum or Contract Times, then the Clarification shall be executed without a change.
 2. If Contractor believes that the Clarification results in change in Contract Sum or Contract Times, Contractor shall notify Construction Manager who may then deny request for change or issue RFP.
- B. Contractor shall submit RFS to Construction Manager within 35 days of award of contract in accordance with General Conditions paragraph 4.8.
- C. Contractor shall submit Notices of Changes to resolve unanticipated conditions incurred in the execution of the Work. Procedures in Paragraph 9.6 of General Conditions shall be followed. If Construction Manager determines that a change in Contract Sum or contract Times is justified, Construction Manager shall issue RFP.
- D. Contractor shall submit Notices of Hazardous Waste Conditions to resolve problems regarding hazardous materials encountered in the execution of the Work. Procedures in Paragraph 4.17 of General Conditions shall be followed. If Construction Manager determines that a change in Contract Sum or contract Times is justified, Construction Manager shall issue RFP.
- E. Architect/Engineer shall issue Supplemental Instruction to the Construction Manager who shall forward onto Contractor. Contractor shall not proceed with Supplemental Instruction until Construction Manager approves it in writing.
 1. If Contractor is satisfied with Supplemental Instruction and does not request change in Contract Sum or Contract Times, then Supplemental Instruction shall be executed without a Change Order.
 2. If Contractor believes that Supplemental Instruction results in change in Contract Sum or Contract Times, Contractor shall notify Construction Manager. Construction Manager may then deny request for change, cancel Clarification or issue RFP.
- F. Responses by recipients shall be within a reasonable time.

- G. Contractor shall respond to Construction Manager's RFP within fifteen (15) working days by furnishing a complete breakdown of costs of both credits and extras; itemizing materials, labor, taxes, overhead and profit. Subcontract work shall be so indicated.
- H. Upon approval of RFP, Construction Manager will issue a Change Order directing Contractor to proceed with extra work.
- I. Payment shall be made as follows:
 - 1. Change Orders which increase Contract Sum or Contract Times shall be included in next Contract Modification Form, signed by Construction Manager, accepted by Contractor.
 - 2. Payment shall be made for Change Order work along with other work in progress payment following completion of Change Order work. Partial completion of Change Order work shall be paid for that part completed during the period covered by the monthly payment request.

1.04 COST DETERMINATION

- A. Total cost of extra work shall be the sum of labor costs, material costs, equipment rental costs and specialist costs as defined herein plus overhead and profit as allowed herein. This limit applies in all cases of claims for extra work, whether calculating Change Orders, or calculating claims of all types, and applies even in the event of fault, negligence, strict liability, or tort claims of all kinds, including misrepresentation, concealment, strict liability or negligence. No other costs arising out of or connected with the performance of extra work, of any nature, may be recovered by Contractor. No special, incidental or consequential damages may be claimed or recovered against CLPCCD, its representatives or agents, whether arising from breach of contract, negligence or strict liability, unless specifically authorized in the Contract Documents.
- B. Overhead:
 - 1. Overhead shall be as defined in Paragraph 1.08.
- C. Taxes:
 - 1. Alameda County Sales Tax should be included.
 - 2. Federal and Excise Tax shall not be included.
- D. Owner Operated Equipment
When owner-operated equipment is used to perform extra work, Contractor will be paid for equipment and operator as follows:
 - 1. Payment for equipment will be made in accordance with Paragraph 1.05.
C.
 - 2. Payment for cost of labor will be made at no more than rates of such labor established by California prevailing wage agreements for type of worker and location of work, whether or not owner-operator is actually covered by such an agreement.

1.05 COST BREAKDOWN

- A. Labor - Contractor will be paid cost of labor for workers (including fore persons when authorized by Construction Manager) used in actual and direct performance of extra work. Labor rate, whether employer is Contractor, subcontractor or other forces, will be sum of following:
1. **Actual Wages** - Actual wages paid shall be limited to the applicable prevailing wage rate for the classification of labor actually and reasonably necessary to complete a Change. Prevailing wage rates shall be deemed to include all direct payment of wages to workers completing a Change and all employer burdens thereon, including without limitation all employer payments to or on behalf of workers for Workers Compensation, health and welfare, pension, vacation and other similar labor burdens. Contractors and subcontractors are required to provide their corresponding wage rate breakdown for the classification of labor under which they will complete a Change and on the form provided by the Owner for review and approval by the Owner and Construction Manager prior to processing and approval of payment for any completed Change.
- B. **Material** - Only materials furnished by Contractor and necessarily used in performance of extra work will be paid for. Cost of such materials will be cost, including sales tax, to purchaser (Contractor, subcontractor or other forces) from supplier thereof, except, as the following are applicable:
1. If cash or trade discount by actual supplier is offered or available to purchaser, it shall be credited to CLPCCD notwithstanding fact that such discount may not have been taken.
 2. For materials salvaged upon completion of extra work, salvage value of materials shall be deducted from cost, less discount, of materials.
 3. If cost of a material is, in opinion of Construction Manager, excessive, then cost of material shall be deemed to be lowest current wholesale price at which material is available in quantities concerned delivered to Site, less any discounts as provided in subparagraph 1 above.
- C. Equipment Rental
- For Contractor or subcontractor-owned equipment, payment will be made at the lesser of actual rental rates or the rental rates listed for equipment in California Department of Transportation official equipment rental rate schedule which is in effect on date upon which extra work is accomplished and which schedule is incorporated herein by reference as though fully set forth herein. For rented equipment, payment will be made based on actual rental invoices. Equipment used on extra work shall be of proper size and type. If, however, equipment of unwarranted size or type and cost is used, cost of use of equipment shall be calculated at rental rate for equipment of proper size and type. Rental rates paid shall be deemed to cover cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals. Unless otherwise specified, manufacturer's ratings, and manufacturer-approved modifications, shall be used to classify equipment for determination of applicable rental rates. Individual pieces of equipment or tools not listed in said publication and having a

replacement value of five hundred dollars (\$500) or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefore as payment is included in payment for labor. Rental time will not be allowed while equipment is inoperative due to breakdowns.

1. For equipment on Site, rental time to be paid for equipment shall be the time equipment is in operation on extra work being performed. The following shall be used in computing rental time of equipment:
 - a. When hourly rates are listed, less than thirty (30) minutes of operation shall be considered to be one-half (1/2) hour of operation.
 - b. When daily rates are listed, less than four (4) hours of operation shall be considered to be one-half (1/2) day of operation. Anything over four (4) hours and not more than eight (8) hours is considered one (1) full day of operation.
2. For equipment, which must be brought to Site to be used exclusively on extra work, cost of transporting equipment to Site and its return to its original location shall be determined as follows:
 - a. CLPCCD will pay for costs of loading and unloading equipment.
 - b. Cost of transporting equipment in low bed trailers shall not exceed hourly rates charged by established haulers.
 - c. Cost of transporting equipment shall not exceed applicable minimum established rates of California Public Utilities Commission.
 - d. Payment for transporting, and loading and unloading equipment as above provided will not be made if equipment is used on Work in any other way than upon extra work.
3. Rental period shall begin at time equipment is unloaded at Site of extra work and terminate at end of day on which Construction Manager directs Contractor to discontinue use of equipment. Excluding Saturdays, Sundays, and legal holidays, unless equipment is used to perform extra work on such days, rental time to be paid per day shall be four (4) hours for zero (0) hours of operation, six (6) hours for four (4) hours of operation and eight (8) hours for eight (8) hours of operation, time being prorated between these parameters. Hours to be paid for equipment, which is operated less than eight (8) hours due to breakdowns, shall not exceed eight (8) less number of hours equipment is inoperative due to breakdowns.

D. Work Performed by Special Forces or Other Special Services

When Construction Manager and Contractor, by agreement, determine that special service or item of extra work cannot be performed by forces of Contractor or those of any subcontractors, service or extra work item may be performed by specialist. Invoices for service or item of extra work on basis of current market price thereof may be accepted without complete itemization of labor, material, and equipment rental costs when it is impracticable and not in accordance with established practice of special service industry to provide complete itemization. In those instances, wherein, Contractor is required to perform extra work necessitating a fabrication or machining process in a

fabrication or machine shop facility away from Site, charges for that portion of extra work performed in such facility may, by agreement, be accepted as a specialist billing. Construction Manager must be notified in advance of all offsite work. To specialist invoice price, less credit to CLPCCD for any cash or trade discount offered or available, whether or not such discount may have been taken, will be added 15 percent (15%) in lieu of overhead and profit provided in Paragraph 1.04.B.

1.06 FORCE-ACCOUNT

- A. If it is impracticable because of nature of work, or for any other reason, to fix an increase or decrease in price definitely in advance, Change Order may fix a maximum price which shall not under any circumstances be exceeded, and subject to such limitation, such alteration, modification or extra shall be paid for at actual necessary cost as determined by CLPCCD Authority, which cost shall be determined pursuant to Article 1.04, and shall be known as Force-Account work.
- B. Whenever any Force-Account work is in progress, definite price for which has not been agreed on in advance, Contractor shall report to Construction Manager each day in writing in detail amount and cost of labor and material used, and any other expense incurred in Force-Account work on preceding work day, and no claim for compensation for Force-Account work will be allowed unless report shall have been made. Daily report(s) shall be delivered to Construction Manager within one (1) business day of the day the work was performed. No late reports will be accepted. The intent is to have daily agreement on hours expended for labor and equipment on Force-Account work.
- C. Above described methods of determining payment for work and materials shall not apply to performance of work or furnishings of material, which, in judgment of Construction Manager, may properly be classified under items for which prices are established in Contract.

1.07 CLPCCD FURNISHED MATERIALS

CLPCCD reserves right to furnish materials, as it deems advisable, and Contractor shall have no claims for costs and overhead and profit on such materials.

1.08 OVERHEAD DEFINED

The following constitutes charges that are included in overhead for all contract modifications, including Force-Account work:

- 1. Drawings: field drawings, shop drawings, etc. including submissions of drawings
- 2. Routine field inspection of work proposed
- 3. General Superintendence
- 4. General administration and preparation of change orders
- 5. Computer services
- 6. Reproduction services

7. Salaries of project engineer, Construction Manager, superintendent, timekeeper, storekeeper and secretaries
8. Janitorial services
9. Temporary on-site facilities
 - a. Offices
 - b. Telephones
 - c. Plumbing
 - d. Electrical: Power, lighting
 - e. Platforms
 - f. Fencing, etc.
10. Home office expenses
11. Insurance Premium
12. Procurement and use of vehicles and fuel used coincidentally in base bid work
13. Surveying
14. Estimating
15. Protection of work
16. Final cleanup
17. Other incidental work
18. Record Drawings
19. Warranty
20. Transportation expense to site for labor

1.09 RECORDS AND CERTIFICATION

- A. Force-Account (cost reimbursement) charges shall be recorded daily upon Cost Breakdown for Contract Modification Form obtained from Inspector. Contractor or authorized representative shall complete and sign form. Inspector shall sign form for approval. Contract Modification Form shall provide names and classifications of workers and hours worked by each, itemize materials used, and also list size type and identification number of equipment, and hours operated, and shall indicate work done by specialists.
- B. No payment for Force-Account work shall be made until Contractor submits original invoices substantiating materials and specialist charges.
- C. CLPCCD shall have the right to audit all records in possession of Contractor relating to activities covered by Contractor's claims for modification of Contract, including Force-Account work, as set forth in General Conditions.
- D. Further, CLPCCD shall have right to audit, inspect, or copy all records maintained in connection with this Contract, including financial records, in possession of Contractor relating to any transaction or activity occurring or arising out of, or by virtue of, Contract. If Contractor is a joint venture, right of CLPCCD shall apply collaterally to same extent to records of joint venture sponsor, and of each individual joint venture member.

HGA
PROJECT # 4952-002

06/05/2024
DSA SPC_V2

BUILDING 3000
MAINTENANCE OPERATIONS
WAREHOUSE & GARAGE
DSA 01-121159

PART 2 – PRODUCTS

Not applicable to this section.

PART 3 – EXECUTION

Not applicable to this section.

SAMPLE ONLY
COST BREAKDOWN FORM FOR CONTRACT MODIFICATION

One separate form shall be used by Contractor, each first tier subcontractor and each lower tier subcontractor. One form for each shall be used for each change order. One form for each, for each day shall be used for Force-Account work.

COST BREAKDOWN FOR CONTRACTOR PRICE PROPOSAL
SHEET 1 OF 3

GENERAL CONTRACTOR FORM

PROJECT NUMBER: _____

PROJECT NAME: _____

CONTRACTOR : _____

CHANGE ORDER NUMBER : _____ **DATE:** _____

CHANGE ORDER DESCRIPTION: _____

SUMMARY OF TOTAL COSTS					
LABOR COSTS					
1. TOTAL LABOR COSTS		\$	-		
2. Fifteen percent (15%) of Line 1		\$	-		
3. Sum of Lines 1 & 2				\$	-
MATERIAL COSTS					
4. TOTAL MATERIAL COSTS		\$	-		
5. Fifteen percent (15%) of Line 4		\$	-		
6. Sum of Lines 4 & 5				\$	-
EQUIPMENT RENTAL COSTS					
7. TOTAL EQUIPMENT RENTAL COSTS		\$	-		
8. Fifteen percent (15%) of line 7		\$	-		
9. Sum of lines 7 & 8				\$	-
SUBCONTRACTED COST					
10. TOTAL OF SUBCONTRACTED COST		\$	-		
11. Five percent (5%) of line 10 (excluding subcontractor markup)		\$	-		
12. Sum of Lines 10 & 11				\$	-
SUBTOTAL OF DIRECT COSTS & MARK-UP				\$	-
COST OF BONDS (does not apply to subcontractors)				\$	-

HGA
PROJECT # 4952-002

06/05/2024
DSA SPC_V2

BUILDING 3000
MAINTENANCE OPERATIONS
WAREHOUSE & GARAGE
DSA 01-121159

				\$
				-
TOTAL EQUIPMENT RENTAL COSTS (Transfers to Line 7 of Sheet 1)				\$
				-

COST BREAKDOWN FORM FOR CONTRACT MODIFICATION

SHEET 3 OF 3

CHANGE ORDER NUMBER : _____ DATE: _____

CHANGE ORDER DESCRIPTION: _____

SUBCONTRACTED WORK		
SUBCONTRACTOR	DESCRIPTION OF WORK SUBCONTRACTED	COST
TOTAL COST OF SUBCONTRACTED WORK (Transfers to Line 10 of Sheet 1)		\$
		-

CONTRACTOR: _____ Date: _____

VERIFIED BY INSPECTOR: _____ Date: _____

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Project coordination.
- B. Field engineering.
- C. Coordination drawings.
- D. Workmanship.
- E. Incidental costs.
- F. Correspondence and Notices.
- G. Miscellaneous provisions.
- H. Damage and restoration.

1.02 RELATED SECTIONS

- A. Section 011100 - Summary of Work.
- B. Section 014500 - Quality Control.
- C. Section 015000 – Temporary Facilities.
- D. Section 017000 - Contract Closeout.

1.03 PROJECT COORDINATION

- A. Coordination scheduling, submittals, and Work of the various Sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Coordinate space requirements and installation of mechanical and electrical work, which are indicated diagrammatically on drawings. Follow route shown for pipes, ducts, and conduit, as closely as practicable: place runs parallel with line of building. Utilize space efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finished elements.
- E. Submit a copy of site drawing and certificate signed by the Civil Engineer that the elevations and locations of the Work of separate Sections in preparation for Substantial Completion.
- F. Coordinate completion and cleanup of Work of separate Sections in preparation for Substantial Completion.

- G. After Owner occupancy of the Site, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.04 FIELD ENGINEERING

- A. Contractor shall locate and protect survey control and reference points.
- B. Control datum for survey is that shown on drawings.
- C. Contractor shall verify setbacks and easements; confirm drawing dimensions and elevations.
- D. Provide field engineering services. Contractor shall establish lines, and levels, utilizing recognized engineering practices

1.05 COORDINATION DRAWINGS

- A. Provide information required by Architect for preparation of coordination drawings.
- B. Review drawings prior to submission to Architect.

1.06 WORKMANSHIP

- A. Work shall be performed by craftsmen well experienced and competent in their particular trade.
- B. Workmanship shall be thorough, finished and complete in every detail for finest quality installations as intended under these specifications.

1.07 INCIDENTAL COSTS

- A. In addition to cost associated with General Conditions Article 6: Insurance; Indemnity; Bonds:
 - 1. Utilities: Refer to Section 01 50 00.
 - 2. Contractors and Subcontractors shall furnish at their own cost and expense all tools, consumable supplies, appliances, equipment, etc., necessary for execution of their work; and shall be responsible for care and guarding thereof.
 - 3. Contractors and Subcontractors shall be entirely responsible for professional, trade, business or other licenses required by state statute or local government.

1.08 CORRESPONDENCE AND NOTICES

- A. Clearly identify correspondence, notices and submittals with project name, subject and detailed references to drawings and specifications.
- B. Notify Inspector or the Construction Manager two (2) working days in advance of required inspection.
- C. The District's project management system (ProjectTeams) shall be utilized for document controls for RFI, Submittals, Daily Logs, etc...

1.09 MISCELLANEOUS PROVISIONS

- A. Contractor shall immediately refer to the Construction Manager any requirement shown or specified which Contractor in their experience and background finds or believes:
 - 1. Is not equal to industry standards for achieving a first quality installation as intended;
 - 2. Is excessive in cost or effort to affect the intended results;
 - 3. Is below standard for proper enforcement of the guarantees required;
 - 4. Or, is at variance with governing laws, regulations, codes or standards.
- B. Work operations relative to any matter referred to Architect for consideration shall not proceed until receipt of appropriate instructions from Architect.
- C. Inspection of Work and Materials: Contractor shall immediately make a close and thorough inspection of all materials as delivered and all work in progress; shall promptly reject and return all defective materials and re-do; and shall check and verify adequate performance or satisfactory results of all tests and inspections before allowing sub-work to proceed.
- D. Warranty Period: During warranty periods, supervise investigation and correction of deficiencies found or occurring in the work.
- E. Shop Fabricate and pre-assemble interrelated parts where possible.
- F. Closing up of walls, partitions or furred spaces, backfilling and other covering up operations shall not proceed until all enclosed or covered work and inspections have been completed. Verify before proceeding.
- G. Provide holes, slots, cutouts, blocking, screeds, nailers, chases and similar preparation as the work progresses, as required to receive or pass subsequent work without damage to previously completed work.
- H. Exterior Work shall be made tight against direct or indirect entry of water into the concealed or interior spaces of the building. Seal joints or penetrations below grade or behind exterior trim and other conditions where water might enter the structure, as for exposed exterior work.
- I. Structural Connections and Fasteners: Include as required for complete fabrication and installation of the work; of materials, types and sizes adequate for the purposes.
 - 1. Place in concealed or obscured locations where possible.
 - 2. Include suitable welding or brazing where required.
- J. Powder Activated Fasteners: Limited to uses particularly shown, specified or approved by Architect. Operators shall be certified in accordance with California Industry Safety orders.
- K. Ferrous Work permanently exposed to exterior or below grade shall be galvanized; related accessory members and fastening non-ferrous, galvanized or made rustproof by approved methods.

- L. Galvanizing, prime painting and related touch-up and repair shall comply with requirements for metal fabricating and painting per project technical specifications.
- M. Isolation: Provide between ferrous and non-ferrous or dissimilar metal components to protect the work against electrolysis, as follows:
 - 1. For architectural work, provide cork fillers, asphaltic coatings, neoprene gaskets or similar separation as necessary; and use stainless steel fastenings only where interconnecting dissimilar parts.
 - 2. For mechanical and electrical work, provide dielectric unions or similar separation. In particular, provide isolation as necessary between exterior underground systems and interior above-grade systems where they meet dissimilar metals.
- N. Prior to starting a particular type or kind of work, examine for relevant information, all contract documents and subsequent data issued to the project.

1.10 DAMAGE AND RESTORATION

- A. Damage to previously existing or newly placed facilities caused by movement of equipment or other operations, whether accidental or made necessary by reason of Contract requirements, shall be restored or replaced as specified or directed by Architect or Construction Manager.
- B. Restoration shall be equal to the structural qualities or performance capacities of the original work, and finishes shall match the appearance of, as nearly as possible, like existing adjacent work. Restorations shall be subject to approval by Architect and shall be made as necessary at no added expense to Owner unless otherwise particularly provided for.
- C. Work not properly restored or where not capable of being restored as intended under these Specifications shall be removed and replaced as directed by Architect at no added expense to Owner.

PART 2 – PRODUCTS

Not applicable to this section.

PART 3 – EXECUTION

3.01 CUTTING AND PATCHING

- A. Employ skilled and experienced installer to perform cutting and patching.
- B. Submit written request in advance of cutting or altering elements, which affects:
 - 1. Structural integrity of element.
 - 2. Integrity of weather-exposed or moisture-resistant elements.
 - 3. Efficiency, maintenance, or safety of element.
 - 4. Visual qualities of sight-exposed elements.
- C. Execute cutting, fitting, and patching including excavation and fill, to complete Work, and to:

1. Fit the several parts together, to integrate with other Work.
 2. Uncover Work to install or correct ill-timed work.
 3. Remove and replace defective and non-conforming Work.
 4. Remove samples of installed Work for testing.
 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.
- D. Execute work by methods, which will avoid damage to other Work, and provide proper surfaces to receive patching and finishing.
- E. Cut rigid materials using masonry saw or core drill.
- F. Restore Work with new products in accordance with requirements of Contract Document.
- G. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- H. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.
- I. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.
- J. Identify any hazardous substance or condition exposed during the Work to the Construction Manager for decision or remedy.

END OF SECTION

PART1 – GENERAL

1.01 SUMMARY

- A. This section describes the required meetings for this work. These meetings include:
 - 1. Pre-construction Conference
 - 2. Scheduling Meetings
 - 3. Progress Meetings
 - 4. Special Meetings
- B. Related Sections
 - 1. Section 01 11 00: Summary of Work
 - 3. Section 01 32 00: Progress Schedules and Reports
 - 4. Section 01 33 00: Submittals

1.02 PRECONSTRUCTION CONFERENCE

- A. Construction Manager will call for and administer Pre-construction Conference at time and place to be announced. Conference will occur as soon after award as can be reasonably scheduled.
- B. Contractor, all subcontractors, and major suppliers shall attend Pre-construction Conference.
- C. Agenda will include, but not be limited to, the following items:
 - 1. Schedules
 - 2. Personnel
 - 3. Use of the Site
 - 4. Temporary Utilities
 - 5. Location of Contractor's on-site facilities
 - 6. Project access
 - 7. Employee parking
 - 8. Security/Safety
 - 9. Housekeeping
 - 10. Submittals
 - 11. Inspection and testing procedures, on-site and off-site
 - 12. Utility shutdown procedures
 - 13. Control and reference point survey procedures
 - 14. Injury and Illness Prevention Program
 - 15. Contractor's Initial CPM Schedule
 - 16. Contractor Invoicing, Schedule of Values, Approval Procedures

- D. Construction Manager will distribute copies of minutes to attendees. Attendees shall have five (5) working days to submit comments or additions to minutes. Minutes will constitute final memorialization of results of the Pre-construction Conference.

1.03 SCHEDULING MEETINGS

- A. Meet with Construction Manager and Architect on Start Date of Contract and conduct initial review of Contractor's draft Shop Drawing and Sample Submittal Schedule, and draft Schedule of Values and Initial Construction Schedule ("Schedule Review Meeting").
- B. Authorized representative in Contractor's organization, designated in writing, who will be responsible for working and coordinating with Construction Manager's representative(s) and Architect relative to preparation and maintenance of Progress Schedule shall attend initial Schedule Review Meeting.
- C. Contractor shall, within thirty (30) days from the Notice to Proceed date, meet with Construction Manager and Architect to review the Original CPM Schedule submittal.
1. Contractor shall have its manager, superintendent, scheduler, and key subcontractor representatives, as required by CLPCCD, in attendance. The meeting will take place over a continuous one-day period.
 2. CLPCCD's review of Schedule Submittals will be limited to conformance to Contract requirements, including, but not limited to, coordination requirements. However, review may also include:
 - a. Clarifications of Contract Requirements
 - b. Directions to include activities and information missing from submittal
 - c. Requests to Contractor to clarify its schedule
 3. Within five (5) days of the initial Schedule Review Meeting, Contractor shall respond in writing to all questions and comments expressed by CLPCCD at the meeting.
- D. Construction Manager will administer scheduling meetings and shall distribute minutes of scheduling meetings to attendees. Attendees shall have five (5) working days to submit comments or additions to minutes. Minutes will constitute final memorialization of results of the scheduling meetings.

1.04 PROGRESS MEETINGS

- A. Construction Manager and Architect will schedule and administer Progress Meetings throughout duration of Work. Progress meetings will be held weekly unless otherwise directed by Construction Manager.
1. Meetings shall be held at Construction Manager's on-site office unless otherwise directed by Construction Manager.
 2. Construction Manager will prepare agenda and distribute to Contractor, Inspector and Architect/Engineer 24 hours in advance of meeting.
 3. Construction Manager will preside at meeting.

4. Architect will record and distribute minutes to Contractor, Inspector, Construction Manager, all other participants, and those affected by decisions made at meeting, within three (3) working days after meeting. Attendees shall have five (5) working days to submit comments or additions to minutes. Minutes will constitute final memorialization of results of progress meetings.
- B. Progress Meetings shall be attended by Contractor's job superintendent, major subcontractors and suppliers, when requested by Construction Manager or as appropriate, Construction Manager, Architect/Engineer, Inspector and others as appropriate to agenda topics for each meeting.
- C. Agenda will contain the following items as appropriate:
 1. Review of work progress
 2. Status of Construction Schedule, adjustments
 3. Submittals
 4. Delivery schedules
 5. Utility shutdowns, traffic disruptions, and interferences with public scheduled during the subsequent 2 weeks
 6. Quality control
 7. Pending changes
 8. Substitutions
 9. Review of Contractor's safety program activities and results, including report on all serious injury and/or damage accidents
 10. Safety
 11. Other items affecting progress of work
- D. A separate meeting will be held on approximately the 25th of each month to review the schedule update submittal and progress payment application.
 1. At this meeting, at a minimum, the following items will be reviewed:
 - a. percent complete of each activity
 - b. time impact evaluations for Change Orders and Time Extension Request
 - c. actual and anticipated activity sequence changes
 - d. actual and anticipated duration changes
 - e. actual and anticipated contractor delays
 2. These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate personnel attend. At a minimum, these meetings shall be attended by Contractor's General Superintendent and Scheduler.
 3. Contractor shall plan on progress meetings taking no less than four (4) hours.

1.05 SPECIAL MEETINGS

- A. Special meetings may be called by any party by notifying all desired participants, Construction Manager, Architect, and Inspector four (4) working days in

- advance, giving reason for meeting. Special Meetings may be held without advance notice in emergency situations.
- B. At any time during the progress of the Work, CLPCCD shall have authority to require Contractor to attend conference of any or all of the contractors engaged in the Work or in other work, and notice of such conference shall be duly observed and complied with by Contractor.
 - C. Contractor shall schedule and conduct coordination meetings as necessary to discharge coordination responsibilities in the General Conditions. Construction Manager shall be given five (5) days written notice of coordination meetings. Contractors shall maintain minutes of coordination meetings. Attendees shall have five (5) working days to submit comments or additions to minutes. Minutes will constitute final memorialization of results of the meetings.
 - D. Pre-installation meetings of manufactures' warranty scope of work, i.e., roofing, water-proofing, curtain wall, etc.
 - E. LEED kick-off meeting.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION

PART 1 – GENERAL

1.01 SUMMARY

- A. Scheduling of Work under this Contract shall be performed by Contractor in accordance with requirements of this Section.
1. Development of schedule, cost and manpower loading of the schedule and schedule updates, monthly payment requests and project status reporting requirements of the Contract shall employ computerized Critical Path Method (CPM) scheduling.
 2. Submit schedules and reports as specified in General Conditions.
- B. Upon Award of Contract, Contractor shall immediately commence development of Initial and Original CPM Schedules to ensure compliance with CPM schedule submittal requirements.
- C. Related Sections:
1. Section 01 11 00: Summary of Work
 2. Section 01 33 00: Submittals
- D. Definitions: The following definitions apply to this section:
- ACTIVITY:** A task, event or other project element on a schedule that contributes to completing the project. Activities have a description, start date, finish date, duration and one or more logic ties.

BASELINE SCHEDULE: The initial schedule representing the Contractor's work plan on the first day of the project.

CRITICAL PATH: The longest continuous chain of activities for the project that has the least amount of total float of all chains. In general, a delay on the critical path will extend the scheduled completion date.

CRITICAL PATH METHOD (CPM): A network based planning technique using activity durations and the relationships between activities to mathematically calculate a schedule for the entire project.

DATA DATE: The day after the date through which a schedule is current. Everything occurring earlier than the data date is "as-built" and everything on or after the data date is "planned".

EARLY COMPLETION TIME: The difference in time between an early scheduled completion date and the contract completion date.

FLOAT: The difference between the earliest and latest start or finish times for an activity.

MILESTONE: An event activity that has zero duration and is typically used to represent the beginning or end of a certain stage of the project.

NARRATIVE REPORT: A document submitted with each schedule that discusses topics related to project progress and scheduling.

NEAR CRITICAL PATH: A chain of activities with total float exceeding that of the critical path but having no more than 14 calendar days of total float.

SCHEDULED COMPLETION DATE: The planned project finish date shown on the current accepted schedule.

SUBSTANTIAL COMPLETION: The stage in the progress of the work when the work is complete in accordance with the Contract Documents, so that District can occupy or use the work for its intended purpose.

TIME IMPACT ANALYSIS: A schedule and narrative report developed specifically to demonstrate what effect a proposed change or delay has on the current scheduled completion date.

TIME-SCALED NETWORK DIAGRAM: A graphic depiction of a CPM schedule comprised of activity bars with relationships for each activity represented by arrows. The tail of each arrow connects to the activity bar for the predecessor and points to the successor.

TOTAL FLOAT: The amount of time that an activity or chain of activities can be delayed before extending the scheduled completion date.

UPDATED SCHEDULE: A current schedule developed from the baseline or subsequent schedule through regular monthly review to incorporate as-built progress and any planned changes.

1.02 QUALIFICATIONS

- A. Contractor shall employ experienced scheduling personnel qualified to use the latest version of Primavera Project Planner or Microsoft Project scheduling software. Experience level required is set forth below. Contractor may employ such personnel directly or may employ a consultant for this purpose. After bid opening, the apparent successful low bidder shall provide CLPCCD a written verification that Contractor has the required personnel under its employ or that Contractor will employ the required CPM scheduling consultant.
1. The written statement shall identify individual who will perform CPM scheduling.
 2. Capability and experience shall be verified by description of construction projects on which individual has successfully applied computerized CPM.
 3. Required level of experience shall include at least two projects of similar nature, scope and value not less than three-fourths the Total Bid Price of this Project. The written statement shall provide contact persons for referenced projects with current telephone and address information.
- B. CLPCCD reserves right to approve Contractor's scheduler, or consultant, and right to reject them at any time. CLPCCD also reserves right to refuse replacement of Contractor's scheduler or consultant, if it believes such replacement will negatively affect Contract.

1.03 GENERAL

- A. Progress Schedule shall be based on and incorporate milestones and completion dates specified in Contract Documents. Submit to the Owner baseline, monthly updated, and final updated schedules, each consistent in all respects with the time and order of work requirements of the contract. Work must be executed in the sequence indicated on the current accepted schedule. Schedules must show the order in which you propose to execute the work with logical links between time-scaled work activities and calculations made using the critical path method to determine the controlling activities. You are responsible for assuring that all activity sequences are logical and that each schedule shows a coordinated plan for complete performance of the work.
- B. Overall time of completion and time of completion for each milestone shown on Progress Schedule shall adhere to times as stated in Contract Agreement, unless an earlier (advanced)

time of completion is requested by Contractor and agreed to by CLPCCD. Any such agreement shall be formalized by a Change Order.

1. CLPCCD is not required to accept an earlier (advanced) schedule, i.e., one that shows early completion dates for the Contract Times.
 2. Contractor shall not be entitled to extra compensation in the event agreement is reached on an earlier (advanced) schedule and Contractor completes its Work, for whatever reason (excepting approved changes with added time components) beyond completion date shown in earlier (advanced) schedule but within the Contract Times.
 3. A schedule showing the work completed in less than the Contract Times, which has been accepted by CLPCCD, shall be considered to have Project Float. The Project Float is the time between the scheduled completion of the work and Contract Substantial Completion. Project Float is a resource available to both CLPCCD and the Contractor.
- C. Float Ownership: Neither CLPCCD nor Contractor owns float. The Project owns the float. As such, liability for delay of the Substantial Completion Date rests with the party whose actions, last in time, actually cause delay to the Substantial Completion Date.
1. For example, if Party A uses some, but not all of the float and Party B later uses remainder of the float as well as additional time beyond the float, Party B shall be liable for the time that represents a delay to the Substantial Completion Date.
 2. Party A would not be responsible for the time since it did not consume the entire float and additional float remained; therefore, the Substantial Completion Date was unaffected.
- D. Progress Schedule shall be the basis for evaluating job progress, payment requests, and time extension requests associated with the changes. Responsibility for developing Contract CPM schedule and monitoring actual progress as compared to Progress Schedule rests with Contractor.
- E. The Owner's review and acceptance of schedules does not waive any contract requirements and does not relieve Contractor of any obligation or responsibility for submitting complete and accurate information. Correct rejected schedules and resubmit corrected schedules to the Owner within seven (7) days of notification by the Owner, at which time a new review period of seven (7) days will begin.
- Errors or omissions on schedules do not relieve Contractor from finishing all work within the time limit specified for completion of the contract. If, after a schedule has been accepted by the Owner, either the Contractor or the Owner discovers that any aspect of the schedule has an error or omission, it must be corrected on the next updated schedule.
- F. Use Microsoft Project for Windows or Primavera P6. Such software shall be compatible with Windows operating system. Contractor shall transmit contract schedule files to CLPCCD on CD-ROM or flash drive at times requested by CLPCCD.
- G. Transmit each item under form approved by CLPCCD.
1. Identify Project with CLPCCD Contract number and name of Contractor and file by date, project, and update number.
 2. Provide space for Contractor's approval stamp and CLPCCD's review stamps.
 3. Submittals received from sources other than Contractor will be returned to the Contractor without CLPCCD's review.

1.04 INITIAL CRITICAL PATH METHOD (CPM) SCHEDULE

- A. Initial CPM Schedule submitted for review at the pre-construction conference shall serve as Contractor's schedule for up to ninety (90) calendar days after the Notice to Proceed.
- B. Indicate detailed plan for the Work to be completed in first sixty (60) days of the Contract; details of planned mobilization of plant and equipment; sequence of early operations; and procurement of materials and equipment. Show Work beyond sixty (60) calendar days in summary form.
- C. Initial CPM Schedule shall be time-scaled.
- D. Initial CPM Schedule shall be cost and manpower loaded. Accepted cost and manpower-loaded schedule will be used as basis for monthly progress payments until acceptance of the Original CPM Schedule. Use of Initial CPM Schedule for progress payments shall not exceed sixty (60) calendar days.
- E. CLPCCD and Contractor shall meet to review and discuss the Initial CPM Schedule within seven (7) calendar days after it has been submitted to CLPCCD.
 1. CLPCCD's review and comment on the schedule shall be limited to Contract conformance (with sequencing, coordination, and milestone requirements) and accepted CPM principals.
 2. Contractor shall make corrections to schedule necessary to comply with Contract requirements and shall adjust schedule to incorporate any missing information requested by CLPCCD. Contractor shall resubmit Initial CPM Schedule if requested by CLPCCD.
- F. If, during the first sixty (60) days after Notice-to-Proceed, the Contractor is of the opinion that any of the Work included on its Initial CPM Schedule has been impacted, the Contractor shall submit to CLPCCD a written Time Impact Evaluation (TIE) in accordance with Article 1.09 of this Section. The TIE shall be based on the most current update of the Initial CPM Schedule.

1.05 ORIGINAL CRITICAL PATH METHOD (CPM) SCHEDULE

- A. Submit a detailed proposed Original CPM Schedule presenting an orderly and realistic plan for completion of the Work, in conformance with requirements as specified herein.
- B. The baseline schedule must not extend beyond the number of contract days. The baseline schedule must have a data date of the first working day of the contract and not include any completed work to date. The baseline schedule must not attribute negative float or negative lag to any activity.
- C. Progress Schedule shall include or comply with following requirements:
 1. Time scaled, cost and manpower loaded CPM schedule.
 2. No activity on schedule shall have duration longer than twenty-one (21) calendar days, with exception of submittal, approval, fabrication and procurement activities, unless otherwise approved by CLPCCD.
 - a. Activity durations shall be total number of actual days required to perform that activity.
 - b. Activity coding capabilities to sort by responsibility, location, phase and CSI division.
 3. The start and completion dates of all items of Work, their major components, and milestone completion dates, if any.
 4. CLPCCD-furnished materials and equipment, if any, identified as separate activities.

5. Completion of the last activity in the schedule shall be constrained by the contract completion date. Schedule calculations shall result in a negative float when the calculated early finish date of the last activity is later than the contract completion date. The Contractor shall include as the last activity in the project schedule an activity called "Final Completion". The "Final Completion" activity shall have an "LF" constraint date equal to the contract completion date for the project, and with a zero day duration or by using the "project must finish by" date in the scheduling software. The schedule shall have no constrained dates other than those specified in the contract. The use of artificial float constraints such as "zero free float" or "zero total float" are typically prohibited. There shall only be two (2) open ended activities: Start Project (or NTP) with no predecessor logic and Final Completion with no successor logic.
6. Processing/approval of submittals and shop drawings for all Contract-required material and equipment. Activities that are dependent on submittal acceptance or material delivery shall not be scheduled to start earlier than expected acceptance or delivery dates.
 - a. Include time for submittals, resubmittals, and reviews by CLPCCD. Coordinate with accepted schedule for submission of shop drawings, samples and other submittals.
 - b. Contractor shall be responsible for all impacts resulting from resubmittal of shop drawings and submittals.
7. Procurement of all contract required material and equipment, identified as separate activity.
 - a. Include time for fabrication and delivery of manufactured products for the Work.
 - b. Show dependencies between procurement and construction.
8. Complete activity description; what Work is to be accomplished and where.
9. The total cost of performing each activity shall be total of labor, material, equipment, excluding overhead and profit of Contractor. Total overhead and profit of the General Contractor shall be shown on a separate activity in the schedule. Sum of cost for all activities shall equal total Contract value.
10. Resources required (labor) to perform each activity.
11. Responsibility code for each activity corresponding to Contractor or Subcontractor responsible for performing the Work.
12. Identify the activities, which constitute the controlling operations or critical path. No more than twenty-five (25%) of the activities shall be critical or near critical. Near critical is defined as float in the range of one (1) to ten (10) days.
13. At least twenty-eight (28) calendar days for developing punch list(s), completion of punch list items and final clean-up for the Work or any designated portion thereof. No other activities shall be scheduled during this period.
14. Interface with the work of other contractors, CLPCCD, and agencies such as, but not limited to, utility companies.
15. Show detailed Subcontractor Work activities. In addition, furnish copies of Subcontractor schedules upon which CPM was built.
 - a. Also furnish for each Subcontractor, as determined by CLPCCD, submitted on Subcontractor letterhead a statement certifying that Subcontractor concurs with Contractor's Original CPM Schedule and that Subcontractor's related schedules have

- been incorporated, including activity duration, cost and resource loading.
- b. Subcontractor schedules shall be independently derived and not a copy of Contractor's schedule.
 - c. In addition to Contractor's schedule and resource loading, obtain from electrical, mechanical and plumbing Subcontractors, and other Subcontractors as required by CLPCCD, productivity calculations common to their trades, such as units per person day, feet of pipe per day per person, feet of wiring per day per person, and similar information.
 - d. Furnish schedule for Contractor/Subcontractor CPM Schedule meetings which shall be held prior to submission of Original CPM Schedule to CLPCCD. CLPCCD shall be permitted to attend scheduled meetings as an observer.
16. Activity durations shall be in calendar days.
17. Submit with the schedule a list of anticipated non-Work days, such as weekends and holidays.
- D. Original CPM Schedule Review Meeting: Contractor shall, within thirty (30) calendar days from the Notice to Proceed date, meet with CLPCCD to review the Original CPM Schedule submittal.
1. Contractor shall have its Construction Manager, Project Superintendent, Project Scheduler, and key Subcontractor representatives, as required by CLPCCD, in attendance. The meeting will take place over a continuous one-day period.
 2. CLPCCD's review will be limited to submittal's conformance to Contract requirements, including, but not limited to, coordination requirements. However, review may also include:
 - a. Accepted critical path method principles and tenets.
 - b. Clarifications of Contract Requirements.
 - c. Directions to include activities and information missing from submittal.
 - d. Requests to Contractor to clarify its schedule.
 3. Within five (5) days of the Schedule Review Meeting, Contractor shall respond in writing to all questions and comments expressed by CLPCCD at the Meeting.

1.06 ADJUSTMENTS TO CRITICAL PATH METHOD (CPM) SCHEDULE

- A. Adjustments to Original CPM Schedule: Contractor shall have adjusted the Original CPM Schedule submittal to address all review comments from original CPM Schedule review meeting and resubmit network diagrams and reports for CLPCCD's review.
1. CLPCCD, within fourteen (14) days from date that Contractor submitted the revised schedule, will either:
 - a. accept schedule and cost and resource loaded activities as submitted, or
 - b. advise Contractor in writing to review any part or parts of schedule which either do not meet Contract requirements or are unsatisfactory for CLPCCD to monitor Project's progress, resources and status or evaluate monthly payment request by Contractor.
 2. CLPCCD may accept schedule with conditions that the first monthly CPM schedule update be revised to correct deficiencies identified.

3. When schedule is accepted, it shall be considered as the "Original CPM Schedule" which will then be immediately updated to reflect the current status of the work.
 4. CLPCCD reserves the right to require Contractor to adjust, add to, or clarify any portion of schedule which may later be discovered to be insufficient for monitoring of Work or approval of partial payment requests. No additional compensation will be provided for such adjustments, additions, or clarifications.
- B. Acceptance of Contractor's schedule by CLPCCD will be based upon schedule's compliance with Contract requirements and accepted CPM principles.
1. By way of Contractor assigning activity durations and proposing sequence of Work, Contractor agrees to utilize sufficient and necessary management and other resources to perform work in accordance with the schedule.
 2. Upon submittal of schedule update, updated schedule shall be considered "current" CPM schedule.
 3. Submission of Contractor's schedule to CLPCCD shall not relieve Contractor of total responsibility for scheduling, sequencing, and pursuing Work to comply with requirements of Contract Documents, including adverse effects such as delays resulting from ill-timed work.
- C. Submittal of Original CPM Schedule, and subsequent schedule updates, shall be understood to be Contractor's representation that the Schedule meets requirements of Contract Documents and that Work shall be executed in sequence indicated on the schedule.
- D. Contractor shall distribute Original CPM Schedule to Subcontractors for review and written acceptance, which shall be noted on Subcontractors' letterhead to Contractor and transmitted to CLPCCD for the record.

1.07 MONTHLY CPM SCHEDULE UPDATE SUBMITTALS

- A. Following acceptance of Contractor's Original CPM Schedule, Contractor shall monitor progress of Work and adjust schedule each month to reflect actual progress and any pre-approved changes to planned activities or logic.
1. Each schedule update submitted shall be complete, including all information requested for the Original CPM Schedule submittal.
 2. Each update shall continue to show all work activities including those already completed. These completed activities shall accurately reflect "as built" information by indicating when activities were actually started and completed.
- B. A meeting will be held on approximately the twenty-fifth (25th) of each month to review the schedule update submittal and progress payment application.
1. At this meeting, at a minimum, the following items will be reviewed: Percent complete of each activity; time impact evaluations for Change Orders and Time Extension Request; anticipated activity sequence changes; anticipated duration changes; actual and anticipated contractor delays.
 2. These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate personnel attend. At a minimum, these meetings shall be attended by Contractor's General Superintendent and Scheduler.
 3. Contractor shall plan on the meeting taking no less than four (4) hours.

- C. Within seven (7) calendar days after monthly schedule update meeting, Contractor shall submit the updated CPM Schedule update.
- D. Within seven (7) calendar days of receipt of above noted revised submittals, CLPCCD will either accept or reject monthly schedule update submittal.
 - 1. If accepted, percent complete shown in monthly update will be basis for Application for Payment by the Contractor. The schedule update shall be submitted as part of the Contractor's Application for Payment.
 - 2. If rejected, update shall be corrected and resubmitted by Contractor before the Application for Payment is submitted.
- E. Updating, changing or revising of any report, curve, schedule or narrative submitted to CLPCCD by Contractor under this Contract, nor CLPCCD's review or acceptance of any such report, curve, schedule or narrative shall not have the effect of amending or modifying, in any way, the Contract Substantial Completion date or milestone dates or of modifying or limiting, in any way, Contractor's obligations under this Contract.
- F. Final Updated Schedule. Submit final updated, as-built schedule with actual start and finish dates for the activities, within 30 days after completion of contract work. Provide a written certificate with this submittal signed by your Project Manager or an officer of the company stating, "To my knowledge and belief, the enclosed final update schedule reflects that actual start date and finish dates of the actual activities for the project contained herein". An officer of the company may delegate in writing the authority to sign the certificate to a responsible manager.

1.08 SCHEDULE REVISIONS

- A. Updating the Schedule to reflect actual progress shall not be considered revisions to the Schedule. Since scheduling is a dynamic process, revisions to activity durations and sequences are expected on a monthly basis.
- B. To reflect revisions to the schedule, the Contractor shall provide CLPCCD with a written narrative with a full description and reasons for each Work activity revised. For revisions affecting the sequence of work, the Contractor shall provide a schedule diagram which compares the original sequence to the revised sequence of work. The Contractor shall provide the written narrative and schedule diagram for revisions two (2) working days in advance of the monthly schedule update meeting.
- C. Schedule revisions shall not be incorporated into any schedule update until the revisions have been reviewed by CLPCCD. CLPCCD may request further information and justification for schedule revisions and Contractor shall, within three (3) days, provide CLPCCD with a complete written narrative response to CLPCCD's request.
- D. If the Contractor's revision is still not accepted by CLPCCD, and the Contractor disagrees with CLPCCD's position, the Contractor has seven (7) calendar days from receipt of CLPCCD's letter rejecting the revision, to provide a written narrative providing full justification and explanation for the revision. The Contractor's failure to respond in writing within seven (7) calendar days of CLPCCD's written rejection of a schedule revision shall be contractually interpreted as acceptance of CLPCCD's position, and the Contractor waives its rights to subsequently dispute or file a claim regarding CLPCCD's position.
- E. At CLPCCD's discretion, the Contractor can be required to provide subcontractor certifications of performance regarding proposed schedule revisions affecting said subcontractors.

1.09 RECOVERY SCHEDULE

- A. If the Schedule Update shows a substantial completion date fourteen (14) calendar days beyond the Contract Substantial Completion date, or individual milestone completion dates, the Contractor shall submit to CLPCCD the proposed revisions to recover the lost time within seven (7) calendar days. As part of this submittal, the Contractor shall provide a written narrative for each revision made to recapture the lost time. If the revisions include sequence changes, the Contractor shall provide a schedule diagram comparing the original sequence to the revised sequence of work.
- B. The revisions shall not be incorporated into any schedule update until the revisions have been reviewed by CLPCCD.
- C. If the Contractor's revisions are not accepted by CLPCCD, CLPCCD and the Contractor shall follow the procedures in paragraph 1.08.C, 1.08.D and 1.08.E above.
- D. At CLPCCD's discretion, the Contractor can be required to provide subcontractor certifications for revisions affecting said subcontractors.

1.10 TIME IMPACTS EVALUATION (TIE) FOR CHANGE ORDERS, AND OTHER DELAYS

- A. Time Impact Analysis (TIA). Submit a written TIA to the Owner with each request for adjustment of contract time, or when the Contractor or the Owner considers that an approved or anticipated change may impact the critical path or contract progress.
The TIA must illustrate the impacts of each change or delay on the current scheduled completion date or internal milestone, as appropriate. The analysis must use the accepted schedule that has a data date closest to and before the event. If the Owner determines that the accepted schedule used does not appropriately represent the conditions before the event, the accepted schedule must be updated to the day before the event being analyzed. The TIA must include an impact schedule developed from incorporating the event into the accepted schedule by adding or deleting activities, or by changing durations or logic of existing activities. If the impact schedule shows that incorporating the event modifies the critical path and scheduled completion date of the accepted schedule, the difference between scheduled completion dates of the two schedules must be equal to the adjustment of contract time. The Owner may construct and use an appropriate project schedule or other recognized method to determine adjustments in contract time until the Contractor provide the TIA.
- B. Contractor shall be required to comply with the requirements of Paragraph 1.09.A for all types of delays such as, but not limited to, Contractor/Subcontractor delays, adverse weather delays, strikes, procurement delays, fabrication delays, etc.
- C. Contractor shall be responsible for all costs associated with the preparation of Time Impact Analysis, and the process of incorporating them into the current schedule update. The Contractor shall provide CLPCCD with 4 copies of each TIA.
- D. Once agreement has been reached on a TIA, the Contract Times will be adjusted accordingly. If agreement is not reached on a TIA, the Contract Times may be extended in an amount CLPCCD allows, and the Contractor may submit a claim for additional time claimed by Contractor.

1.11 TIME EXTENSIONS

- A. The Contractor is responsible for requesting time extensions for time impacts that, in the opinion of the Contractor, impact the critical path of the current schedule update. Notice of time impacts shall be given in accord with Articles 1.12 and 1.15 of Contract Document General Conditions.

- B. Where an event for which CLPCCD is responsible impacts the projected Substantial Completion date, the Contractor shall provide a written mitigation plan, including a schedule diagram, which explains how (e.g., increase crew size, overtime, etc.) the impact can be mitigated. The Contractor shall also include a detailed cost breakdown of the labor; equipment and material the Contractor would expend to mitigate CLPCCD caused time impact. The Contractor shall submit its mitigation plan to CLPCCD within fourteen (14) calendar days from the date of discovery of said impact. The Contractor is responsible for the cost to prepare the mitigation plan.
- C. Failure to request time, provides TIA, or provides the required mitigation plan will result in Contractor waiving its right to a time extension and cost to mitigate the delay.
- D. No time will be granted under this Contract for cumulative effect of changes.
- E. CLPCCD will not be obligated to consider any time extension request unless requirements of Contract Documents are complied with.
- F. Failure of the Contractor to perform in accordance with the current schedule update shall not be excused by submittal of time extension requests.
- G. If the Contractor does not submit a TIA within the required fourteen (14) calendar days for any issue, it is mutually agreed that the Contractor does not require a time extension for said issue.

1.12 SCHEDULE REPORTS

- A. Submit four (4) copies of the following reports with the Initial CPM Schedule, the Original CPM Schedule, and each monthly update.
- B. Required Reports:
 - 1. Two (2) activity-listing reports: one sorted by activity number and one by total float. These reports shall also include each activity's early/late and actual start and finish dates, original and remaining duration, float, responsibility code and the logic relationship of activities.
 - 2. Cost report sorted by activity number including each activity's associated cost, percentage of Work accomplished, earned value to-date, previous payments and amount earned for current update period.
 - 3. Schedule plots presenting time scaled network diagram showing activities and their relationships with the controlling operations or critical path clearly highlighted.
 - 4. Cash flow report calculated by early start, late start and indicating actual progress. Provide an exhibit depicting this information in graphic form.
- C. Furnish CLPCCD with report files in CD ROM and containing all Microsoft Project .mpp or Primavera .xer schedule files along with report files.

1.13 PROJECT STATUS REPORTING

- A. In addition to submittal requirements for CPM scheduling identified in this Section, Contractor shall provide a monthly project status report (i.e., written narrative report) to be submitted in conjunction with each CPM Schedule as specified herein. Status reporting shall be in form specified below.
- B. Contractor shall prepare monthly written narrative reports of status of Project for submission to CLPCCD. Written status reports shall include:
 - 1. Transmittal letter
 - 2. Work completed during the period, percent complete of activities

3. Identification of unusual conditions or restrictions regarding labor, equipment or material: including multiple shifts, 6-day work weeks, specified overtime or work at times other than regular days or hours
4. Description of the current critical path
5. Changes to the critical path and scheduled completion date since the last schedule submittal
6. Description of problem areas
7. Current and anticipated delays:
 - 7.1 Cause of delay
 - 7.2 Impact of delay on other activities, milestones and completion dates
 - 7.3 Corrective action and schedule adjustments to correct the delay
8. Contractor may include any other information pertinent to status of Project. Contractor shall include additional status information requested by CLPCCD at no additional cost.
9. Status reports, and the information contained therein, shall not be construed by the Contractor as claims, notice of claims, notice of delay, or requests for changes or compensation.

1.14 WEEKLY SCHEDULE REPORT

At the Weekly Progress Meeting, the Contractor shall provide and present a time scaled four (4) week schedule one (1) week behind and three (3) week look ahead schedule that is based and correlated by activity number to the current schedule (i.e., Initial, Original CPM, or Schedule Update).

1.15 DAILY CONSTRUCTION REPORTS

On a daily basis, Contractor shall submit a daily activity report to CLPCCD for each workday, including weekends and holidays, when worked. Contractor shall develop the daily construction reports on a computer generated database capable of sorting daily Work, manpower and man-hours by Contractor, Subcontractor, area, sub area, and change order work. Upon request of CLPCCD, furnish computer disk of this database. Obtain CLPCCD's written approval of daily construction report database format prior to implementation. Include in report:

- A. Project name and Project number.
- B. Contractor's name and address.
- C. Weather, temperature and any unusual site conditions.
- D. Brief description and location of the day's scheduled activities and any special problems and accidents, including Work of Subcontractors. Descriptions shall be referenced to CPM scheduled activities.
- E. Worker quantities for its own Work force and for Subcontractors of any tier.
- F. Equipment, other than hand tools, utilized by Contractor and Subcontractors.

1.16 PERIODIC VERIFIED REPORTS

The Contractor shall complete and submit the Final Verified Report required by DSA. In addition to other conditions precedent to Final Payment, the Contractor's completion and submission of the Final Verified Report is an express condition precedent to the District's obligation to make the Final Payment. In addition to completion and submission of the Final Verified Report, as a material obligation under the

HGA
PROJECT # 4952-002

06/05/2024
DSA SPC_V2

BUILDING 3000
MAINTENANCE OPERATIONS
WAREHOUSE & GARAGE
DSA 01-121159

Contract Documents, the Contractor shall comply all DSA requests for reports or other data relating to the Work, the status thereof or conformity of the Work to the Contract Documents.

PART 2 – PRODUCTS

Not applicable to this section.

PART 3 – EXECUTION

Not applicable to this section.

END OF SECTION

PROGRESS SCHEDULES AND REPORTS

SECTION 01 32 00

BID NO.: X/XX-XX CLPCCD DISTRICT TEMPLATE (REPLACE WITH BID NUMBER, PROJECT NUMBER AND NAME)
Division 1 General Requirements

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals including:
 - 1. Procedures
 - 2. Schedule of Shop Drawing and Sample Submittals
 - 3. Safety Plan
 - 4. Progress Schedule
 - 5. Product Data
 - 6. Shop Drawings
 - 7. Samples
 - 8. Quality Control Submittals
 - 9. Design Data
 - 10. Test Reports
 - 11. Certificates
 - 12. Manufacturers' Instructions
 - 13. Machine Inventory Sheets Operations and Maintenance Manuals Computer Programs
 - 14. Project Record Documents
 - 15. LEED Submittals

1.3 RELATED SECTIONS

- A. Section 01 11 00: Summary of Work.
- B. Section 01 26 00: Contract Modification Procedures.
- C. Section 01 32 00: "Progress Schedules and Reports" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
- D. Section 01 70 00: Contract Closeout
- E. Section 01 78 00: Project Record Documents.

1.4 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Architect's responsive action.

- B. Informational Submittals: Written information that does not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.5 SUBMITTAL PROCEDURES

- A. General: Electronic copies of CAD Drawings of the Contract Drawings are always through Architect for Contractor's use in preparing submittals. Files are used as background use only.
- B. 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 require 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.
- C. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.
- D. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Construction Manager'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 15 work days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Construction Manager will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
- E. Submit at own expense, a minimum of two (2) printed sets or copies and one (1) electronic PDF set- Schedule of Shop Drawing and Sample Submittals, Safety Plans, Progress Schedule, Product Data, Shop Drawings, Samples, Quality Control Data, Machine Inventory Sheets, Operations and Maintenance Manuals, Computer Programs, and Project Record Documents required by the Contract Documents.
- F. Transmit each item with a standard letter of transmittal in form approved by Construction Manager.
- G. Identify project, Contractor, subcontractor, major supplier, pertinent drawing sheet and detail number, and specification section number as appropriate. Provide space for Contractor, Construction Manager and Architect/Engineer review stamps.
- H. Where manufacturer's standard drawings or data sheets are used, they shall be marked clearly to show those portions of the data, which are applicable to this project.
- I. Submit Shop Drawings, Samples and other submittals to Construction Manager for review and approval by Architect/Engineer in accordance with accepted schedule of Shop Drawings and Samples submittals. If no such schedule is agreed upon, then all Shop Drawing, Samples and product data submittals shall be completed within ninety (90) days after receipt of Notice to Proceed from CLPCCD.
- J. The data shown on the Shop Drawings shall be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to show Architect/Engineer the materials and equipment Contractor proposes to provide and to enable Architect/Engineer to review

the information for the limited purposes specified below. Samples shall be identified clearly as to material, supplier, pertinent data such as catalog numbers and the use for which it is intended and otherwise as Architect/Engineer may require enabling Architect/Engineer to review the submittal. The number of each Sample to be submitted will be as specified in the Specifications.

- K. At the time of each submission, Contractor shall give Construction Manager, Architect/Engineer, and Inspector specific written notice of all variations, if any; that the Shop Drawing or Sample submitted may have from the requirements of the Contract Documents, and the reasons therefore. This written notice shall be in a written communication separate from the submittal. In addition, Contractor shall cause a specific notation to be made on each Shop Drawing and Sample submitted to Construction Manager for review and approval of each such variation by Architect/Engineer. The Architect/Engineer may make adjustments to submittals that may result in changes to the contract. The appropriate change order request should be prepared by the Contractor within ten (10) days of receipt of submittals.
- L. If CLPCCD accepts deviation, CLPCCD shall issue appropriate Contract Modification.
- M. Submittal coordination and verification is responsibility of Contractor; this responsibility shall not be delegated in whole or in part to subcontractors or suppliers. Before submitting each Shop Drawing or Sample, Contractor shall have determined and verified:
1. All field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar information with respect thereto;
 2. All materials with respect to intended use, fabrication, shipping, handling, storage, assembly and installation pertaining to the performance of the Work; and
 3. All information relative to Contractor's sole responsibilities and of means, methods, techniques, sequences and procedures of construction and safety precautions and programs incident thereto.
- N. Contractor shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.
- O. Contractor's submission to Construction Manager of a Shop Drawing or Sample submittal will constitute Contractor's representation that it has satisfied its obligations under the Contract Documents, and as set forth immediately above, with respect to Contractor's review and approval of that submittal.
- P. Designation of work "by others", if shown in submittals, shall mean that work will be responsibility of Contractor rather than subcontractor or supplier who has prepared submittals.
- Q. After review by Architect/Engineer of each of Contractor's submittals, one electronic set will be returned to Contractor with actions defined as follows:
1. NO ACTION TAKEN – Submittal is unreviewed.
 2. NO EXCEPTIONS TAKEN - Accepted subject to its compatibility with future submittals and additional partial submittals for portions of the work not covered in this submittal. Does not constitute approval or deletion of specified or required items not shown on the submittal.
 3. MAKE CORRECTIONS NOTED (NO RESUBMISSIONS REQUIRED) - Same as 2. above, except that minor corrections as noted shall be made by Contractor.
 4. REVISE AND RESUBMIT - Rejected because of major inconsistencies or errors which shall be resolved or corrected by Contractor prior to subsequent review by Architect/Engineer.
 5. REJECTED (RESUBMIT) - Submitted material does not conform to Plans and Specifications in major respect, i.e.: wrong size, model, capacity, or material.

- R. It is considered reasonable that Contractor shall make a complete and acceptable submittal at least by second submission.
1. CLPCCD reserves the right to deduct monies from payments due Contractor to cover additional costs of Architect's/Engineer's review beyond the second submission. Illegible submittals will be rejected and returned to Contractor for resubmission.
- S. Favorable review will not constitute acceptance by CLPCCD or Architect/Engineer of any responsibility for the accuracy, coordination and completeness of the submittals. Accuracy, coordination, and completeness of Submittals shall be sole responsibility of Contractor, including responsibility to back check comments, corrections, and modifications from CLPCCD's or Architect's/Engineer's review before fabrications. Submittals may be prepared by Contractor, subcontractors, or suppliers, but Contractor shall ascertain that submittals meet requirements of Contract Documents, while conforming to structural space and access conditions at point of installation. Architect/Engineer's review will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Favorable review of submittal, method of work, or information regarding materials and equipment Contractor proposes to furnish shall not relieve Contractor of responsibility for errors therein and shall not be regarded as assumption of risks or liability by Architect/Engineer or CLPCCD, or any officer or employee thereof, and Contractor shall have no claim under Contract on account of failure or partial failure or inefficiency or insufficiency of any plan or method of work or material and equipment so accepted. Favorable review shall be considered to mean merely that Architect/Engineer or CLPCCD has no objection to Contractor using, upon his own full responsibility, plan or method of work proposed, or furnishing materials and equipment proposed.
- T. Architect's/Engineer's review will not extend the means, methods, techniques, sequences or procedures of construction or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
- U. Submit complete initial submittal for those items where required by individual specification Sections. Complete submittal shall contain sufficient data to demonstrate that items comply with Specifications, shall meet minimum requirements for submissions cited in technical specifications, shall include motor data and seismic anchorage certifications, where required, and shall include necessary revisions required for equipment other than first named. If Contractor submits incomplete initial submittal, when complete submittal is required, submittal may be returned to Contractor without review.
- V. It shall be Contractor's responsibility to copy, conform and distribute reviewed submittals in sufficient numbers for Contractor's files, subcontractors and vendors.
- W. After Architect/Engineer review of submittal, revise and resubmit as required. Identify changes made since previous submittal.
1. Begin no fabrication or work, which require submittals until return of submittals not requiring resubmittal.
 2. Normally, submittals will be processed and returned to Construction Manager within fifteen (15) working days of receipt by Architect. The processing time spent to review submittals by Construction Manager shall be in addition to the fifteen (15) days.
 3. Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions.

1.6 SCHEDULE OF SHOP DRAWING, DSA DEFERRED APPROVAL SUBMITTALS AND SAMPLE SUBMITTALS

- A. Submit preliminary Schedule of Shop Drawing and Sample Submittals as required by General Conditions. Submit two (2) copies and one (1) electronic PDF of final and accepted schedule of

submittals of shop drawings and samples as required by General Conditions, and in no event later than thirty (30) days following Notice of Award.

- B. Schedule of Shop Drawing and Sample Submittals will be used by Architect/Engineer to schedule their activities relating to review of submittals. Schedule of submittals shall indicate a spreading out of submittals and early submittals of long lead-time items and of items, which require extensive review.
- C. Schedule of Shop Drawing and Sample Submittals shall be reviewed by Construction Manager and shall be revised and resubmitted until accepted by Construction Manager.
- D. DSA Deferred Approval Submittals shall be prepared for review by the Architect/Engineer within 30 days of receipt of Notice to Proceed. Contractor shall promptly make corrections to documents for Architect to submit to DSA for approval. Contractor shall have the sole responsibility for obtaining DSA approval via the Architect's office for all deferred approval submittals in a timely manner. There will be no time extensions granted for delay in obtaining such approval.

1.7 SAFETY PLAN

- A. Submit one (1) copies and one (1) electronic PDF of Safety Plan specific to this Contract to Construction Manager within fifteen (15) calendar days after Start Date of the Contract Time.
- B. No on-site work shall be started until Safety Plan has been reviewed and accepted by CLPCCD. Acceptance of Safety Plan shall not affect Contractor's responsibility for maintaining a safe working place and instituting safety programs in connection with project in full compliance with local, state and federal regulations.

1.8 PROGRESS SCHEDULE

- A. Schedule all items requiring Architect action for submission during first 25 percent of construction period.
- B. See Section 01 32 00 "Progress Schedules and Reports" for schedule and report requirements.
- C. Submit (3) print copies, one (1) electronic report file in PDF format, and either Microsoft Project .mpp or Primavera .xer schedule program files:
 - 1. Initial CPM Schedule at the Pre-construction Conference.
 - 2. Original CPM Schedule within thirty (30) days of Notice to Proceed (NTP).
 - 3. Adjustments to the CPM Schedule as required.
 - 4. CPM Schedule updates monthly, five (5) days prior to monthly progress meeting.
- D. Submit three (3) copies and one (1) electronic PDF copy of the reports listed in Section 01 32 00 "Progress Schedules and Reports" with:
 - 1. Initial CPM Schedule
 - 2. Original CPM Schedule
 - 3. Each monthly Schedule update
 - 4. Each weekly three (3) week look ahead Schedule
- E. Progress Schedules and Reports shall be submitted electronically, in addition to hard copies as specified above.

1.9 QUALITY CONTROL SUBMITTALS

- A. Design Data: Not applicable.
- B. Test Reports: Three (3) copies minimum. One (1) copy will be marked with Architect's/Engineer's review comments and returned to Contractor.
 - 1. Indicate that material or product conforms to or exceeds specified requirements.
 - 2. Reports may be from recent or previous tests on material or product, but must be acceptable to Construction Manager. Comply with requirements of each individual specification Section.
- C. Certificates: Three (3) copies minimum. One (1) copy will be marked with Architect's/Engineer's review comments and returned to Contractor.
 - 1. Indicate that material or product conforms to or exceeds specified requirements.
 - 2. Submit supporting reference data, affidavits, and certifications as appropriate.
 - 3. Certificates may be recent or from previous test results on material or product, but must be acceptable to Construction Manager.
- D. Manufacturers' Instructions: Three (3) copies minimum. One (1) copy will be marked with Architect's/Engineer's review comments and returned to Contractor.
 - 1. Include manufacturer's printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing.
 - 2. Identify conflicts between manufacturer's instructions and Contract Documents.

1.10 COMPUTER PROGRAMS

- A. When any equipment requires operation by computer programs, submit copy of program on CD(s) plus all user manuals and guides for operating the programs and making changes in the programs for upgrading and expanding the databases. Provide required licenses to CLPCCD at no additional cost.
 - 1. Include at least three (3) years prepaid software license renewals, which includes software upgrades and updates.

1.11 PROJECT RECORD DOCUMENTS

- A. Submit one copy of each of the Project Record Documents listed in Section 01 70 00 Contract Closeout.

1.12 DELAY OF SUBMITTALS

- A. Delay of submittals by Contractor is considered avoidable delay. Liquidated damages incurred because of late submittals will be assessed to the Contractor.

PART 2 - PRODUCTS

2.1 SUBMITTALS

- A. Within fifteen (15) calendar days after Start Date of the Contract Time submit two (2) copies and one (1) electronic PDF of complete list of substitutions of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. Contractor shall be responsible for and make all submissions.
 - 1. Submit items specified herein to Architect and Construction Manager.

2. Submit all submittals through the Construction Manager's Electronic Submittal Program.
 3. Identify each transmittal using the 6-digit specification number, i.e., metal handrails might be numbered 05 5000, along with an individual submittal number for each section number. Submittal numbers shall be sequential. If returning submittal "12" for re-submission, second submission would be identified as "12A". Should submittal be rejected multiple times (12b, 12c, etc), the Contractor may be required to reimburse the Owner/Architect for labor to review subsequent submissions.
 4. Develop, for maintenance by the Construction Manager, a schedule of all submittals and their status. Refer to Paragraph 1.3 below. The schedule will be reviewed each week at the project meeting.
- C. Transmittals, shop drawings, or samples submitted to Architect shall have the Contractor's stamp on it with his signature and be marked "approved." Contractor's stamp on these items indicates that Contractor has performed the following:
1. Verified field dimensions and quantities.
 2. Verified field construction criteria, materials, catalog numbers and similar data.
 3. Reviewed and coordinated submittal data with requirements of the Work and the Contract Documents.
 4. ITEMS NOT STAMPED BY THE CONTRACTOR WILL BE RETURNED UNREVIEWED.
- D. Indicate any item, component, material or portion of Work, which deviates from Contract Documents. Unless such departures are accepted as indicated in paragraph "Review" below, such departures will not be permitted.
- E. Make submittals sufficiently in advance of data required to allow Architect reasonable time for review and additional resubmission and review cycles if necessary.
1. Items submitted without Contractor's review stamp will be returned, without action, for resubmission.
 2. Items not submitted in accordance with provisions of this Section will be returned, without action, for resubmission.
 3. Submissions on items not approved for use by specifications or addenda will be rejected.
 4. Drawings transmitted by other than the Prime Contractor will be returned to the Prime Contractor without action of any kind. Drawings will not be returned to subcontractors.

2.2 SUBMITTALS – PRODUCT DATA

- A. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.
- B. Tabulate products by specification section number.
- C. Supplemental Data:
 1. Submit number of copies, which Contractor requires, plus three (3) copies, which will be retained by Construction Manager.
 2. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information unique to Project.
- D. Provide copies for Project Record Documents described in Section 01 70 00 Contract Closeout.

2.3 SUBMITTALS - SHOP DRAWINGS

- A. Identify drawings with manufacturer, item, use, type, project designation, specification section or drawing detail reference.
- B. Minimum Sheet Size: 8-1/2 inches by 11 inches. All others: Multiples of 8-1/2 inches by 11 inches, 34 inches by 44 inches maximum.
- C. For 8-1/2 inch by 11 inch and 11 inch by 17-inch sheets, submit number of copies, which contractor requires plus three (3) copies, which will be retained by Construction Manager.
- D. For 17 inch by 22 inch through 34 inch by 44-inch sheets, submit one [1] electronic and a minimum of three [3] prints. After review, reproduce and distribute.
- E. Original sheet or reproducible transparency will be marked with Architect's/Engineer's review comments and returned to Contractor.
- F. Each sheet/copy must include project name and project number and bid number on all sheets.
- G. Mark each copy to identify applicable Products, models, options, and other data; supplement manufacturers' standard data to provide information unique to Work.
- H. Include manufacturers' installation instructions when required by specification section.
- I. Submit a copy of the Shop Drawing Transmittal Form with each submittal and resubmittal.

2.4 SUBMITTALS - SAMPLES

- A. Identify samples with manufacturer's name, item, use, type, project designation, specification section or drawing detail reference, color, range, texture, finish and other pertinent data.
 - 1. Submit samples to illustrate functional and aesthetic characteristics of Product, with integral parts and attachment devices. Coordinate submittal of different categories for interfacing work.
- B. Submit full range of manufacturers' standard colors, textures, and patterns for Construction Manager's selection.
- C. Submit a minimum of three (3) samples unless otherwise specified in the construction documents.
- D. Sizes: Unless otherwise specified, provide the following:
 - 1. Paint Chips: Manufacturers' standard
 - 2. Flat or Sheet Products: Minimum 6 inches square, maximum 12 inches square
 - 3. Linear Products: Minimum 6 inches, maximum 12 inches long
 - 4. Bulk Products: Minimum 1 pint, maximum 1 gallon
- E. Full size samples may be used in Work upon approval.
- F. Mock-ups:
 - 1. Erect field samples and mock-ups at Project site in accordance with requirements of Specification sections.
 - 2. Modify or make additional field samples and mock-ups as required to provide appearance and finishes approved by Construction Manager.
 - 3. Approved field samples and mock-ups may be used in Work upon approval.
- G. Architect may, at his option, retain samples for comparison purposes until completion of Work.

1. Samples will be returned or may be used in the Work unless the technical section specifically indicates otherwise.
 2. Remove samples when directed.
 3. Pay all costs of furnishing or constructing, and removing samples.
- H. Resubmit samples of rejected items.
- I. 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.
- J. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit three copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
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. 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 and Construction Manager.
- B. 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 REVIEW

- A. General: Architect and Construction Manager will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect and Construction Manager will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect and Construction Manager will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken.
- C. Reproduce and distribute submittals that the Architect reviews and stamps as follows, to indicate the action taken:
 1. Reviewed: Where submittal is marked "Reviewed," that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.

2. Reviewed -- Additional Information Required: Where submittal is marked "Reviewed -- Additional Information Required," the information submitted has been reviewed and approved as noted. However, additional information as noted and/or required by Contract Documents needs to be submitted.
 3. Make Corrections As Noted: When submittal is marked "Furnish As Corrected," that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.
 4. Submit Specified Item: When submittal is marked "Revise and Resubmit," do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.
 - a. Do not permit submittals marked "Revise and Resubmit" to be used at the Project site, or elsewhere where Work is in progress.
 5. Rejected: When submittal is marked "Rejected," information submitted is not in compliance with Contract Documents. Resubmit submittal as required by Contract Documents.
- D. Contractor shall retain 1 copy of each "Reviewed," "Reviewed -- Additional Information Required" or "Furnish as Corrected" submittal on file at the job site.
- E. Architect shall retain 1 copy of each "Reviewed," "Reviewed -- Additional Information Required" or "Furnish as Corrected" submittal in the project file.
- F. Contractor shall resubmit items stamped "Revise and Resubmit" or "Rejected" by Architect.
1. Provide a print of previous drawing with resubmission for comparison.
 2. Add letter suffix to previous transmittal number, to indicate resubmission.
 3. It shall be the Contractor's responsibility to assure that previously approved documents are destroyed when they are superseded by a resubmittal.
- G. Architect review is general and does not:
1. Permit departure from Contract Documents.
 2. Relieve Contractor from responsibility for errors in detail, in dimensions or related items.
 3. Approve departure from previous instructions or details.
 4. Relieve Contractor of the responsibility to provide all components, wiring, etc., required to make item operable or usable.
 5. Imply acceptance of items for which no data is submitted.
- H. For items constituting a departure from Contract Documents see Section 01 2500.
- I. Reviewed samples submitted or constructed and approved by Architect constitute criterion for judging completed work. Finish work or items not equal to samples will be rejected.
- J. Start of work which requires submittals, prior to return of submittals with Architect or Owner's stamp indicating review and approval is at Contractor's risk.

3.3 DISTRIBUTION

- A. Contractor shall copy and distribute all "Reviewed," "Reviewed -- Additional Information Required" or "Furnish as Corrected" submittals, including one copy to the Owner.

HGA
PROJECT # 4952-002

06/05/2024
DSA SPC_V2

BUILDING 3000
MAINTENANCE OPERATIONS
WAREHOUSE & GARAGE
DSA 01-121159

- END OF SECTION -

SUBMITTAL PROCEDURE

SECTION 01 33 00

BID NO.: X/XX-XX CLPCCD DISTRICT TEMPLATE (REPLACE WITH BID NUMBER, PROJECT NUMBER AND NAME)
Division 1 General Requirements

PART 1 – GENERAL

1.01 SUMMARY

This section includes regulatory requirements applicable to Contract.

1.02 REFERENCES TO REGULATORY REQUIREMENTS

- A. Codes, laws, ordinances, rules and regulations referred to shall have full force and effect as though printed in full in these specifications.
- B. Conform to referenced codes, laws, ordinances, rules and regulations, which are in effect on date of receipt of bids.

1.03 CODES

Codes, which apply to Contract, include, but are not limited to, the following:

- A. Current California Building Code (Part 2, Title 24, C.C.R.)
- B. Current California Electrical Code (Part 3, Title 24, C.C.R.)
- C. Current California Mechanical Code (Part 4, Title 24, C.C.R.)
- D. Current California Plumbing Code (Part 5, Title 24, C.C.R.),
- E. Current State Elevator Safety Regulations (Part 7, Title 24, C.C.R.)
- F. Current California Fire Code (Part 9, Title 24, C.C.R.)
- G. Current California Energy Code (Part 6, Title 24, C.C.R.)

1.04 LAWS, ORDINANCES, RULES AND REGULATIONS

- A. During prosecution of Work to be done under Contract, comply with applicable laws, ordinances, rules and regulations, including, but not limited to, the following:
 - B. Federal
 - 1. Americans With Disabilities Act
 - 2. 29 CFR, Section 1910.1001, Asbestos
 - 3. 40 CFR, Subpart M, National Emission Standards for Asbestos
 - 4. Executive Order 11246
 - C. State of California
 - 1. California Code of Regulations, Titles 5, 8, 19, 21, 24
 - 2. California Education Code
 - 3. California Public Contract Code
 - 4. California Health and Safety Code
 - 5. California Government Code
 - 6. California Labor Code
 - 7. California Civil Code
 - 8. California Code of Civil Procedure
 - 9. CPUC General Order 95, Rules for Overhead Electric Line Construction

10. CPUC General Order 128, Rules for Construction of Underground Electric Supply and Communications Systems

D. State of California Agencies

Bay Area Air Quality Management District (BAAQMD / www.baaqmd.gov)

State and Consumer Services Agency

Department of General Services

Division of the State Architect

E. Local Agencies:

City of Hayward, California (www.ci.hayward.ca.us)

City of Livermore, California [Livermore, CA | Home \(livermoreca.gov\)](http://Livermore, CA | Home (livermoreca.gov))

1.06 COMPLIANCE WITH AMERICANS WITH DISABILITIES ACT

A. Contractor acknowledges that, pursuant to the Americans with Disabilities Act (ADA), programs, services and other activities provided by a public entity to the public, whether directly or through a contractor, must be accessible to the disabled public. Contractor shall provide the services specified in this Agreement in a manner that complies with the ADA and any and all other applicable federal, state and local disability rights legislation. Contractor agrees not to discriminate against disabled persons in the provision of services, benefits or activities provided under this Agreement and further agrees that any violation of this prohibition on the part of Contractor, its employees, agents or assigns shall constitute a material breach of this Agreement.

PART 2 – PRODUCTS

Not applicable.

PART 3 – EXECUTION

Not applicable.

END OF SECTION

PART 1 – GENERAL

1.01 SUMMARY

- A. This section includes regulatory requirements applicable to Contract work in connection with hazardous waste abatement and disposal, including, but not limited to, asbestos and asbestos containing materials, lead based paint, polychlorinated biphenyls, petroleum contaminated soils and materials, construction and demolition debris and any other hazardous substance or hazardous waste.
- B. This section supplements Section 01 41 00 and the work specific listings of applicable regulatory requirements elsewhere in the specifications.
- C. Related Sections.
 - 1. Section 01 41 00: Regulatory Requirements.

1.02 REFERENCES TO REGULATORY REQUIREMENTS

- A. Codes, laws, ordinances, rules and regulations applicable to the Work shall have full force and effect as though printed in full in these specifications. Codes, laws, ordinances, rules and regulations are not furnished to Contractor, since Contractor is assumed to be familiar with their requirements. The listing herein of applicable codes, laws and regulations for hazardous waste abatement work is supplied to Contractor as a courtesy and shall not limit Contractor's responsibility for complying with all applicable laws, regulations or ordinances having application to the Work. Where conflict among the requirements or with these specifications exists, the most stringent requirements shall be used.
- B. Contractor's work shall conform to all applicable codes, laws, ordinances, rules and regulations that are in effect on date of receipt of bids.

1.03 LAWS, ORDINANCES, RULES AND REGULATIONS

- A. During prosecution of Work under Contract, Contractor shall comply with applicable laws, ordinances, rules and regulations, including, but not limited to, those listed below.
- B. Federal:
 - 1. Statutory Requirements:
 - a. Resource Conservation and Recovery Act, 42 U.S.C.. 6901 et seq.
 - b. Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, 42 U.S. C" 9601 et seq.
 - c. Toxic Substances Control Act of 1976, 15 U.S.C.. 2601 et seq.
 - d. Hazardous Materials Transportation Act of 1975, 49 U.S. C" 1801 et seq.
 - e. Clean Water Act, 33 U.S.C.. 1251 et seq.
 - f. Safe Drinking Water Act, 42 U.S. C.. 3001 et seq.
 - g. Clean Air Act, section 112, 42 U.S. C.. 7412

- h. Occupational Safety and Health Act of 1970, 29 U.S.C.. 651 et seq.
 - i. Underground Storage Tank Law, 42 U.S. C.. 6991 et seq.
 - j. The Emergency Planning and Community Right to Know Act of 1986, 42 U.S.C.. 11001 et seq.
2. Environmental Protection Agency (EPA):
- a. 40 C.F.R. Parts. 260, 264, 265, 268, 270
 - b. 40 C.F.R. Parts 258 et seq.
 - c. 40 C.F.R. Part 761
 - d. 40 C.F.R. Parts 122-124
3. Occupational Safety and Health Administration (OSHA):
- a. OSHA Worker Protection Standards, Title 29 CFR Part 1926.58, Construction Standards and 29 CFR 1910.1001 General Industry Standard
 - b. OSHA, 29 C. F. R. Part 1926.1101, Construction Standards for Asbestos
 - c. OSHA, Lead Exposure in Construction: Interim Final Rule, 29 C.F.R. 1926.62
 - d. National Emission Standard for Hazardous Air Pollutants, Title 40 CFR Part 61
 - e. Asbestos Hazardous Emergency Response Act, Title 40 C.F.R. 763
4. Department of Transportation:
- a. Title 49 C.F.R. 173.1090
 - b. Title 49 C.F.R.172
 - c. Title 49 C.F.R. 173
 - d. DOT, HM 181 and MH126f
- C. State of California Requirements:
1. Statutory Law:
- a. The Carpenter-Presley-Tanner Hazardous Substance Account Act, Cal. Health & Saf. Cod~ 25300 et seq.
 - b. Health and Safety Cod~ 25359.4
 - c. Hazardous Waste Control Law, Health & Safety Code. 25100 § seq.
 - d. Porter Cologne Water Quality Control Act, Cal. Water Cod~ 13000 et seq.
 - e. Health and Safety Cod~ 25915-25924
 - f. Cal. Labor Code Chapter 6, including, without limitation, . 6382, 6501.5-6501.9,6503.5, 9021.5, 9080
 - g. Cal. Bus. and Prof. Code, including without limitation, . 7058.5, 7065.01, 7118.5. Underground Storage of Hazardous Substance Act,
 - h. Cal. Health & Saf. Cod~ 25280 § seq.

- i. Petroleum Underground Storage Tank Cleanup, Health and Safety Cod~ 25299.10 et seq.
- j. Safe Drinking Water and Toxic Enforcement Act of 1986, Health & Saf. Cod~ 25249.5 et seq. (Proposition 65)
- k. Above Ground Petroleum Storage Act, Health and Safety Code. 25270 et seq.
2. Hazardous Materials Release Response Plans and Inventory, California Health and Safety Code Chapter 6.95.
3. Administrative Code and Regulations:
 - a. 22 C.C.R.. 6600 et seq.
 - b. Title 22 C.C.R.. Standards for Management of Hazardous and Extremely Hazardous Waste
 - c. DTSC Treatment Standard for PCB Wastes, Title 22 C.C.R.,. 66268.110
 - d. Cal OSHA Worker Protection Standards, Title 8 C.C.R.. 1529, 5208
 - e. Title 8 C. C. R.. 1532.1, Lead in Construction
 - f. 22 C.C.R.. 66999(b)
 - g. Title 23 C.C.R.. 2610 et seq.
4. Local Agency Requirements:
 - a. Bay Area Air Quality Management District, Fugitive Dust Rules
 - b. Bay Area Air Quality Management District Regulation 11-2-303
 - c. State Water Resource Control Board, General Construction Activity Stormwater Permit Requirements (Order 92-0S DWQ)
5. City Requirements:
 - a. Hayward Fire Department (www.haywardcal.us/fire_dept/fd.htm)
 - b. Livermore-Pleasanton Fire Department [Livermore Fire Department | Home Fire \(lpfire.org\)](http://livermorefire.org)
 - c. Livermore Municipal Water Department [Recycled Water | Livermore, CA \(livermoreca.gov\)](http://recycledwater.livermoreca.gov)
 - d. Ordinances

1.04 PERMITS

- A. Contractor shall comply with, implement or acknowledge effectiveness of all CLPCCD held permits, and initiate and cooperate in securing all required notifications or approvals therefore, including but not limited to permits affecting environmental work and the following:
 1. BAAQMD, Permit to Excavate or Treat Contaminated Soil;
 2. State Water Resources Control Board, General Construction Activity Stormwater Permit

HGA
PROJECT # 4952-002

06/05/2024
DSA SPC_V2

BUILDING 3000
MAINTENANCE OPERATIONS
WAREHOUSE & GARAGE
DSA 01-121159

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION

PART 1 – GENERAL

1.01 DSA DEFERRED APPROVALS

- A. Refer to Contract Drawings.

1.02 INSPECTION AND SUPERVISION

- A. Supervision by DSA shall be in accordance with Section 4-334 of Part 1, Title 24, CCR.
- B. District shall employ a full-time Project Inspector approved by DSA. The Project Inspector shall observe construction in accordance with Section 4-333(b) and 4-342 of Part 1, Title 24, CCR.
- C. Reports: Project Inspector shall submit the following in accordance with DSA IR A-7.
 - 1. Start of Project Report: Notify DSA of start of construction in accordance with Section 4-331 of Part 1, Title 24, CCR.
 - 2. Semi-Monthly Reports: Comply with Section 4-337 of Part 1, Title 24, CCR.
 - 3. Verified Reports: Comply with Section 4-336 of Part 1, Title 24, CCR.
- D. Special Inspection Requirements:
 - 1. Comply with Section 4-333(c) of Part 1, Title 24, CCR.
 - 2. Special inspection costs are to be paid by the Owner.
 - 3. Conduct special inspection as per DSA Structural Tests and Inspections Sheet (SSS 103-1).

1.03 TESTING LABORATORY REQUIREMENTS

- A. Comply with Section 4-335 of Part 1, Title 24, CCR.
- B. The Owner shall select the testing Laboratory approved by DSA, Architect, and Structural Engineer.
- C. Sampling and testing shall be performed by properly qualified persons in accordance with American Society for Testing and Materials (ASTM) standards.
- D. Conduct tests as per DSA Structural Tests and Inspections Sheet (SSS 103-1).
- E. Submit one copy of test reports to DSA.

1.04 ADDENDA AND CHANGE ORDERS

- A. Comply with Section 4-338 of Part 1, Title 24, CCR.
- B. Comply with DSA IR A-6.
- C. Obtain DSA approval for changes to code-regulated construction and inspection/testing functions prior to start of that work. Code-regulated construction refers to work that is regulated by code provisions applicable to public school construction, including those adopted by DSA Structural Safety (DSA/SS), DSA Access Compliance (DSA/AC) and State Fire Marshal (SFM).
- D. Changes can be approved through either the change order (CO) process or preliminary change order (PCO) process. Comply with DSA IR A-6, Sub-paragraph 2.2 - Change Order Process and DSA IR A-6, Sub-paragraph 2.1 - Preliminary Change Order Process.
- E. Do not begin any work under addendum or change order until required DSA written approval is obtained.

HGA
PROJECT # 4952-002

06/05/2024
DSA SPC_V2

BUILDING 3000
MAINTENANCE OPERATIONS
WAREHOUSE & GARAGE
DSA 01-121159

PART 2 – PRODUCTS

Not Applicable.

PART 3 – EXECUTION

Not Applicable.

END OF SECTION

PART 1 – GENERAL

1.01 SUMMARY

- A. This section includes reference standards, abbreviations, symbols and definitions used in Contract Documents.
- B. Full titles and edition dates are given in this section for standards cited in other sections of Specifications.
- C. Material and workmanship specified by reference to number, symbol, or title of specific standard such as state standard, commercial standard, federal specifications, technical society, or trade association standard, or other similar standard shall comply with requirements of standards except when more rigid requirements are specified or required by applicable codes.
- D. Standards referred to, except as modified herein, shall have full force and effect as though printed in the Contract Documents. Standards are not furnished to Contractor, since manufacturers and trades involved are assumed to be familiar with their requirements.

1.02 REFERENCE TO STANDARDS AND SPECIFICATIONS OF TECHNICAL SOCIETIES; REPORTING AND RESOLVING DISCREPANCIES:

- A. Reference to standards, specifications, manuals or codes of any technical society, organization or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard, specification, manual, code or laws or regulations in effect at the time of opening of Bids, except as may be otherwise specifically stated in the Contract Documents.
- B. If during the performance of the Work, Contractor discovers any conflict, error, ambiguity or discrepancy within the Contract Documents or between the Contract Documents and any provision of any such law or regulation applicable to the performance of the Work or of any such standard, specification, manual or code or of any instruction of any supplier, Contractor shall report it in writing at once to Inspector, with copies to Construction Manager and Architect, and Contractor shall not proceed with the Work affected thereby until consent to do so is given by the Construction Manager.
- C. Except as otherwise specifically stated in the Contract Documents or as may be provided by Change Order, or supplemental instruction, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity or discrepancy between the Contract Documents and:
 1. The provisions of any such standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or
 2. The provisions of any such laws or regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such law or regulation).

No provision of any such standard, specification, manual, code or instruction shall be effective to change the duties and responsibilities of CLPCCD, Contractor, Construction Manager, or Architect/Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents, nor shall it be effective to assign to CLPCCD, Architect/Engineer, Construction Manager, or any of their consultants, agents or employees any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

REFERENCES AND DEFINITIONS

SECTION 01 42 00

BID NO.: X/XX-XX CLPCCD DISTRICT TEMPLATE (REPLACE WITH BID NUMBER, PROJECT NUMBER AND NAME)

Division 1 General Requirements

1.03 STANDARDS

- A. ACI (American Concrete Institute)
Standard 318, Building Code Requirements for Reinforced Concrete
- B. AISC (American Institute of Steel Construction)
Specifications and Code of Standard Practice for Steel Buildings and Bridges
- C. ANSI (American National Standards Institute, formerly American Standards Association)
Standard C2, NESC (National Electrical Safety Code)
- D. ASTM (American Society for Testing and Materials)
 - 1. C31, Making and Curing Concrete Test Specimens in the Field
 - 2. C42, Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
 - 3. C143, Test Method for Slump of Portland Cement Concrete
- E. IAPMO (International Association of Plumbing and Mechanical Officials)
- F. ICC (International Code Council)
 - 1. Refer to Section 01 41 00 – Regulatory Requirements
- G. NEMA (National Electric Manufacturer's Association)
- H. NFPA (National Fire Protection Association)
 - 1. Pamphlet 1, Fire Prevention Code
 - 2. Pamphlet 13, Sprinkler Systems, Installation
 - 3. Pamphlet 24, Private Fire Service Mains
 - 4. Pamphlet 70, NEC (National Electric Code)
 - 5. Pamphlet 71, Signaling Systems, Central Station
 - 6. Pamphlet 80, Fire Doors and Windows
 - 7. Pamphlet 101, Life Safety Code
- I. UL (Underwriters' Laboratories, Inc.)

1.04 ABBREVIATIONS

- A. Following abbreviations may be used in Contract Documents:

AAP	Affirmative Action Program
ACI	American Concrete Institute
ADA	American Disabled Act
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute (formerly American Standards Association)
ASI	Architect's Supplemental Instructions
ASTM	American Society for Testing and Materials
BIL	Basic Insulation Level

REFERENCES AND DEFINITIONS

SECTION 01 42 00

BID NO.: X/XX-XX CLPCCD DISTRICT TEMPLATE (REPLACE WITH BID NUMBER, PROJECT NUMBER AND NAME)

Division 1 General Requirements

Cal/OSHA	California Occupational Safety and Health Administration
CCD	Construction Change Directive
CCR	California Code of Regulations
CFR	Code of Federal Regulations
CO	Change Order
CPUC	California Public Utilities Commission
CPM	Critical Path Method
DSA	Division of State Architect
HVAC	Heating, Ventilating and Air Conditioning
IAPMO	International Association of Plumbing and Mechanical Officials
ICBO	International Conference of Building Officials
I.D.	Identification
JATC	Joint Apprenticeship Training Committee
JV	Joint Venture
Kw	Kilowatt
LBE	Local Business Enterprise
MBE	Minority Business Enterprise
M/WBE	Minority and Woman-Owned Business Enterprise
ml	milliliter
mm	millimeter
NEC	National Electric Code
NEMA	National Electric Manufacturer's Association National Electrical Safety Code
NFPA	National Fire Protection Association
PM	Preventive Maintenance
PR	Proposal Request
RFI	Request for Information
RFS	Request for Substitution
SFM	State of California, Office of State Fire Marshal
CBC	California Building Code
CFC	California Fire Code
UL	Underwriters' Laboratories, Inc.
CMC	California Mechanical Code
CPC	California Plumbing Code
WOBE	Woman-Owned Business Enterprise
WMBE	Woman/Minority Business Enterprise

B. Additional abbreviations, used only on drawings, are listed thereon.

1.05 SYMBOLS

Symbols, used only on Drawings, are shown thereon.

1.06 DEFINITIONS

A. Wherever any of the words or phrases defined below, or a pronoun used in place thereof, is used in any part of the Contract Documents, it shall have the meaning here set forth:

ADDENDA: Written or graphic instruments issued prior to the opening of Bids, which clarify, correct or change the bidding requirements or the Contract Documents. Addenda shall not include the minutes of the Pre-bid Conference and Site Visit.

ADDITIVE BID: The sum to be added to the Base Bid if the change in scope of work as described in Additive Bid is accepted by CLPCCD.

REFERENCES AND DEFINITIONS

SECTION 01 42 00

BID NO.: X/XX-XX CLPCCD DISTRICT TEMPLATE (REPLACE WITH BID NUMBER, PROJECT NUMBER AND NAME)

Division 1 General Requirements

AGREEMENT: Agreement is the basic contract document that binds the parties to construction Work. Agreement defines relationships and obligations between CLPCCD and Contractor and by reference incorporates Conditions of Contract, Drawings, and Specifications and contains Addenda and all Modifications subsequent to execution of Contract.

ALTERNATE: Work added to or deducted from the Base Bid, if accepted by CLPCCD.

APPROVED EQUAL: Approved in writing by CLPCCD as being of equivalent quality, utility and appearance.

ARCHITECT or ARCHITECT/ENGINEER: The person holding a valid California State Architect's license, whose firm has been designated within the Contract Documents as the Architect to provide architectural services on the project. Refer to Section 341, Part 1, Title 24, C. C. R.

When the Architect is referred to within the Contract Documents and no Architect has in fact been designated, then the matter shall be referred to CLPCCD. The term Architect shall be construed to include all its consultants retained for the project, as well as employees of the Architect. When the designated Architect is an employee of CLPCCD, his authorized representations on the project within the district will be included under the term Architect.

BID: The offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

BIDDER: One who submits a Bid.

CLPCCD: Chabot-Las Positas Community College District. Unless otherwise expressly indicated or required by the context of usage, the terms "District" and "Owner" as used in the Contract Documents shall be deemed references to CLPCCD.

CLPCCD-FURNISHED, CONTRACTOR-INSTALLED: Items furnished by CLPCCD at its cost for installation by Contractor at its cost under this Contract.

CLPCCD REPRESENTATIVE(S): The person or persons assigned by CLPCCD to be CLPCCD's representatives or, if so designated, agent(s) at the site.

BY CLPCCD: Work that will be performed by CLPCCD or its agents at the CLPCCD's expense.

BY OTHERS: Work that is outside scope of Work to be performed by Contractor under this Contract, which will be performed by CLPCCD, other contractors, or other means.

CHANGE ORDER: A written instrument prepared by CLPCCD and signed by CLPCCD and Contractor, stating their agreement upon all of the following:

- a. a change in the Work,
- b. the amount of the adjustment in the Contract Sum, if any, and
- c. the amount of the adjustment in the Contract Time, if any.

As appropriate, change orders are subject to approval by the Division of the State Architect. Refer to section 4-338, Part 1, Title 24, California Code of Regulations.

CONCEALED: Work not exposed to view in the finished Work, including within or behind various construction elements.

CONTRACT CONDITIONS: Conditions of Contract define basic rights, responsibilities and relationships of Contractor and CLPCCD and consists of two parts: General Conditions and Supplementary Conditions.

- a. General Conditions are general clauses, which are common to the CLPCCD Contracts.
- b. Supplementary conditions modify or supplement General Conditions to meet specific requirements for this Contract.

CONSTRUCTION MANAGER: CLPCCD's authorized representative, who shall represent CLPCCD in all matters relative to this Contract. Construction Manager may authorize agents and representatives to act in carrying out Construction Manager's duties, including a "Project Manager", to act under the authority of the Construction Manager. As CLPCCD's agent, the Construction Manager is the beneficiary of all contract obligations of Contractor to CLPCCD, including without limitation, all releases and indemnities. Construction Manager shall not have any personal liability arising from this Contract or any activity there under and Contractor releases Construction Manager fully from all loss, cost, damage, expense or liability arising out of or connected with this Project, whether arising from contract, negligence or tort claims of all kinds.

CONTRACT DOCUMENTS: Contract Documents shall consist of the documents identified as the Contract Documents in Contract Agreement, plus all changes, addenda and modifications thereto.

CONTRACT MODIFICATION: Either:

- a. a written amendment to Contract signed by Contractor and CLPCCD; or
- b. a Change Order; or
- c. a written directive for a minor change in the Work issued by CLPCCD.

CONTRACT SUM: The sum stated in the Agreement and, including authorized adjustments, the total amount payable by CLPCCD to Contractor for performance of the Work and the Contract Documents. (Also referred to as the CONTRACT PRICE.)

CONTRACT TIMES: The number or numbers of days or the dates stated in the Agreement (i) to achieve substantial completion of the Work or designated milestones and/or (ii) to complete the Work so that it is ready for final payment and is accepted.

CONTRACTOR: The person or entity identified as such in the Agreement and referred to throughout the Contract Documents as if singular in number and neuter in gender. The term "Contractor" means the Contractor or its authorized representative.

CONTRACTOR'S EMPLOYEES: Persons engaged in execution of Work under Contract as direct employees of Contractor, as subcontractors, or as employees of subcontractors.

DATE OF SUBSTANTIAL COMPLETION: Date of Substantial Completion of Work or designated portion thereof is date certified by Construction Manager when construction is sufficiently complete in accordance with Contract Documents for CLPCCD to occupy Work or designated portion thereof for its use for which it is intended.

DAY: One calendar day, unless the word "day" is specifically modified to the contrary.

DEDUCTIVE BID: The sum to be subtracting to the Base Bid if the change in scope of work as described in Deductive Bid is accepted by CLPCCD.

DEFECTIVE: An adjective which, when modifying the word "Work", refers to Work that is unsatisfactory or unsuited for the use intended, faulty, or deficient, that it does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents (including but not limited to approval of samples and "or equal" items), or has been damaged prior to final payment (unless responsibility for the protection thereof has been assumed by CLPCCD). Construction Manager is the judge of whether Work is defective.

DRAWINGS: The graphic and pictorial portions of Contract Documents, wherever located and whenever issued, showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

ENGINEER: Where referenced in the Contract Documents, the person holding a valid California State Engineer's license, whose firm has been designated (if any designated) within the Contract Documents as the Engineer to provide engineering services on the project. Refer to section 4-341, Part 1, Title 24, C.C.R.

EQUAL: Equal in opinion of Architect. Burden of proof of equality is responsibility of Contractor.

EXPOSED: Work exposed to view in the finished Work, including behind louvers, grilles, registers and various other construction elements.

FINAL ACCEPTANCE or FINAL COMPLETION: All Work satisfactorily completed in accordance with Contract Documents. It includes, but is not limited to:

- a. All Systems having been tested and accepted as having met requirements of Contract Documents.
- b. All required instructions and training sessions having been given by Contractor.
- c. All as-built drawings and operations and maintenance manuals and Machine Inventory Sheets having been submitted by Contractor, reviewed by Architect/Engineer and accepted by CLPCCD.
- d. All punch list work, as directed by CLPCCD, having been completed by Contractor.
- e. Generally all work, except Contractor maintenance after Final Acceptance, having been completed to satisfaction of CLPCCD.

FORCE-ACCOUNT: Work directed to be performed without prior agreement as to lump sum or unit price cost thereof, and which is to be billed at cost for labor, materials, equipment, taxes, and other costs, plus a specified percentage for overhead and profit.

FURNISH: Supply only, do not install.

INDICATED: Shown or noted on the Drawings.

INSPECTOR: The person engaged by CLPCCD to inspect the workmanship, materials, or manner of construction of buildings or portions of buildings, to determine if such construction complies with the Contract Documents and applicable codes. The inspector is subject to

approval by the Architect, CLPCCD and, as appropriate, Division of the State Architect, and he will report to CLPCCD. Refer to section 4-333 and section 4-342, Part 1, Title 24, California Code of Regulations. The terms "Inspector" and "Project Inspector" are used interchangeably in the Contract Documents.

INSTALL: Install or apply only, do not furnish.

LATENT: Not apparent by reasonable inspection, including but not limited to, the inspections and research required as a condition to bidding under the General Conditions.

MATERIAL OR MATERIALS: These words shall be construed to embrace machinery, manufactured articles, materials of construction (fabricated or otherwise), and any other classes of material to be furnished in connection with Contract, except where a more limited meaning is indicated by context.

MILESTONE: A principal event specified in Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all Work.

MODIFICATION: Same as Contract Modification.

NOT IN CONTRACT: Work that is outside the scope of work to be performed by Contractor under this Contract.

NOTICE OF AWARD: A written notice given by CLPCCD to lowest responsive, responsible bidder advising that Bidder's bid and other qualifying information is acceptable to CLPCCD, requiring Bidder to fulfill the requirements of Article 1.03 of Document 00600 General Conditions.

NOTICE TO PROCEED: A written notice given by CLPCCD to Contractor fixing the date on which the Contract Time will commence to run and on which contractor shall start to perform Contractor's obligations under the Contract Documents.

OFF SITE: Outside geographical location of the Project.

OWNER: Chabot Las Positas Community College District (CLPCCD).

PROGRESS REPORT: a periodic report submitted by Contractor to CLPCCD with progress payment invoices accompanying actual work accomplished to the Project Schedule. See Section 01310 Progress Schedules and Reports, Document 00600 General Conditions.

PROJECT: Total construction of which Work performed under this Contract may be whole or part.

PROJECT MANUAL: Project Manual consists of Bidding Requirements, Agreement, Bonds, Certificates, Contract Conditions, and Specifications. The Project Manual is deemed to include and incorporate all matters noted in any Addenda issued by or on behalf of the District during the bidding for the Work.

PROJECT STABILIZATION AGREEMENT: The Contractor or Subcontractor (CONTRACTOR) on this project accepts and agrees to be bound by the terms and conditions of the "Chabot-Las Positas Project Stabilization Agreement", together with any and all amendments and supplements now existing or which are later made by executing the Letter of Assent.

REFERENCES AND DEFINITIONS

SECTION 01 42 00

BID NO.: X/XX-XX CLPCCD DISTRICT TEMPLATE (REPLACE WITH BID NUMBER, PROJECT NUMBER AND NAME)

Division 1 General Requirements

PROVIDE: Furnish and install.

REQUEST FOR INFORMATION (RFI): A document prepared by Contractor, CLPCCD or Architect/Engineer requesting information from one of the parties regarding the Project or Contract Documents. The RFI system is also a means for CLPCCD and Architect to submit Contract Document clarifications or supplements to Contractor.

RFI-REPLY: A document consisting of supplementary details, instructions or information issued by the Architect/Engineer, which clarifies or supplements Contract Documents and with which Contractor shall comply. RFI-Replies do not constitute changes in Contract Sum or Contract Times except as otherwise agreed in writing by CLPCCD. RFI-Replies will be issued through the RFI administrative system.

SAMPLES: Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

SHOP DRAWINGS: All drawings, diagrams, illustrations, schedules and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the work.

SHOWN: As indicated on Drawings.

SITE: The particular geographical location of Work performed pursuant to Contract, including staging areas, work areas, storage and lay down areas, access and parking.

SPECIFICATIONS: The written portion of the Contract Documents consisting of requirements for materials, equipment, construction systems, standards and workmanship for the Work, and performance of related services; and are contained in Divisions 1 through 32.

SPECIFIED: As written in Specifications.

SUBCONTRACTOR: A person or entity who has a direct contract with Contractor to perform a portion of the Work at the site. The term "subcontractor" is referred to throughout the Contract Documents as if singular in number and neuter in gender and means a subcontractor or an authorized representative of the subcontractor. The term "subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

SUBSTANTIAL COMPLETION: The Work (or a specified part thereof) has progressed to the point where, in the opinion of the Construction Manager and the Architect/Engineer as evidenced by a Certificate of Substantial Completion, it is sufficiently complete, in accordance with Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended; or if no such certificate is issued, when the Work is complete and ready for final payment is evidenced by written recommendation of the Construction Manager and the Architect/Engineer for final payment. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

SUPPLEMENTAL INSTRUCTION: A written work change directive to Contractor from Architect/Engineer, approved by Construction Manager, ordering alterations or modifications which do not result in change in Contract Sum or Contract Times, and do not substantially change Drawings or Specifications.

UNDERGROUND FACILITIES: All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: Electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.

VERIFIED REPORT: A periodic verified report submitted to DSA. Refer to sections 4-336, 4-337 and 4-343, Part 1, Title 24, California Code of Regulations.

WORK: The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work includes and is the result of performing or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all is required by the Contract Documents. Wherever the word "work" is used, rather than the word "Work", it shall be understood to have its ordinary and customary meaning.

- A. Wherever words "as directed", "as required", "as permitted", or words of like effect are used, it shall be understood that direction, requirements, or permission of CLPCCD or Construction Manager is intended. Words "sufficient", "necessary", "proper", and the like shall mean sufficient, necessary or proper in judgment of CLPCCD or Construction Manager. Words "approved", "acceptable", "satisfactory", "favorably reviewed" or words of like import, shall mean approved by, or acceptable to, or satisfactory to, or favorably reviewed by CLPCCD or Construction Manager.
- B. Wherever the word "may" is used, the action to which it refers is discretionary. Wherever the word "shall" is used, the action to which it refers is mandatory.

PART 2 – PRODUCTS

Not applicable.

PART 3 – EXECUTION

Not applicable.

END OF SECTION

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Quality assurance and control of installation.
- B. References.
- C. Mock-Up.
- D. Inspection and testing laboratory services.
- E. Manufacturer's field services.

1.02 RELATED SECTIONS

- A. Submission of manufacturers' instructions and
- B. Sections requiring Laboratory Testing:
 - 1. Section 01 33 00 - Submittals: certificates
 - 2. Section 31 00 00 - Earthwork
 - 3. Section 32 12 16 - Asphalt Concrete Paving
 - 4. Section 32 13 13 - Portland Cement Concrete Paving
 - 5. Section 03 20 00- Concrete Reinforcement
 - 6. Section 03 30 00 - Cast-in-Place Concrete
 - 7. Section 04 22 00 - Concrete Unit Masonry
 - 8. Section 05 12 00 - Structural Steel
 - 9. Section 05 50 10 - Metal Fabrications

1.03 QUALITY ASSURANCE AND CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply fully with manufacturers' instructions, including each step in sequence.
- C. If manufacturers' instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.04 REFERENCES

- A. Conform to reference standard by date of issue current on date specified in product sections.
- B. Should specified reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- C. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.05 MOCK-UP

- A. Mock-up and sample panels will be performed under various sections and identified as sample panels or mock-ups.
- B. Assemble and erect specified items with specified attachments, anchorage, flashing, seals and finishes.
- C. Where mock-up has been accepted by Architect/Engineer and is specified in product specification section to be removed, remove mock-up and clear area as directed.
- D. Whereas, mock-up submittals will be submitted until the acceptance by Architect/Engineer and Construction Manager.

1.06 INSPECTION AND TESTING LABORATORY SERVICES

- A. CLPCCD will appoint, employ and pay for services of an independent firm to perform inspection and testing.
- B. The independent firm will perform inspections, tests, and other services specified in individual specification sections and as required by the Architect/Engineer. Promptly notify Construction Manager, Architect/Engineer, DSA, Project Inspector, and Contractor of observed irregularities or deficiencies of work or products.
- C. Reports will be submitted by the independent firm, one copy each, to the Construction Manager, Architect, Engineer, Division of the State Architect, Contractor and Project Inspector. Indicate observations and results of tests and indicate compliance or non-compliance with Contract Documents and Title 24, C.C.R. specifically, each report will include the following:
 - 1. Date issued; date and time of sampling or inspection; date of test.
 - 2. Project title and number; testing laboratory name, address and telephone number; name and signature of laboratory inspector.
 - 3. Location of sampling or test; temperature and weather condition.
 - 4. Type of inspection or test; identification of product and specification section; results of test and compliance with Contract Documents and Title 24, C.C.R.
 - 5. Perform additional tests as required by Architect/Engineer and/or Project Inspector; interpret test results, when requested by Architect/Engineer.
 - 6. Special Inspections: as shown on attached Tests & Inspections (T&I) list for each section.

- D. Contractor shall cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage and assistance as requested.
1. Notify Architect/Engineer 72 hours in advance and/or independent firm 24 hours prior to expected time for operations requiring services.
 2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.
 3. Employment of the laboratory shall in no way relieve Contractor's obligations to perform the work of the contract.
- E. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Architect/Engineer and/or Project Inspector. Payment for retesting will be paid by the Contractor by deducting inspection or testing charges from the Contract Sum on the next scheduled payment.

1.07 MANUFACTURER'S FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, startup of equipment as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Construction Manager thirty (30) calendar days in advance of required observations. Observer shall be subject to approval of Construction Manager and Architect/Engineer.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- D. Refer to Section 01 33 00 - Submittals: Manufacturers' Instructions.

PART 2 – PRODUCTS

Not applicable to this section.

PART 3 – EXECUTION

Not applicable to this section.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

This section describes the temporary facilities required for the Project site. The Project site shall be maintained by Contractor as set forth in this section.

1.02 TEMPORARY FACILITIES

- A. Contractor shall obtain permits for, install and maintain in safe condition, whatever scaffolds, hoisting equipment, barricades, walkways, or other temporary structures, which may be required to accomplish the work on the Project. Contractor shall enclose and secure Project Site, including lay down area with a temporary chain link fence with site screen. Such structures shall be adequate for the intended use and capable of safely accepting all loads that may be imposed upon them. They shall be installed and maintained in accordance with all applicable State and local codes and regulations.
- B. Contractor shall provide and maintain temporary heat from an approved source whenever in the course of the Work it may become necessary for curing and drying of materials or to warm spaces as may be required for the installation of materials or finishes.
- C. Contractor shall provide and maintain any and all facilities that may be required for dewatering in order that work may proceed on the Project. If it is necessary for dewatering to occur continually, Contractor shall have on hand whatever spare parts or equipment that may be required to prevent interruption of dewatering.
- D. Contractor shall provide and maintain all utility services necessary to perform the work under this Contract. These may include, but are not limited to, temporary electricity, water, gas, sewer and telephone, including charges and installation fees. Contractor shall furnish and maintain all means of distribution of utility services required within the site to properly complete the Project.
- E. Materials, tools, accessories, etc., shall be stored only where directed by CLPCCD. Storage area shall be kept neat and clean. Security of stored items shall be Contractor's responsibility.
- F. When flammable materials are stored on site, extra precautions, including clear identification, shall be the responsibility of Contractor.
- G. Contractor shall provide and maintain temporary toilets in quantities and locations as required by CAL/OSHA and other local codes and regulations. They shall be maintained and supplied in a usable and sanitary condition at all times.
- H. If water at construction site is determined to be non-potable by Inspector, Contractor shall provide and maintain adequate potable water stations at site until final completion of the Project.
- I. Contractor shall maintain an office at the Project site, which will be his headquarters for the Project. Any communications delivered to this office shall be considered as delivered to Contractor. Location and size of office shall be such that it will adequately serve the needs of Contractor's superintendent and assistants in the performance of their duties.
- J. Contractor shall also provide and maintain the following temporary facilities for the duration of the project. Contractor shall obtain approval of the plans and specifications for all the following temporary facilities from Construction Manager prior to delivery to job site. Construction Manager shall have the option to reject said facilities if they do not meet Construction Manager's needs.
- K. Contractor shall promptly remove all such Temporary Facilities when they are no longer needed for the work or for completion of the Project, mutually agreed upon by Contractor and CLPCCD.
- L. Contractor shall provide and maintain in the Temporary Facilities a copy of the California Code of Regulations Title 24 (latest edition) Parts I & II.

1.03 SIGNS

No signs may be displayed on or about CLPCCD's property (except those required by law) without CLPCCD's specific approval; the size, content, and location to be as specified by CLPCCD.

1.04 USE OF ROADWAYS AND WALKWAYS

Contractor shall never block or interfere with use of any existing roadway, walkway or other facility for vehicular or pedestrian traffic, from any party entitled to use it. Wherever and whenever such interference becomes necessary for the proper and convenient performance of the Work, and no satisfactory detour route exists, Contractor shall, before beginning the interference, provide a satisfactory detour, including temporary bridge if necessary, or other proper facility for traffic to pass around or over the interference. Contractor shall maintain the detour in a safe and satisfactory condition as long as the interference continues, all without extra payment unless otherwise expressly stipulated in the Specifications.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION

SECTION 01 57 21

INDOOR AIR QUALITY CONTROLS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Construction procedures to promote adequate indoor air quality after construction.
- B. Building flush-out after construction and before occupancy.
- C. Testing indoor air quality after completion of construction.
- D. Testing air change effectiveness after completion of construction.

1.02 PROJECT GOALS

- A. See Section 01 33 28 "Healthy Building Design Requirements" for overall project goals relating to Wellness.
- B. See Section 01 33 29 "Sustainable Design Requirements" for overall project goals relating to environment and energy.
- C. Dust and Airborne Particulates: Prevent deposition of dust and other particulates in HVAC ducts and equipment.
 - 1. Cleaning of ductwork is not contemplated under this Contract.
 - 2. Contractor shall bear the cost of cleaning required due to failure to protect ducts and equipment from construction dust.
 - 3. Establish condition of existing ducts and equipment prior to start of alterations.
- D. Airborne Contaminants: Procedures and products have been specified to minimize indoor air pollutants.
 - 1. Furnish products meeting the specifications.
 - 2. Avoid construction practices that could result in contamination of installed products leading to indoor air pollution.

1.03 RELATED REQUIREMENTS

- A. Section 01 30 00 "Administrative Requirements."
- B. Section 01 33 28 "Healthy Building Design Requirements."
- C. Section 01 33 29 "Sustainable Design Requirements."
- D. Section 01 61 16 "Volatile Organic Compound (VOC) Content Restrictions."

- E. Section 23 40 00 "Air Cleaning:" HVAC filters.
- F. Section 23 05 93 "Testing, Adjusting, and Balancing:" Testing HVAC systems for proper air flow rates, adjustment of dampers and registers, and settings for equipment.

1.04 REFERENCE STANDARDS

- A. ASHRAE Std 52.2 - Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size; 2012, with 2015 amendments.
- B. ASHRAE Std 129 - Measuring Air-Change Effectiveness; 1997 (Reaffirmed 2002).
- C. ASTM D5149 - Standard Test Method for Ozone in the Atmosphere: Continuous Measurement by Ethylene Chemiluminescence; 2002 (Reapproved 2008).
- D. ASTM D5197 - Standard Test Method for Determination of Formaldehyde and Other Carbonyl Compounds in Air (Active Sampler Methodology); 2009.
- E. ASTM E77 - Standard Test Method for Inspection and Verification of Thermometers; 2014.
- F. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers; California Department of Public Health; v1.1, 2010.
- G. EPA 600/4-90/010 - Compendium of Methods for the Determination of Air Pollutants in indoor Air; April 1990.
- H. AWWA C707 - Encoder-Type Remote-Registration Systems for Cold-Water Meters; 2010.
- I. SMACNA (OCC) - IAQ Guidelines for Occupied Buildings Under Construction; 2007.

1.05 DEFINITIONS

- A. Adsorptive Materials: Gypsum board, acoustical ceiling tile and panels, carpet and carpet tile, fabrics, fibrous insulation, and other similar products.
- B. Contaminants: Gases, vapors, regulated pollutants, airborne mold and mildew, and the like, as specified.
- C. Particulates: Dust, dirt, and other airborne solid matter.
- D. Wet Work: Concrete, plaster, coatings, and other products that emit water vapor or volatile organic compounds during installation, drying, or curing.

1.06 SUBMITTALS

- A. See Section 01 30 00 "Administrative Requirements", for submittal procedures.

- B. Wellness Design Documentation: Submit all submittals required in this section in accordance with procedures specified in Section 01 33 28.
- C. Sustainable Design Documentation: Submit all submittals required in this section in accordance with procedures specified in Section 01 33 29.
- D. Indoor Air Quality Management Plan: Describe in detail measures to be taken to promote adequate indoor air quality upon completion; use SMACNA (OCC) as a guide.
 - 1. Submit not less than 60 days before enclosure of building.
 - 2. Identify potential sources of odor and dust.
 - 3. Identify construction activities likely to produce odor or dust.
 - 4. Identify areas of project potentially affected, especially occupied areas.
 - 5. Evaluate potential problems by severity and describe methods of control.
 - 6. Describe construction ventilation to be provided, including type and duration of ventilation, use of permanent HVAC systems, types of filters and schedule for replacement of filters.
 - 7. Describe cleaning and dust control procedures.
 - 8. Describe coordination with commissioning procedures.
- E. Interior Finishes Installation Schedule: Identify each interior finish that either generates odors, moisture, or vapors or is susceptible to adsorption of odors and vapors, and indicate air handling zone, sequence of application, and curing times.
- F. Duct and Terminal Unit Inspection Report.
- G. Air Contaminant Test Plan: Identify:
 - 1. Testing agency qualifications.
 - 2. Locations and scheduling of air sampling.
 - 3. Test procedures, in detail.
 - 4. Test instruments and apparatus.
 - 5. Sampling methods.
- H. Air Contaminant Test Reports: Show:
 - 1. Location where each sample was taken, and time.
 - 2. Test values for each air sample; average the values of each set of 3.
 - 3. HVAC operating conditions.
 - 4. Certification of test equipment calibration.
 - 5. Other conditions or discrepancies that might have influenced results.
- I. Ventilation Effectiveness Test Plan: Identify:
 - 1. Testing agency qualifications.
 - 2. Description of test spaces, including locations of air sampling.
 - 3. Test procedures, in detail; state whether tracer gas decay or step-up will be used.
 - 4. Test instruments and apparatus; identify tracer gas to be used.
 - 5. Sampling methods.
- J. Ventilation Effectiveness Test Reports: Show:
 - 1. Include preliminary tests of instruments and apparatus and of test spaces.
 - 2. Calculation of ventilation effectiveness, E.
 - 3. Location where each sample was taken, and time.
 - 4. Test values for each air sample.
 - 5. HVAC operating conditions.

6. Other information specified in ASHRAE Std 129.
7. Other conditions or discrepancies that might have influenced results.

1.07 QUALITY ASSURANCE

- A. Testing and Inspection Agency Qualifications: Independent testing agency having minimum of 5 years' experience in performing the types of testing specified.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Low VOC Materials: See Section 01 61 16 "VOC Content Restrictions."
- B. Low VOC Materials: See other sections for specific requirements for materials with low VOC content.
- C. Auxiliary Air Filters: MERV of 8, minimum, when tested in accordance with ASHRAE Std 52.2.

PART 3 - EXECUTION

3.01 CONSTRUCTION PROCEDURES

- A. Prevent the absorption of moisture and humidity by adsorptive materials by:
 1. Sequencing the delivery of such materials so that they are not present in the building until wet work is completed and dry.
 2. Delivery and storage of such materials in fully sealed moisture-impermeable packaging.
 3. Provide sufficient ventilation for drying within reasonable time frame.
- B. Begin construction ventilation when building is substantially enclosed.
- C. If extremely dusty or dirty work must be conducted inside the building, shut down HVAC systems for the duration; remove dust and dirt completely before restarting systems.
- D. When working in a portion of an occupied building, prevent movement of air from construction area to occupied area.
- E. Use of HVAC equipment and ductwork for ventilation during construction is not permitted:
 1. Provide temporary ventilation equivalent to 1.5 air changes per hour, minimum.
 2. Exhaust directly to outside.
 3. Seal HVAC air inlets and outlets immediately after duct installation.
- F. HVAC equipment and supply air ductwork may be used for ventilation during construction:
 1. Operate HVAC system on 100 percent outside air, with 1.5 air changes per hour, minimum.
 2. Ensure that air filters are correctly installed prior to starting use; replace filters when they lose efficiency.

3. Do not use return air ductwork for ventilation.
 4. Seal return air inlets or otherwise positively isolate return air system to prevent recirculation of air; provide alternate return air pathways.
- G. Do not store construction materials or waste in mechanical or electrical rooms.
- H. Prior to use of return air ductwork without intake filters clean up and remove dust and debris generated by construction activities.
1. Inspect duct intakes, return air grilles, and terminal units for dust.
 2. Clean plenum spaces, including top sides of lay-in ceilings, outsides of ducts, tops of pipes and conduit.
 3. Clean tops of doors and frames.
 4. Clean mechanical and electrical rooms, including tops of pipes, ducts, and conduit, equipment, and supports.
 5. Clean return plenums of air handling units.
 6. Remove intake filters last, after cleaning is complete.
- I. Do not perform dusty or dirty work after starting use of return air ducts without intake filters.
- J. Use other relevant recommendations of SMACNA (OCC) for avoiding unnecessary contamination due to construction procedures.

3.02 BUILDING FLUSH OUT

- A. Contractor's Option: Either full continuous flush-out OR satisfactory air contaminant testing is required, not both.
1. After construction ends, prior to occupancy and with all interior finishes installed, perform a building flush-out by supplying a total volume of 14,000 cubic feet of outdoor air per square foot of floor area.
 2. If occupancy is desired prior to flush-out completion, the space may be occupied following delivery of a minimum 3,500 cubic feet of outdoor air per square foot of floor area to the space. Once a space is occupied, it shall be ventilated at a minimum rate of 0.30 cfm per square foot of outside air or the design minimum outside air rate, whichever is greater. During each day of the flush-out period, ventilation shall begin a minimum of three hours prior to occupancy and continue during occupancy. These conditions shall be maintained until a total of 14,000 cubic feet of outdoor air per square foot has been delivered to that space.
- B. Perform building flush-out before occupancy.
- C. Do not start flush-out until:
1. All construction is complete.
 2. HVAC systems have been tested, adjusted, and balanced for proper operation.
 3. Inspection of inside of return air ducts and terminal units confirms that cleaning is not necessary.
 4. New HVAC filtration media have been installed.
- D. Building Flush-Out: Operate all ventilation systems at normal flow rates with 100 percent outside air until a total air volume of 14,000 cubic feet per square foot of floor area has been supplied.
1. Obtain Owner's concurrence that construction is complete enough before beginning flush-out.

2. Maintain interior temperature of at least 60 degrees F (15 degrees C) and interior relative humidity no higher than 60 percent.
 3. If additional construction involving materials that produce particulates or any of the specified contaminants is conducted during flush-out, start flush-out over.
- E. Install new HVAC filtration media after completion of flush-out and before occupancy or further testing.

3.03 AIR CONTAMINANT TESTING

- A. Contractor's Option: Either full continuous flush-out, or satisfactory air contaminant testing is required, not both.
- B. Perform air contaminant testing before occupancy.
- C. Do not start air contaminant testing until:
1. All construction is complete, including interior finishes.
 2. HVAC systems have been tested, adjusted, and balanced for proper operation.
 3. New HVAC filtration media have been installed.
- D. Indoor Air Samples: Collect from spaces representative of occupied areas:
1. Collect samples while operable windows and exterior doors are closed, HVAC system is running normally as if occupied, with design minimum outdoor air, but with the building unoccupied.
 2. Collect samples from spaces in each contiguous floor area in each air handler zone, but not less than one sample per 25,000 square feet; take samples from areas having the least ventilation and those having the greatest presumed source strength.
 3. Collect samples from height from 36 inches to 72 inches above floor.
 4. Collect samples from same locations on 3 consecutive days during normal business hours; average the results of each set of 3 samples.
 5. Exception: Areas with normal very high outside air ventilation rates, such as laboratories, do not need to be tested.
 6. When retesting the same building areas, take samples from at least the same locations as in first test.
- E. Outdoor Air Samples: Collect samples at outside air intake of each air handler at the same time as indoor samples are taken.
- F. Analyze air samples and submit report.
- G. Air Contaminant Concentration Limits:
1. Formaldehyde: Not more than 27 parts per billion.
 2. PM10 Particulates: Not more than 50 micrograms per cubic meter.
 3. PM2.5 Particulates: Not more than 15 micrograms per cubic meter.
 4. Ozone: Not more than 0.075 parts per million.
 5. Total Volatile Organic Compounds (TVOCs): Not more than 500 micrograms per cubic meter.
 6. Chemicals Listed in CAL (CDPH SM) Table 4-1, except Formaldehyde: Allowable concentrations listed in Table 4-1.

7. Carbon Monoxide: Not more than 9 parts per million and not more than 2 parts per million higher than outdoor air.

H. Air Contaminant Concentration Test Methods:

1. Formaldehyde: ASTM D5197, EPA 625/R-96/010b Method TO-11A, or EPA 600/4-90/010 Method IP-6.
2. Particulates: EPA 600/4-90/010 Method IP-10.
3. Ozone: ASTM D5149.
4. Total Volatile Organic Compounds (TVOC): EPA 625/R-96/010b Method TO-1, TO-15, or TO-17; or EPA 600/4-90/010 Method IP-1.
5. Chemicals Listed in CAL (CDPH SM) Table 4-1, except Formaldehyde: ASTM D5197, or EPA 625/R-96/010b Method TO-1, TO-15, or TO-17.
6. Carbon Monoxide: EPA 600/4-90/010 Method IP-3, plus measure outdoor air; measure in ppm; report both indoor and outdoor measurements.

END OF SECTION

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Products
- B. Transportation and handling.
- C. Storage and protection.

1.02 RELATED SECTIONS

- A. Section 01 11 00 - Summary of Work.
- B. Section 01 45 00 - Quality Control: Product Quality Monitoring.

1.03 PRODUCTS

- A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work.
- B. Provide interchangeable components of the same manufacturer, for similar components.

1.04 TRANSPORTATION AND HANDLING

- A. Transport and handle products in accordance with manufacturer's instructions and construction schedules. Coordinate to avoid conflict with work and conditions at the site.
- B. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.05 STORAGE AND PROTECTION

- A. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated products, place on sloped supports, above ground, to prevent soiling and staining.
- C. Provide off-site storage and protection when site does not permit on-site storage or protection.
- D. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.

MATERIAL AND EQUIPMENT

Section 01 61 00

- E. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- F. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- G. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.
- H. Provide substantial covering and protection after installation of products from damage due to traffic and subsequent construction operations. Remove when no longer needed.

PART 2-PRODUCTS

Not applicable to this section.

PART 3-EXECUTION

Not applicable to this section.

END OF SECTION

PART 1 – GENERAL

1.01 SUMMARY

- A. Procedures are described for selecting products and requesting substitutions of unlisted materials in lieu of materials named in the specifications or approved for use in addenda.
- B. Related Sections
 - 1. Section 01 26 00: Contract Modification Procedures
 - 2. Section 01 33 00: Submittals

1.02 CONTRACTOR'S OPTIONS

- A. For products specified only by reference standard: Select any product meeting that standard.
- B. For products specified by naming one or more products or manufacturers:
 - 1. Select products of any named manufacturer meeting specifications.
 - 2. For any product or manufacturer, which is not specifically named, submit Request for Substitution (RFS).
- C. For products indicated or specified by naming only one product and manufacturer, followed by the words “no substitution allowed”, there is no option.

1.03 SUBSTITUTIONS

- A. No substitutions shall be allowed for District standard systems, products, and/or materials unless approved in writing from the Architect's office five (5) days prior to bid. The entire District Standard systems, products, and/or materials can be found on the District's website at:

<http://www.clpccd.org/facilities/DistrictStandardsandGuidelines-ChabotCollege.php>
- B. Within a period of thirty-five (35) days after Award of Contract, Construction Manager and Architect/Engineer will consider RFS from Contractor. After that period, requests will be considered only when product becomes unavailable due to no fault of Contractor. Requests for review of proposed substitute items will not be accepted from anyone other than Contractor. The RFS will state the extent, if any, to which the evaluation and acceptance of the proposed substitute will prejudice Contractor's achievement of substantial completion on time, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with CLPCCD for work on the Project).
- C. Submit separate RFS for each product and support each request with:
 - 1. Product identification
 - 2. Manufacturer's literature
 - 3. Samples, as applicable

PRODUCT OPTIONS AND SUBSTITUTIONS

SECTION 01 62 00

4. Name and address of similar projects on which product has been used, and date of installation
 5. Name, address and telephone number of manufacturer's representative or sales engineer
 6. Where DSA approval is required, product shall be reviewed and approved by DSA
- D. Itemize a comparison of the proposed substitution with product specified and list significant variations. If variation from product specified is not pointed out in submittal, variation will be rejected even though submittal was favorably reviewed.
- E. State whether the substitute will require a change in any of the Contract documents (or provisions of any other direct contract with CLPCCD for work on the Project) to adapt the design of the proposed substitute, and whether or not incorporation or use of the substitute in connection with Work is subject to payment of any license fee or royalty. Submit data relating to changes in construction schedule.
- F. All variations of the proposed substitute from that specified will be identified in the RFS and available maintenance, repair and replacement service will be indicated.
- G. Include accurate cost data comparing proposed substitution with product and amount of net change in Contract price, including but not limited to, an itemized estimate of all costs or credits that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors effected by the resulting change, all of which will be considered by Construction Manager and Architect/Engineer in evaluating the proposed substitute. Construction Manager and Architect/Engineer may require Contractor to furnish additional data about the proposed substitute.
- H. Substitutions will not be considered for acceptance when:
1. They will result in delay meeting construction milestones or completion dates.
 2. Substitution of products results in an increase in costs resulting in a additional cost change order to the District
 3. They are indicated or implied on submittals without formal request from Contractor.
 4. They are requested directly by subcontractor or supplier.
 5. Acceptance will require substantial revision of Contract Documents.
 6. They disrupt Contractor's job rhythm or ability to perform efficiently.
- I. Substitute products shall not be ordered without written acceptance of Construction Manager and Architect/Engineer.
- J. Construction Manager and Architect/Engineer will determine acceptability of proposed substitutions and reserve right to reject proposals due to insufficient information.
- K. Accepted substitutions will be evidenced by a change order or Supplemental Instruction. All Contract requirements apply to Work involving substitutions.

1.04 CONTRACTOR'S REPRESENTATION AND WARRANTY

- A. Requests constitute a representation and warranty that Contractor:
1. Has investigated proposed product and determined that it meets or exceeds, in all respects, specified product
 2. Will provide the same warranty for substitution as for specified product
 3. Will coordinate installation and make other changes, which may be required for Work to be complete in all respects
 4. Waives claims for additional costs, which may subsequently become apparent
 5. Will compensate CLPCCD for additional redesign costs associated with substitution, if required
 6. Will be responsible for Construction Schedule slippage due to substitution
 7. Will be responsible for Construction Schedule delay due to late ordering of available specified products caused by requests for substitution, which is subsequently rejected by Construction Manager
 8. Will compensate CLPCCD for all costs; including extra costs of Contract, extra cost to other contractors, and any claims brought against CLPCCD, caused by late requests for substitutions or late ordering of products.

1.05 CONSTRUCTION MANAGER'S AND ARCHITECT/ENGINEER'S DUTIES

- A. Review Contractor's RFS within seven (7) working days.
- B. Notify Contractor in writing of decision to accept or reject requested substitution within seven (7) working days.

1.06 COST OF REVIEW

- A. Construction Manager and Engineer will record time required in evaluating substitutes proposed or submitted by Contractor. Whether or not Construction Manager or Architect/Engineer accepts the substitute item so proposed or submitted by Contractor, Contractor shall reimburse CLPCCD for the charges of Architect/Engineer and Construction Manager for evaluating each such proposed substitute item.
- B. The CLPCCD reserves the right to waive the requirement of paragraph A above.

PART 2--PRODUCTS

Not used.

PART 3--EXECUTION

Not used.

END OF SECTION

PRODUCT OPTIONS AND SUBSTITUTIONS

SECTION 01 62 00

PART 1 – GENERAL

1.01 SUMMARY

This section describes contract closeout procedures including:

1. Removal of temporary construction facilities
2. Substantial completion
3. Final completion
4. Final cleaning
5. Project record documents
6. Material, equipment and finish data
7. Project guarantee
8. Warranties
9. Turn-in
10. Release of claims
11. Guaranty and Maintenance Bonds

1.02 REMOVAL OF TEMPORARY CONSTRUCTION FACILITIES

- A. Remove temporary materials, equipment, services, and construction prior to Substantial Completion Inspection.
- B. Clean and repair damage caused by installation or use of temporary facilities.
- C. Restore permanent facilities used during construction to specified condition.

1.03 SUBSTANTIAL COMPLETION

- A. When Contractor considers Work or designated portion thereof as substantially complete, submit written notice, with list of items to be completed or corrected to Construction Manager.
- B. Within reasonable time, Construction Manager and Architect/Engineer will inspect to determine status of completion.
- C. Should Construction Manager or Architect/Engineer determine that Work is not substantially complete; Construction Manager will promptly notify Contractor in writing, listing all defects and omissions.
- D. Remedy deficiencies and send a second written notice of substantial completion. Architect/Engineer will reinspect the Work. If deficiencies previously noted are not corrected on reinspection, then Contractor shall pay the cost of the reinspection.
- E. When Architect/Engineer determines that Work is substantially complete, Construction Manager will issue a Certificate of Substantial Completion.
- F. Manufactured units, equipment and systems, which require startup, must have been started up and run for periods prescribed by Construction Manager, Architect/Engineer, or Owner before a Certificate of Substantial Completion will be issued.

1.04 FINAL COMPLETION

- A. When Contractor considers Work is complete, submit written certification that:

CONTRACT CLOSEOUT

SECTION 01 70 00

1. Contractor has inspected Work for compliance with Contract Documents.
 2. Work, except for Contractor maintenance after Final Acceptance, has been completed in accordance with Contract Documents and deficiencies listed with Certificate of Substantial Completion have been corrected.
 3. Work is complete and ready for final inspection.
 4. Contractor has achieved all requirements for Final Acceptance as that term is defined in Section 01 41 00 – Regulatory Requirements.
- B. In addition to submittals required by conditions of Contract, provide submittals required by governing authorities and submit final statement of accounting giving total adjusted Contract Sum, previous payments, and sum remaining due.
- C. When Architect/Engineer finds Work is acceptable and final submittal is complete, Construction Manager will issue final change order reflecting approved adjustments to Contract Sum not previously made by Change Order.

1.05 FINAL CLEANING

- A. Execute final cleaning prior to final inspection.
- B. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
1. Clean equipment and fixtures to a sanitary condition, clean or replace filters of mechanical equipment operated during construction, clean ducts, blowers and coils of units operated without filters during construction.
 2. Employ skilled workers for final cleaning.
- C. Clean Site; mechanically sweep-paved areas.
- D. Remove waste and surplus materials, rubbish, and construction facilities from Site.

1.06 PROJECT RECORD DOCUMENTS

- A. General
1. Project Record Documents required include:
 - a. Marked-up copies of Contract Drawings
 - b. Marked-up copies of Shop Drawings
 - c. Newly prepared Drawings
 - d. Marked-up copies of Specifications, Addenda and Change Orders
 - e. Marked-up Project Data submittals
 - f. Record Samples
 - g. Field records for variable and concealed conditions
 - h. Record information on Work that is recorded only schematically
 - i. Comments to all required DSA documentation
 - j. All approved change orders
 2. Specific Project Record Documents requirements that expand requirements of this Section are included in the individual Sections of Divisions 2 through 33.

CONTRACT CLOSEOUT

SECTION 01 70 00

3. Maintenance of Documents and Samples:
 - a. Store Project Record Documents and samples in the field office apart from Contract Documents used for construction.
 - b. Do not permit Project Record Documents to be used for construction purposes.
 - c. Maintain Project Record Documents in good order, and in a clean, dry, legible condition.
 - d. Make documents and samples available at all times for inspection by Architect/Engineer.
4. CLPCCD will provide one set of sepias and one blue-line set of the construction drawings and one-project manuals for the Contractor's use and copying during construction.

B. Project Record Drawings

1. Mark-up Procedure: During the construction period, maintain a set of blue-line or black-line prints of Contract Drawings and Shop Drawings for Project Record Document purposes.
2. Mark these Drawings to indicate the actual installation where the installation varies appreciably from the installation shown originally. Give particular attention to information on concealed elements, which would be difficult to identify or measure and record later. Items required to be marked include, but are not limited to:
 - a. Dimensional changes to the building
 - b. Drawings Revisions to details shown on the Contract Drawings
 - c. Drawings Depths of foundations below the first floor
 - d. Locations and depths of underground utilities
 - e. Revisions to routing of piping and conduits
 - f. Revisions to electrical circuitry
 - g. Actual equipment locations
 - h. Duct size and routing
 - i. Locations of concealed internal utilities
 - j. Changes made by Change Order
 - k. Details not on original Contract Drawings
3. Mark completely and accurately Project Record Drawing prints of Contract Drawings or Shop Drawings, whichever is the most capable of showing actual physical conditions. Where Shop Drawings are marked, show cross-reference on Contract Drawings location.
4. Mark Project Record Drawing sets with red erasable colored pencil; use other colors to distinguish between changes for different categories of the Work at the same location.
5. Mark important additional information, which was either shown schematically or omitted from original Drawings.
6. Note construction change directive numbers; alternate numbers; Change Order numbers and similar identification.
7. Responsibility for Mark-up: Where feasible, the individual or entity who obtained Project Record Drawing data, whether the individual or entity is the installer, subcontractor, or similar entity, is required to prepare the mark-up on Project Record Drawings.
 - a. Accurately record information in an understandable and legible drawing technique.

CONTRACT CLOSEOUT

SECTION 01 70 00

- b. Record data as soon as possible after it has been obtained. In the case of concealed installations, record and check the mark-up prior to concealment.
 8. At time of Substantial Completion, submit Project Record Drawings to Construction Manager for CLPCCD's records. Organize into sets, bind and label sets for CLPCCD's continued use.
 9. All record documents shall be submitted in an electronic format and hard copy.
- C. Preparation of Documents: Immediately prior to inspection for Certification of Substantial Completion, review completed marked-up Project Record Drawings with the Architect/Engineer. When authorized, prepare a full set of correct Contract Drawings and Shop Drawings.
 1. Incorporate changes and additional information previously marked on print sets. Erase, redraw, and add details and notations where applicable. Identify and date each Drawing; include the printed designation "PROJECT RECORD DRAWINGS" in a prominent location on each Drawing.
 2. Refer instances of uncertainty to the Architect/Engineer for resolution.
 3. Review of Documents: Before copying and distributing, submit corrected drawings and the original marked-up prints to the Architect/Engineer for review. When acceptable, the Architect/Engineer will initial and date each document, indicating acceptance of general scope of changes and additional information recorded, and of the quality of drafting.
 - a. Documents and the original marked-up prints will be returned to the Contractor for organizing into sets, printing, binding, and final submittal.
- D. Copies and Distribution: After completing the preparation of Project Record Drawings, print three (3) blue-line or black-line prints of each Drawing, whether or not changes and additional information were recorded. Organize the copies into manageable sets. Bind each set with durable paper cover sheets, with appropriate identification, including titles, dates and other information on cover sheets.
 1. Organize and bind original marked-up set of prints that were maintained during the construction period in the same manner.
 2. Organize Project Record Drawings into sets matching the print sets. Place these sets in durable tube-type drawing containers with end caps. Mark the end cap of each container with suitable identification.
 3. Submit the marked-up Project Record Drawings set and three (3) copy sets to the Construction Manager for CLPCCD's records; the Architect/Engineer will retain one copy set.

E. PROJECT RECORD SPECIFICATIONS

During the construction period, maintain one copy of the Project Specifications, including addenda and modifications issued, for Project Record Document purposes.

1. Mark the Project Record Specifications to indicate the actual installation where the installation varies substantially from that indicated in Specifications and Modifications issued. Note related Project Record Drawing information, where applicable. Give particular attention to substitutions, selection of product options, and information on concealed installation that would be difficult to identify or measure and record later.
 - a. In each Specification Section where products, materials or units of equipment are specified or scheduled, mark the copy with the proprietary name and model number of the product furnished.
 - b. Record the name of the manufacturer, supplier and installer, and other information necessary to provide a record of selections made and to document coordination with Project Record Product Data submittals and maintenance manuals.
 - c. Note related Project Record Product Data, where applicable, for each principal product specified,

CONTRACT CLOSEOUT

SECTION 01 70 00

indicate whether Project Record Product Data has been submitted in maintenance manual instead of submitted as Project Record Product Data.

2. Upon completion of mark-up, submit Project Record Specifications to the Construction Manager for CLPCCD's records.
- F. PROJECT RECORD PRODUCT DATA. During the construction period, maintain one copy of each Project Record Product Data submittal for Project Record Document purposes.
1. Mark Project Record Product Data to indicate the actual product installation where the installation varies substantially from that indicated in Project Record Product Data submitted. Include significant changes in the product delivered to the site, and changes in manufacturer's instructions and recommendations for installation.
 2. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 3. Note related Change Orders and mark-up of Project Record Drawings, where applicable.
 4. Upon completion of mark-up, submit a complete set of Project Record Product Data to the Construction Manager for CLPCCD's records.
 5. Where Project Record Product Data is required as part of maintenance manuals, submit marked-up Project Record Product Data as an insert in the manual, instead of submittal as Project Record Product Data.
 6. Each prime Contractor is responsible for mark-up and submittal of record Project Record Product Data for its own Work.
- G. MATERIAL, EQUIPMENT AND FINISH DATA.
1. Provide data for primary materials, equipment and finishes as required under each specification section.
 2. Submit two (2) sets prior to final inspection, bound in 8-1/2 inches by 11 inches three-ring binders with durable plastic covers; provide typewritten table of contents for each volume.
 3. Arrange by Specification division and give names, addresses, and telephone numbers of subcontractors and suppliers. List:
 - a. Trade names
 - b. Model or type numbers
 - c. Assembly diagrams
 - d. Operating instructions
 - e. Cleaning instructions
 - f. Maintenance instructions
 - g. Recommended spare parts
 - h. Product data
- H. FINAL AS-BUILT DRAWINGS, SPECIFICATIONS.
1. As-Built Drawings and Specifications are the official record drawing that documents what was constructed
 2. These drawings shall be available to the Architect and shall be provided to the District upon completion of the of the work.

CONTRACT CLOSEOUT

SECTION 01 70 00

3. Requirements:
 - a. One hard copy set of full size (24x36) or (36x48) As-Built Plans, with DSA App #, and "AS BUILT" stamped on each sheet in red.
 - b. One hard copy set of half size As-Built Plans, with DSA App #, and "AS BUILT" stamped on each sheet in red.
 - c. One hard copy set of specifications with "AS BUILT" stamped on the cover page in red.
 - d. A CD/DVD in PDF and CAD formats (CAD format to be compatible with AutoCAD 2016) with the following naming convention for the CD/DVD cover:
 - i. College Name
 - ii. Project Name
 - iii. DSA Application #
 - iv. Do not check the "read only" option
 - v. Do not password protect any files

1.08 MISCELLANEOUS PROJECT RECORD SUBMITTALS

Refer to other Specification Sections for miscellaneous record keeping requirements and submittals in connection with various construction activities. Immediately prior to Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for use and reference. Submit to the Construction Manager for CLPCCD's records.

Categories of requirements resulting in miscellaneous records include, but are not limited to the following:

- a. Field records on excavations and foundations
- b. Field records on underground construction and similar work
- c. Survey showing locations and elevations of underground lines
- d. Invert elevations of drainage piping
- e. Surveys establishing building lines and levels
- f. Authorized measurements utilizing unit prices or allowances
- g. Records of plant treatment
- h. Ambient and substrate condition tests
- i. Certifications received in lieu of labels on bulk products
- j. Batch mixing and bulk delivery records
- k. Testing and qualification of tradespersons
- l. Documented qualification of installation firms
- m. load and performance testing
- n. Inspections and certifications by governing authorities leakage and water-penetration tests
- o. Fire resistance and flame spread test results
- p. Final inspection and correction procedures

CONTRACT CLOSEOUT

SECTION 01 70 00

1.09 PROJECT GUARANTEE

- A. Neither recordation of final acceptance nor final certificate for neither payment nor provision of the Contract nor partial or entire use or occupancy of the Site by CLPCCD shall constitute acceptance of Work not done in accordance with Contract Documents nor relieve Contractor of liability in respect to express warranties or responsibility for faulty materials or workmanship.
- B. Requirements for Contractor's guarantee of completed Work are included in General Conditions, Article 1.09. Contractor shall guarantee Work done under Contract against failures, leaks or breaks or other unsatisfactory conditions due to defective equipment, materials or workmanship, and perform repair work or replacement required, at Contractor's sole expense, for period of 1 year from date of Final Acceptance, as required by paragraph 13.2 of General Conditions.
- C. CLPCCD may make repairs to defective Work as set forth in paragraph 12.6 of General Conditions, if, within 5 working days after mailing of written notice of defective work to Contractor or authorized agent, Contractor shall neglect to make or undertake with due diligence repairs; provided, however, that in case of leak or emergency where, in opinion of CLPCCD, delay would cause hazard to health or serious loss or damage, repairs may be made without notice being sent to Contractor, and Contractor shall pay cost thereof.
- D. If, after installation, operation or use of materials or equipment to be furnished under Contract proves to be unsatisfactory to Construction Manager, CLPCCD shall have right to operate and use materials or equipment until it can, without damage to CLPCCD, be taken out of service for correction or replacement. Period of use of defective materials or equipment pending correction or replacement shall in no way decrease guarantee period required for acceptable corrected or replaced items of materials or equipment.
- E. Nothing in this Section shall be construed to limit, relieve or release Contractor's, subcontractors' and equipment suppliers' liability to CLPCCD for damages sustained as result of latent defects in equipment caused by negligence of suppliers' agents, employees or subcontractors. Stated in another manner, warranty contained in the Contract Documents shall not amount to, nor shall it be deemed to be, waiver by CLPCCD of any rights or remedies (or time limits in which to enforce such rights or remedies) it may have for defective workmanship or defective materials under laws of this State pertaining to acts of negligence.

1.10 WARRANTIES AND BONDS

- A. Execute Contractor's submittals and assemble documents executed by subcontractors, suppliers, and manufacturers.
 - 1. Provide table of contents and assemble in 8-1/2 inches by 11 inches three-ring binder with durable plastic cover.
 - 2. Assemble in Specification Section order.
 - 3. Provide an electronic copy of all warranties on thumb drive in PDF format
- B. Submit material prior to final application for payment.
 - 1. For equipment put into use with CLPCCD's permission during construction, submit within ten (10) working days after first operation.
 - 2. For items of Work delayed materially beyond Date of Substantial Completion, provide updated submittal within ten (10) working days after acceptance, listing date of acceptance as start of warranty period.
- C. Warranties are intended to protect CLPCCD against failure of work and against deficient, defective and faulty materials and workmanship, regardless of sources.
- D. Limitations: Warranties are not intended to cover failures, which result from the following:
 - 1. Unusual or abnormal phenomena of the elements

CONTRACT CLOSEOUT

SECTION 01 70 00

2. Vandalism after substantial completion
3. Insurrection or acts of aggression including war
- E. Related Damages and Losses: Remove and replace Work which is damaged as result of defective Work, or which must be removed and replaced to provide access for correction of warranted Work.
- F. Warranty Reinstatement: After correction of warranted Work, reinstate warranty for corrected Work to date of original warranty expiration or to a date not less than 365 days after corrected Work was done, whichever is later.
- G. Replacement Cost: Replace or restore failing warranted items without regard to anticipated useful service lives.
- H. Warranty Forms: Submit drafts to Construction Manager for approval prior to execution. Forms shall not detract from or confuse requirements or interpretations of Contract Documents.
 1. Warranty shall be countersigned by manufacturers.
 2. Where specified, warranty shall be countersigned by subcontractors and installers.
- I. Rejection of Warranties: CLPCCD reserves right to reject unsolicited and coincidental product warranties, which detract from or confuse requirements or interpretations of Contract Documents.
- J. Term of Warranties: For materials, equipment, systems and workmanship warranty period shall be two (2) years minimum from date of substantial completion of entire Work except where:
 1. Detailed specifications for certain materials, equipment or systems require longer warranty periods.
 2. Materials, equipment or systems are put into beneficial use of CLPCCD prior to Substantial Completion as agreed to in writing by Construction Manager.
- K. Warranty of Title: No material, supplies, or equipment for Work under Contract shall be purchased subject to any chattel mortgage, security agreement, or under a conditional sale or other agreement by which an interest therein or any part thereof is retained by seller or supplier. Contractor warrants good title to all material, supplies, and equipment installed or incorporated in Work and agrees upon completion of all work to deliver the Site, together with improvements and appurtenances constructed or placed thereon by Contractor, to CLPCCD free from any claim, liens, security interest, or charges, and further agrees that neither Contractor nor any person, firm, or corporation furnishing any materials or labor for any Work covered by Contract shall have right to lien upon the Site or improvement or appurtenances thereon. Nothing contained in this Paragraph, however, shall defeat or impair right of persons furnishing materials or labor under bond given by Contractor for their protection or any rights under law permitting persons to look to funds due Contractor in hands of CLPCCD.

1.11 TURN-IN

Contract will not be closed out and final payment will not be made until all personnel Identification Media, vehicle permits and keys issued to Contractor during prosecution of Work are turned in to CLPCCD.

1.12 RELEASE OF CLAIMS

Contract will not be closed out and final payment will not be made until Contract Agreement and Release of Any and All Claims, is completed and executed by Contractor and CLPCCD.

1.13 FIRE INSPECTION COORDINATION

Contractor shall coordinate fire inspection and secure sufficient notice to CLPCCD to permit convenient scheduling.

CONTRACT CLOSEOUT

SECTION 01 70 00

BID NO.: XXX-XX CLPCCD DISTRICT TEMPLATE (REPLACE WITH BID NUMBER, PROJECT NUMBER AND NAME)

Division 1 General Requirements

HGA
PROJECT # 4952-002

06/05/2024
DSA SPC_V2

BUILDING 3000
MAINTENANCE OPERATIONS
WAREHOUSE & GARAGE
DSA 01-121159

PART 2 – PRODUCTS

Not applicable to this section.

PART 3 – EXECUTION

Not applicable to this section.

END OF SECTION

CONTRACT CLOSEOUT

SECTION 01 70 00

BID NO.: XXX-XX CLPCCD DISTRICT TEMPLATE (REPLACE WITH BID NUMBER, PROJECT NUMBER AND NAME)

Division 1 General Requirements

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION

- A. Work Included: This Section establishes general requirements pertaining to cutting, fitting, and patching of the work required to:
 - 1. Make the several parts fit properly.
 - 2. Uncover work to provide for installation, inspection, or both of ill-timed work.
 - 3. Remove and replace work not conforming to requirements of the Contract Documents.
 - 4. Remove and replace defective work.

1.3 QUALITY ASSURANCE

- A. Perform all cutting and patching in accordance with pertinent requirements of the specifications and in the event no such requirements are determined, in conformance with the Architect's written direction. In the absence of either of the previous, the work shall be completed as a minimum to industry standards for the given scope and project.
- B. In all cases, exercise extreme care in cutting operations and perform such operations under adequate supervision by competent mechanics skilled in the applicable trade. Openings shall be neatly cut and shall be kept as small as possible to avoid unnecessary damage. Careless and/or avoidable cutting damage, etc., will not be tolerated, and the Contractor will be held responsible for such avoidable or willful damage.
- C. All replacing, patching, and repairing of materials and surfaces cut or damaged in the execution of the work shall be performed by experienced mechanics of the several trades involved. Such replacing, repairing, and/or patching shall be done with the applicable materials, in such a manner that all surfaces so replaced, etc., will upon completion of the work, match the surrounding similar surfaces.

1.4 SUBMITTALS

- A. Request for the Architect's Consent:
 - 1. Prior to cutting which affects structural safety, submit a written request to the 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, notify the Architect and secure his written permission prior to proceeding.
- B. Notices to the Architect:

1. Submit written notice to the Architect and Construction Manager designating the time the work will be uncovered, therefore providing a time for the Architect's observation.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. For replacement of work removed, use materials which comply with the pertinent Section of these specifications. If materials are not covered within these documents, products and methods shall be provided and installed to match existing conditions.

2.2 CUTTING AND PATCHING

- A. Employ skilled and experienced installer to perform cutting and patching.
- B. Submit written request in advance of cutting or altering elements, which affects:
 1. Structural integrity of element.
 2. Integrity of weather-exposed or moisture-resistant elements.
 3. Efficiency, maintenance, or safety of element.
 4. Visual qualities of sight-exposed elements.
- C. Execute cutting, fitting, and patching including excavation and fill, to complete Work, and to:
 1. Fit the several parts together, to integrate with other Work.
 2. Uncover Work to install or correct ill-timed work.
 3. Remove and replace defective and non-conforming Work.
 4. Remove samples of installed Work for testing.
 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.
- D. Execute work by methods, which will avoid damage to other Work, and provide proper surfaces to receive patching and finishing.
- E. Cut rigid materials using masonry saw or core drill.
- F. Restore Work with new products in accordance with requirements of Contract Document.
- G. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- H. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.
- I. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.
- J. Identify any hazardous substance or condition exposed during the Work to the Architect for decision or remedy.

CUTTING AND PATCHING

PART 3 - EXECUTION

3.1 CONDITIONS

- A. Inspect existing conditions, including elements subject to movement or damage during cutting and patching.
- B. After uncovering the work, inspect conditions affecting installation of new work.

3.2 DISCREPANCIES

- A. If uncovered conditions are not as anticipated, immediately notify the Architect through the Construction Manager and secure needed directions.
- B. Do not proceed in areas of discrepancy until all such discrepancies have been fully resolved.

3.3 PREPARATION PRIOR TO CUTTING

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

3.4 PERFORMANCE

- A. Perform cutting and demolition by methods which will prevent damage to other portions of the work and will provide a proper surface to receive new installation or repair and new work. Perform fitting and adjustment of products to provide finished installation complying with the specified tolerance and finishes.

- END OF SECTION -

SECTION 01 74 19
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition and construction waste.
 - 2. Recycling nonhazardous demolition and construction waste.
 - 3. Disposing of nonhazardous demolition and construction waste.
- B. Related Requirements:
 - 1. Division 01 Sections.

1.03 DEFINITIONS

- A. Alternative Daily Cover (ADC): Material other than earthen material placed on the surface of the active face of a municipal solid waste landfill at the end of each operating day to control vectors, fires, odors, blowing litter, and scavenging. Note that materials that are used as ADC are not considered diverted from the landfill for LEED v4 and must be included in calculations as landfilled waste.
- B. Commingled Waste: Building waste streams that are combined on the project site and hauled away for sorting into recyclable streams. Note that for LEED v4, regardless of the number of materials that are separated out, commingled materials contribute to LEED as only one material stream.
- C. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- D. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations, excluding land-clearing debris and soil (see below).
- E. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- F. Land-Clearing Debris and Soil: Materials that are natural (e.g. rock, soil, stone, vegetation). Note that these are excluded from LEED waste management accounting. Materials that are man-made (e.g. concrete, brick, cement) are considered construction waste even if they were originally on the site.

- G. Material Stream: A flow of materials coming from a job site into markets for building materials.
- H. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for remanufacturing.
- I. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- J. Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.
- K. Waste Diversion: A management activity that disposes of waste through methods other than incineration or landfilling. Examples include reuse and recycling.
- L. Waste-To-Energy: The conversion of non-recyclable waste materials into usable heat, electricity, or fuel through variety of processes, including combustion, gasification, pyrolyzation, anaerobic digestion, and landfill gas (LFG) recovery. In LEED v4, to be considered diversion from landfill, the project team must follow the European Commission Waste Framework Directive 2009/98/EC and European Commission Waste Incineration Directive 2000/76/EC. In addition, the waste-to-energy facility must meet the applicable European Committee for Standardization (CEN) EN 303 standards, based on the fuel type.

1.04 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Project rates for salvage/recycling of 50 percent by weight of total non-hazardous solid waste generated by the Work. Diverted materials must include a minimum of three material streams. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials, including, but not limited to, the following:

- 1. Demolition Waste:
 - a. Asphalt paving
 - b. Concrete
 - c. Concrete reinforcing steel
 - d. Brick
 - e. Concrete masonry units
 - f. Wood studs
 - g. Wood joists
 - h. Plywood and oriented strand board
 - i. Wood paneling
 - j. Wood trim
 - k. Structural and miscellaneous steel
 - l. Rough hardware
 - m. Roofing
 - n. Insulation
 - o. Doors and frames
 - p. Door hardware
 - q. Windows
 - r. Glazing
 - s. Metal studs

- t. Gypsum board
- u. Acoustical tile and panels
- v. Carpet
- w. Carpet pad
- x. Demountable partitions
- y. Equipment
- z. Cabinets
- aa. Plumbing fixtures
- bb. Piping
- cc. Supports and hangers
- dd. Valves
- ee. Sprinklers
- ff. Mechanical equipment
- gg. Refrigerants
- hh. Electrical conduit
- ii. Copper wiring
- jj. Lighting fixtures
- kk. Lamps
- ll. Ballasts
- mm. Electrical devices
- nn. Switchgear and panelboards
- oo. Transformers

2. Construction Waste:

- a. Masonry and CMU
- b. Lumber
- c. Wood sheet materials
- d. Wood trim
- e. Metals
- f. Roofing
- g. Insulation
- h. Carpet and pad
- i. Gypsum board
- j. Piping
- k. Electrical conduit
- l. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
 - 1) Paper
 - 2) Cardboard
 - 3) Boxes
 - 4) Plastic sheet and film
 - 5) Polystyrene packaging
 - 6) Wood crates
 - 7) Plastic pails

1.05 ACTION SUBMITTALS

- A. Construction and Demolition Waste Management Plan: Submit LEED-compliant plan within 30 days of date established for the Notice to Proceed. This plan must be submitted regardless of project goals for diversion.

1.06 INFORMATIONAL SUBMITTALS

- A. Waste Reduction Progress Reports: Submit report to LEED consultant on a monthly basis.
 - 1. Material category
 - 2. Generation point of waste
 - 3. Identify diverted waste material stream
 - 4. Total quantity of waste in tons
 - 5. Quantity of waste salvaged, both estimated and actual in tons
 - 6. Quantity of waste recycled, both estimated and actual in tons
 - 7. Total quantity of waste recovered (salvaged plus recycled) in tons
 - 8. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste
- B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- C. Record of materials removed from new building site and reused on owners or other property.
- D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- E. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- F. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices. Note that commingled materials contribute to credit requirements as a single material stream only, and that visual approximation is not an acceptable method of calculating commingled load content. Commingled materials must be either individually weighed or documented with a compliant facility-level accounting methodology.
- G. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- H. LEED Submittal: LEED letter template for Construction and Demolition Waste Management Planning and Construction and Demolition Waste Management, signed by Contractor, tabulating total waste material, quantities diverted and means by which it is diverted, and statement that requirements for the credit have been met.
- I. Waste-to-Energy Records: Indicate receipt and acceptance of waste diverted to a waste-to-energy facility that follows the European Commission Waste Framework Directive 2009/98/EC and Waste Incineration Directive 2000/76/EC and meets the applicable European Committee for Standardization (CEN) EN 303 standards.

1.07 QUALITY ASSURANCE

- A. Waste Management Coordinator Qualifications: Experienced firm, with a record of successful waste management coordination of projects with similar requirements. Waste management coordinator may also serve as LEED coordinator.

- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:
 - 1. Review and discuss waste management plan including responsibilities of waste management coordinator.
 - 2. Review requirements for documenting quantities of each type of waste and its disposition.
 - 3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - 4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - 5. Review waste management requirements for each trade.

1.08 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of waste generated by the Work. Include estimated quantities and assumptions for estimates. Identify a diversion rate goal and a minimum of five waste streams as part of Construction and Demolition Waste Planning.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, waste diversion, and handling and transportation procedures.
 - 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
 - 2. Salvaged Materials for Reuse by Owner: For materials that will be salvaged and reused by owner on another project or on Owner property, describe methods for preparing salvaged materials before incorporation into the Work.
 - 3. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - 4. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - 5. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
 - 6. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
 - 7. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 - 1. Comply with operation, termination, and removal requirements in Division 01 Section 01 50 00 "Temporary Facilities and Controls."
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan.
- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
 - 1. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 - 2. Comply with Division 01 Section 01 50 00 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.02 RECYCLING WASTE, GENERAL

- A. General: Household recyclables such as cans, bottles, paper, plastic containers.
- B. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
 - 1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.

2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

3.03 RECYCLING DEMOLITION WASTE [DELETE IF NO DEMO]

- A. Asphalt Paving: Break up and transport to recycling facility.
- B. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
 1. Break up and transport to recycling facility.
- C. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
 1. Transport to recycling facility.
- D. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- E. Metals: Separate metals by type.
 1. Structural Steel: Stack members according to size, type of member, and length.
 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- F. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.
- G. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
- H. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
- I. Metal Suspension System: Separate metal members including trim, and other metals from acoustical panels and tile and sort with other metals.
- J. Carpet: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
 1. Store clean, dry carpet in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- K. Carpet Tile: Remove debris, trash, and adhesive.
 1. Stack tile on pallet and store clean, dry carpet in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- L. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.

M. Conduit: Reduce conduit to straight lengths and store by type and size.

3.04 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
2. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
3. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
4. Alternative Daily Cover (ADC): Does not qualify as material diverted from disposal and does not contribute to waste diversion, but must be included in waste accounting.
5. Land-Clearing Debris: Is not considered construction, demolition, or renovation waste that can contribute to waste diversion. It is excluded from project waste accounting.

B. Wood Materials: Separate lumber, engineered wood products, panel products, and treated wood materials.

C. Masonry: Remove metal reinforcement, anchors, and ties from masonry.

1. Transport to recycling facility.

D. Metals: Separate metals by type.

1. Structural Steel
2. Remove and dispose of bolts, nuts, washers, and other rough hardware.

E. Gypsum Board:

1. Clean Gypsum Board:
 - a. Comply with requirements in Division 32 Section "Plants" for use of clean ground gypsum board as inorganic soil amendment.

3.05 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Disposal: Remove waste materials from Owner's property and legally dispose of them.

HGA
PROJECT # 4952-002

06/05/2024
DSA SPC_V2

BUILDING 3000
MAINTENANCE OPERATIONS
WAREHOUSE & GARAGE
DSA 01-121159

END OF SECTION 01 74 19

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Administrative and procedural requirements for Project Record Documents.
- B. Project Record Documents required include:
 - 1. Marked-up copies of Drawings
 - 2. Marked-up copies of Shop Drawings
 - 3. Newly prepared Drawings
 - 4. Marked-up copies of Specifications, Addenda, Change Orders and CCDs
 - 5. Marked-up Product Data submittals
 - 6. Record Samples
 - 7. Field records for variable and concealed conditions
 - 8. Record information on Work that is recorded only schematically
 - 9. Maintenance forms for major equipment
- C. Specific Project Record Documents requirements that expand requirements of this Section are included in the individual Sections of Divisions 2 through 33.
- D. General Project closeout requirements are included in Section 01 70 00 (Contract Closeout).
- E. Maintenance of Documents and Samples:
 - 1. Store Project Record Documents and Samples in the field office apart from Contract Documents used for construction.
 - 2. Do not permit Project Record Documents to be used for construction purposes.
 - 3. Maintain Project Record Documents in good order and in a clean, dry, legible condition.
 - 4. Make Documents and Samples available at all times for inspection by District.
- F. District will provide one full size blueline set of the Drawings and one Project Manual for Contractor's use for recording as-built conditions.

1.02 PROJECT RECORD DRAWINGS

- A. Mark-up Procedure: During the construction period, maintain a set of blueline or blackline prints of Contract Drawings and Shop Drawings for Project Record Documents purposes. Label each document (on first sheet or format page) "PROJECT RECORD" in 2-inch high printed letters. Keep record documents current. Note: A reference by number to a Change Order, CCD, RFI, RFQ, RFP, Field Order or other such document is not acceptable as sufficient record information on any record document. Do not permanently conceal any Work until required information has been recorded.
 - 1. Mark these Drawings to indicate the actual installation where the installation varies appreciably from the installation shown originally. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later. Items required to be marked include but are not limited to:
 - a. Dimensional changes to the Drawings
 - b. Revisions to details shown on the Drawings
 - c. Depths of various elements of foundation in relation to main floor level or survey datum
 - d. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements
 - e. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure
 - f. Locations of underground work, points of connection with existing utilities, changes in direction, valves, manholes, catch basins, capped stub outs, invert elevations, and similar items
 - g. Actual numbering of each electrical circuit

PROJECT RECORD DOCUMENTS

SECTION 01 78 00

- h. Field changes of dimension and detail
 - i. Revisions to routing of piping and conduits
 - j. Revisions to electrical circuitry
 - k. Actual equipment locations
 - l. Duct size and routing
 - m. Changes made by Change Order or CCD
 - n. Details not on original Contract Drawings
2. Mark completely and accurately Project Record Drawing prints of Contract Drawings or Shop Drawings, whichever is the most capable of showing actual physical conditions. Where Shop Drawings are marked, show cross-reference on Contract Drawings location.
 3. Mark Project Record Drawing sets with red, erasable colored pencil; use other colors to distinguish between changes for different categories of the Work at the same location.
 4. Mark important additional information that was either shown schematically or omitted from original Drawings.
 5. Note CCD numbers; alternate numbers, Change Order numbers, and similar identification.
 6. Responsibility for Mark-up: Where feasible, the individual or entity who obtained Project Record Drawing data, whether the individual or entity is the installer, Subcontractor, or similar entity, is required to prepare the mark-up on Project Record Drawings.
 - a. Accurately record information in an understandable and legible drawing technique.
 - b. Record data as soon as possible after it has been obtained. In the case of concealed installations, record and check the mark-up prior to concealment.
- B. Preparation of Record Drawings: Immediately prior to inspection for Certification of Substantial Completion, review completed marked-up Project Record Drawings with District. When authorized, prepare a full set of correct transparencies of Contract Drawings and Shop Drawings.
1. Incorporate changes and additional information previously marked on print sets. Erase, redraw, and add details and notations where applicable. Identify and date each Drawing; include the printed designation "PROJECT RECORD DRAWING" in a prominent location on each Drawing.
 2. Refer instances of uncertainty to District for resolution.
 3. Distribution: Whether or not changes and additional information were recorded, organize and bind original marked-up set of prints that were maintained during the construction period into manageable sets. Bind the set with durable paper cover sheets, with appropriate identification, including titles, dates, and other information on cover sheets.
- C. Distribution of Marked-Up Drawings: Submit three full, bound sets and one digital set in AutoCAD 2016 format, the marked-up Project Record Drawings set to District for District's records.
- D. Shop Drawings and Samples: Maintain as record documents; legibly annotate Shop Drawings and Samples to record changes made after review.
- E. In addition to requirements of this Section, comply with supplemental requirements of Divisions 15 and 16.
1. Divisions 15 and 16 of the Specifications require the preparation of large scale, detailed layout drawings of the Work of those Divisions. These layout drawings are not Shop Drawings as defined by General Conditions, but together with Shop Drawings or layout drawings of all other affected Sections are used to check, coordinate, and integrate the work of the various Sections.
 2. Include these layout drawings as part of the Project Record Documents.

1.03 PROJECT RECORD SPECIFICATIONS

- A. During the construction period, maintain one copy of the Project Specifications, including addenda and modifications issued, for Project Record Documents purposes.
- B. Mark the Project Record Specifications to indicate the actual installation where the installation varies substantially from that indicated in Specifications and Modifications issued. Note related Project Record Drawing information, where applicable. Give particular attention to substitutions, selection of

product options, Change Order and Construction Change Directive work, and information on concealed installation that would be difficult to identify or measure and record later.

1. In each Specification Section where products, materials or units of equipment are specified or scheduled, mark the copy with the proprietary name and model number of the product furnished.
2. Record the name of the manufacturer, catalog number, supplier and installer, and other information necessary to provide a record of selections made and to document coordination with Project Record Product Data submittals and maintenance manuals.
3. Note related Project Record Product Data, where applicable, for each principal product specified, indicate whether Project Record Product Data has been submitted in maintenance manual instead of submitted as Project Record Product Data.
4. Upon completion of mark-up, submit Project Record Specifications to District for District's records.

1.04 ADDITIONAL REQUIREMENTS FOR FINAL PROJECT RECORD DOCUMENTS

- A. Prior to Substantial Completion of the Work, District will make available to Contractor originals of the Drawings and Specifications, as Microsoft® Word for Windows, and AutoCAD 2016 Land Development Desktop for Windows in drawing format (.DWG) files. Note all changes thereon for the final Project Record Documents and provide one set of mylar reproducibles, one set of revised Specifications and one set of disks or CDs to be submitted to District.
- B. After Substantial Completion and before Final Completion, carefully transfer all data shown on the job set of Record Drawings to the corresponding computer files, coordinating the information as required.
- C. Clearly indicate at each affected detail and other drawings a full description of changes made during construction, and the actual location of items as previously specified.
- D. "Cloud" all affected areas.
- E. Stamp each Record Drawing with the following information:
 1. Project Record Document.
 2. Prepared by: Contractor's name, permanent address.
 3. Date prepared.
 4. Contractor's signature.
 5. District Contract Number.

1.05 PROJECT RECORD PRODUCT DATA

- A. During the construction period, maintain one copy of each Project Record Product Data submittal for Project Record Document purposes.
 1. Mark Project Record Product Data to indicate the actual product installation where the installation varies substantially from that indicated in Project Record Product Data submitted. Include significant changes in the product delivered to the Site, and changes in manufacturer's instructions and recommendations for installation.
 2. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 3. Note related Change Orders and mark-up of Project Record Drawings, where applicable.
 4. Upon completion of mark-up, submit a complete set of Project Record Product Data to District for District's records.
 5. Where Project Record Product Data is required as part of maintenance manuals, submit marked-up Project Record Product Data as an insert in the manual, instead of submittal as Project Record Product Data.
 6. Contractor is responsible for mark-up and submittal of Project Record Product Data for its own Work.
- B. Material, Equipment, and Finish Data:
 1. Provide data for primary materials, equipment and finishes as required under each Specification Section.

PROJECT RECORD DOCUMENTS

SECTION 01 78 00

2. Submit three (3) hard copy sets and one (1) digital copy, on compact disc (CD) prior to final inspection, bound in 8-1/2 inches by 11 inches three-ring binders with durable plastic covers; provide typewritten table of contents for each volume.
3. Arrange by Specification Section number and give names, addresses, and telephone numbers of Subcontractors and suppliers. List:
 - a. Trade names.
 - b. Model or type numbers.
 - c. Assembly diagrams.
 - d. Operating instructions.
 - e. Cleaning instructions.
 - f. Maintenance instructions.
 - g. Recommended spare parts.
 - h. Product data.

1.06 MISCELLANEOUS PROJECT RECORD SUBMITTALS

- A. Refer to other Specification Sections for miscellaneous record keeping requirements and submittals in connection with various construction activities. Immediately prior to Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for use and reference. Submit to the District for District's records. Categories of requirements resulting in miscellaneous records include, but are not limited to, the following:
1. Field records on excavations and foundations
 2. Field records on underground construction and similar work
 3. Survey showing locations and elevations of underground lines
 4. Invert elevations of drainage piping
 5. Surveys establishing building lines and levels
 6. Authorized measurements utilizing unit prices or allowances
 7. Records of plant treatment
 8. Ambient and substrate condition tests
 9. Certifications received in lieu of labels on bulk products
 10. Batch mixing and bulk delivery records
 11. Testing and qualification of tradespersons
 12. Documented qualification of installation firms
 13. Load and performance testing
 14. Inspections and certifications by governing authorities
 15. Leakage and water-penetration tests
 16. Fire resistance and flame spread test results
 17. Final inspection and correction procedures
 18. Final As-Built Construction Schedule

PART 2 PRODUCTS

NOT APPLICABLE TO THIS SECTION.

PART 3 EXECUTION

3.01 RECORDING

Post changes and modifications to the Contract Documents as they occur. Do not wait until the end of the Project. District may periodically review Project Record Documents to assure compliance with this requirement.

PROJECT RECORD DOCUMENTS

SECTION 01 78 00

3.02 SUBMITTAL

- A. At completion of Project, deliver Project Record Documents to District.
- B. Accompany submittal with transmittal letter containing:
 - 1. Date
 - 2. Project title and number
 - 3. Contractor's name and address
 - 4. Number and title of each Project Record Document
 - 5. Certification that each document as submitted is complete and accurate, and signature of Contractor or Contractor's authorized representative.

END OF SECTION

SECTION 01 81 13

SUSTAINABLE DESIGN REQUIREMENTS – LEED v4 BD+C

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes general requirements and procedures for compliance with certain prerequisites and credits needed for Project to obtain "LEED Version 4 for Building Design and Construction" (LEED v4 BD+C) Silver certification based on USGBC's LEED v4 BD+C.
1. This project has been designed to achieve a minimum LEED Silver (minimum 50 points) certification as defined in USGBC LEED v4 BD+C for New Construction.
 2. LEED v4.1 requirements were substituted for the following credits: MR credits Environmental Product Declarations, Sourcing of Raw Materials, and Material Ingredients, and EQ credits Low Emitting Materials.
 3. Specific requirements for LEED are also included in other Sections.
 4. Some LEED prerequisites and credits needed to obtain LEED certification depend on product selections and may not be specifically identified as LEED requirements. Compliance with requirements needed to obtain LEED prerequisites and credits may be used as one criterion to evaluate substitution requests and comparable product requests. Free-standing furniture and furnishings are included in the Contract.
 5. A Sustainable Design Consultant has been employed by Owner to review sustainable design documentation, in addition to review of those submittals by Architect.
 6. Contractor is not responsible for the application for certification, nor for determination of methods of achieving sustainable design credits unless specifically so indicated.
 7. Many of the sustainable design credits can be achieved only through intelligent design of the project and are beyond the control of the Contractor. However, certain credits relate to the products and procedures used for construction. Therefore, the full cooperation of the Contractor and subcontractors is essential to achieving final certification.
 8. Contractor shall familiarize him/herself with the relevant requirements and provide the necessary information and instruction to all subcontractors and installers.
 9. Since Contractor and subcontractors may not be familiar with sustainable design requirements, this section includes a summary of the products and procedures intended to achieve sustainable design credits.
 - a. Some credits are dependent on proper performance by Contractor and subcontractors.
 - b. Other credits involve quantifying percentages by weight or volume and cost; these require careful recordkeeping and reporting by the Contractor.
 - c. See www.usgbc.org for more information.
 10. If retaining first subparagraph below, attach a copy of the LEED checklist to the end of this Section as information for Contractor.
 11. A copy of the LEED Project checklist is attached at the end of this Section for information only.

1.02 RELATED REQUIREMENTS

- A. Section 00 60 00 "LEED and WELL Materials Reporting Form"
- B. Section 01 57 21 "Indoor Air Quality Controls"
- C. Section 01 61 16 "Volatile Organic Compound (VOC) Content Restrictions"
- D. Section 01 74 19 "Construction Waste Management and Disposal"

1.03 REFERENCE STANDARDS

- A. USGBC LEED v4 BD+C – LEED v4 for Building Design and Construction

1.04 DEFINITIONS

- A. Adequate Ventilation: Ventilation, including air circulation and air changes, required to cure materials, dissipate humidity, and prevent accumulation of dust, fumes, vapors and gases
- B. Biobased Material: commercial or industrial products (other than food or feed) that are composed in whole, or in significant part, of biological products, renewable agricultural materials (including plant, animal, and marine materials), or forestry materials. For the purposes of LEED, this excludes leather and other animal hides.
 - 1. Biobased content: The amount of biobased carbon in the material or product as a percentage of weight (mass) of the total organic carbon in the material or product.
- C. Building Exterior: a structure's primary and secondary weatherproofing system, including waterproofing membrane and air- and water-resistant barrier materials, and all building elements outside that system.
- D. Building Interior: everything inside a structure's weatherproofing membrane.
- E. California Department of Public Health Standard v1.1-2010 (CDPH SM): Standard method for the testing and evaluation of volatile organic chemical emissions from indoor sources using environmental chambers, emission testing method for California specification 01350.
- F. CARB (ATCM): Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products; California Air Resources Board; current edition
- G. Chain-of-Custody (CoC): a procedure that tracks a product from the point of harvest or extraction to its end use, including all successive stages of processing, transformation, manufacturing, and distribution.
- H. Chain-of-Custody Certificates: certificates signed by manufacturers certifying that wood used to make products was obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001. Certificates shall include evidence that manufacturer is certified for chain of custody by an FSC-accredited certification body.

- I. Cradle-to-Gate Assessment: analysis of a product's partial life cycle, from resource extraction (cradle) to the factory gate (before it is transported for distribution and sale). It omits the use and the disposal phases of the product.
- J. Enclosure: the exterior plus semi-exterior portions of the building. Exterior consists of the elements of a building that separate conditioned spaces from the outside (i.e., the wall assembly). Semi-exterior consists of the elements of a building that separate conditioned space from unconditioned space or that encloses semi-heated space through which thermal energy may be transferred to or from the exterior or conditioned or unconditioned spaces (e.g., attic, crawl space, basement, etc.).
- K. Environmental Product Declaration: a verified document that reports environmental data of products based on life cycle assessment (LCA) and other relevant information and in accordance with the international standard ISO 14025 (Type III Environmental Declarations).
- L. Extended Producer Responsibility: measures undertaken by the maker of a product to accept its own and sometimes other manufacturers' products as postconsumer waste at the end of the products' useful life. Producers recover and recycle the materials for use in new products of the same type. To count toward credit compliance, a program must be widely available. For carpet, extended producer responsibility must be consistent with NSF/ANSI 140-2007. Also known as closed-loop program or product take-back.
- M. Health Product Declaration (HPD): A standard format for reporting product content and associated health information for building products and materials, overseen by the non-profit Health Product Declaration Collaborative.
- N. Interior Final Finishes: Materials and products that will be exposed at interior occupied spaces, including flooring, wall covering, finish carpentry, and ceilings.
- O. LEED®: Leadership in Energy and Environmental Design, Building Design and Construction Rating System (BD+C) for New Construction (NC)
 - 1. Definitions that are a part of "LEED Version 4 for Building Design and Construction" (LEED v4 BD+C) apply to this Section.
- P. Life-Cycle Assessment: an evaluation of the environmental effects of a product from cradle to grave, as defined by ISO 14040-2006 and ISO 14044-2006.
- Q. Product (Permanently Installed Building Product): an item that arrives on the Project site either as a finished element ready for installation or as a component to another item assembled on-site. The product unit is defined by the functional requirement for use in the Project; this includes the physical components and services needed to serve the intended function of the permanently installed building product. In addition, similar product within a specification, each contributes as a separate product.
- R. Product Reporting Scope: All products specified in Divisions 2 through 10, 12, 31, and 32, including the following:
 - 1. All paints, coatings, adhesives, and sealants that are used but not specified.
 - 2. Composite wood that is permanently installed but not specified.
 - 3. Flooring
 - 4. Wall & ceiling systems

5. Thermal and acoustical insulation
 6. Furniture
- S. Raw Material: the basic substance from which products are made, such as concrete, glass, gypsum, masonry, metals, recycled materials (e.g., plastics and metals), oil (petroleum poly(lactic acid)), stone, agrifiber, bamboo, and wood.
- T. Recycled Content: the recycled content value of a material assembly shall be determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.
1. Post-consumer: material is defined as waste material generated by households or by commercial, industrial, and institutional facilities in their role as end users of the product, which can no longer be used for its intended purpose.
 2. Pre-consumer: material is defined as material diverted from the waste stream during the manufacturing process. Excluded is reutilization of materials, such as rework, regrind, or scrap, generated in a process and capable of being reclaimed within the same process that generated it.
- U. Regional Materials: materials extracted, harvested, or recovered, as well as manufactured, within 100 miles (160 km) of Project site. If only a fraction of a product or material is extracted/harvested/recovered and manufactured locally, then only that percentage (by weight) shall contribute to the regional value.
- V. Reuse: the reemployment of materials in the same or a related capacity as their original application, thus extending the lifetime of materials that would otherwise be discarded. Reuse includes the recovery and reemployment of materials recovered from existing building or construction sites, also known as salvage.
- W. Structure: elements carrying either vertical or horizontal loads (e.g., walls, roofs, and floors) that are considered structurally sound and nonhazardous.
- X. Wet Products: Materials and products installed in wet form, including paints, sealants, adhesives, and special coatings

1.05 CONTRACTOR LEED KICK-OFF MEETING

- A. Conduct a LEED Contractor Kick-Off Meeting with contractor, sub-contractors, and LEED consultant upon mobilization.

1.06 ADMINISTRATIVE REQUIREMENTS

- A. Respond to questions and requests from Architect, LEED Consultant and the USGBC regarding LEED credits that are the responsibility of the Contractor, that depend on product selection or product qualities, or that depend on Contractor's procedures until the USGBC has made its determination on the Project's LEED certification application. Document responses as informational submittals.

1.07 SUBMITTALS

- A. LEED Submittals: Information required to document LEED credits as defined in other Division 01 Sections and in individual Specification Sections. Include "LEED and WELL Materials Reporting Form" in Document 00 60 00 "Forms" for every submittal for the Project.
- B. Contractor shall include LEED Consultant on the submittal distribution list and review submittals as applicable the Scope of Work. LEED Consultant shall indicate respective Action Taken on all submittals. Contractor is responsible for responding to LEED Consultant's submittal responses within 15 days, as needed.
 - 1. LEED Consultant Action Taken submittal responses will be as follows:
 - a. Compliant: Product(s) included in the Submittal are LEED compliance and no further action from the Contractor is required.
 - b. Rejected: Product(s) included in the Submittal do not meet LEED compliance and an alternative, compliant product(s) must be re-selected and re-submitted by the Contractor.
 - c. Revise and Resubmit: Product(s) included in the Submittal lack required submittal documentation and as such LEED compliance can't be determined. Contractor shall re-submit Submittal with all required product documentation.
 - d. Not Reviewed: Product(s) included in the Submittal are not applicable to the LEED scope of work.
- C. Sustainable design submittals are in addition to other submittals.
 - 1. If submitted item is identical to that submitted to comply with other requirements, include an additional copy with other submittal as a record copy of compliance with indicated LEED requirements instead of separate sustainable design submittal. Mark additional copy "Sustainable design submittal".
- D. Sustainable Design Documentation Submittals:
 - 1. Materials and Resources: Building Product Disclosure and Optimization - Environmental Product Declarations. Option 1. Environmental Product Declarations. For each product submit:
 - a. If available, submit publicly available critically reviewed life-cycle assessment conforming to ISO 14044 that have at least a cradle to gate scope.
 - b. Alternate: Submit product-specific Type III EPD Internally Reviewed in accordance with ISO 14071.
 - c. Alternate: Submit industry wide generic EPD in accordance with ISO 14025 and EN 15804 or ISO 21930 – products with third-party certification (Type III) including external verification, in which the manufacturer is explicitly recognized as a participant by the program operator.
 - d. Alternate: Submit product-specific Type III EPD in accordance with ISO 14025 and EN 15804 or ISO 21930 – products with third-party certification (Type III) including external verification in which the manufacturer is explicitly recognized as a participant by the program operator.
 - 2. Materials and Resources: Building Product Disclosure and Optimization - Environmental Product Declaration. Option 2. Multi Attribute Optimization. For each product submit:

- a. If available, provide a third-party EPD or verified LCA for each product that conforms to the requirements of ISO 21930 and have demonstrated environmental impact reductions below industry average in at least three environmental impact categories.
 - b. For products meeting the above criteria, submit a letter stating the extraction, manufacturing, and purchasing locations of all products.
3. Materials and Resources: Building Product Disclosure and Optimization – Sourcing of Raw Materials. Responsible Sourcing of Raw Materials. For each product, submit:
- a. Extended Producer Responsibility: Products purchased from a manufacturer (producer) that participates in an extended producer responsibility program. Include statement of costs.
 - b. Bio-Based Materials: Bio-based products meeting the Sustainable Agriculture Network's Sustainable Agriculture Standard and tested using ASTM Test Method D6866 and legally harvested. Include statement of costs.
 - c. Materials Reuse: Reuse includes salvage, refurbish, or reused products. Include statements of costs.
 - d. Chain-of-Custody Certificates: For certified wood products. Include statements of costs.
 - e. Recycled Products: A letter stating the dollar value of the sum of post-consumer recycled content plus one half the pre-consumer recycled content.
 - f. For products meeting the above criteria, submit a letter stating the dollar value of all products that are extracted, manufactured, and purchased (including distribution) within 100-mile radius of the Project site.
4. Materials and Resources: Building Product Disclosure and Optimization – Material Ingredients. Option 1. Material Ingredients Reporting. For each product, submit:
- a. A chemical inventory of the product to at least 0.1% (1000 ppm) using one of the following criteria:
 - 1) A publicly available inventory of all ingredients identified by name and Chemical Abstract Service Registration Number (CASRN). Materials defined as trade secret or intellectual property may withhold the name and/or CASRN but must disclose role, amount and GreenScreen benchmark, as defined in GreenScreen v1.2.
 - 2) Health Product Declaration with full disclosure of known hazards in compliance with the Health Product Declaration open Standard.
 - 3) Cradle-to-Cradle v3 Certified level certification documentation or Material Health Certificate.
 - 4) Declare product label designated as Red List Free or Declared and LBC compliant demonstrating content inventory to 0.1% (1000 ppm).
 - 5) Product Lens Certification
 - 6) ANSI/BIFMA e3 Furniture Sustainability Standard demonstrating at least 3 points under BIFMA 7.5.1.3 Advanced Level in e3-2014 or 3 points under 7.4.1.3 Advanced Level in e3-2012.
 - 7) Facts – NSF/ANSI 336
5. Documentation complying with Section 01 74 19 “Construction Waste Management and Disposal.”
- a. Construction and Demolition Waste Management. For all products submit:

- 1) A letter stating the total weight and volume of waste diverted from landfills. Provide details of how the waste was recovered, reused, or recycled.
6. Indoor Environmental Quality: Low Emitting Materials. See Section 01 61 16 "Volatile Organic Compounds (VOC) Content Restrictions":
- a. Adhesives and Sealants:
 - 1) Product data sheets for adhesives and sealants used inside the weatherproofing system, indicating VOC content
 - 2) Product data sheets confirming that products have been tested and determined compliant in accordance with CDPH SM.
 - 3) Provide a narrative to describe any special circumstances or non-standard compliance path taken by the project.
 - b. Paints and Coatings:
 - 1) Product data sheets for paints and coatings used inside the weatherproofing system, indicating VOC content
 - 2) Product data sheets confirming that products have been tested and determined compliant in accordance with CDPH SM.
 - 3) Provide a narrative to describe any special circumstances or non-standard compliance path taken by the project.
 - c. Flooring Systems:
 - 1) Product data sheets confirming that products have been tested and determined compliant in accordance with CDPH SM.
 - d. Composite Wood & Agrifiber Products:
 - 1) Product data sheets confirming that all products meet the CARB (ATCM) requirements for no added urea formaldehyde resins.
 - e. Ceiling, Walls, Thermal, and Acoustic Insulation:
 - 1) Product data sheets confirming that products have been tested and determined compliant in accordance with CDPH SM.
 - f. Furniture
 - 1) Submit the total cost of all furniture, including purchase price, taxes, and delivery to site, but not labor, tools, or equipment for installation; submit prior to or along with initial application for payment; update and re-submit whenever the total cost changes due to contract modifications.
7. Indoor Environmental Quality: Construction Indoor-Air-Quality (IAQ) Management. See Section 01 57 27 "Indoor Air Quality Controls":
- a. Construction IAQ management plan.
 - b. Product data for temporary filtration media.
 - c. Product data for filtration media used during occupancy.
 - d. Construction Documentation: Six photographs at three different times during the construction period, along with a brief description of the SMACNA approaches employed, documenting implementation of the IAQ management measures, such as protection of ducts and on-site stored or installed absorptive materials.

8. Indoor Environmental Quality: Indoor Air Quality Assessment. See Section 01 57 27 "Indoor Air Quality Controls". Project to determine Indoor Air Quality Assessment pathway during construction:
 - a. Signed statement describing the building air flush-out procedures, including the dates when flush-out was begun and completed and statement that filtration media was replaced after flush-out.
 - b. Product data for filtration media used during flush-out and occupancy
 - c. Report from testing and inspecting agency indicating results of IAQ testing and documentation showing compliance with IAQ testing procedures and requirements.

1.08 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For LEED coordinator.
- B. Project Materials Cost Data: Provide statement indicating total cost for materials used for Project. Costs exclude labor, overhead, and profit. Include breakout of costs for the following categories of items:
 1. Plumbing
 2. Mechanical
 3. Electrical
 4. Specialty items, such as elevators and equipment
- C. Sustainable Design Action Plans: Provide preliminary submittals within 14 days of date established for the Notice to Proceed indicating how the following requirements will be met:
 1. List of proposed products with Environmental Product Declarations. Option 1.
 2. List of proposed products complying with requirements for sourcing of raw materials disclosure.
 3. List of proposed products complying with requirements for material ingredients reporting. Option 1.
 4. List of proposed products complying with requirements for low emitting materials complying with Section 01 61 16 "VOC Content Restrictions"
 5. Construction and Demolition Waste Management Planning complying with Section 01 74 19 "Construction Waste Management and Disposal".
 6. Construction IAQ Management Plan complying with Section 01 57 21 "Indoor Air Quality Controls".
- D. Volumes of all adhesives, sealants, paints and coatings used on project.
- E. Sustainable Design Progress Reports: Concurrent with each Application for Payment, submit reports comparing actual construction and purchasing activities with sustainable design action plans.

1.09 QUALITY ASSURANCE

- A. LEED Coordinator: Engage an experienced LEED-accredited professional to coordinate LEED requirements. LEED coordinator may also serve as waste management coordinator

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Provide products and procedures necessary to obtain LEED credits required in this Section. Although other Sections may specify some requirements that contribute to these LEED credits, the Contractor shall provide additional materials and procedures necessary to obtain LEED credits indicated.
- B. At least 10 different products from at least three different manufacturers shall have Environmental Product Declarations (EPDs) that comply with LEED requirements.
 - 1. EPDs must conform to ISO 14025 and EN 15804 or ISO 21930 and have at least a cradle to gate scope.
- C. At least 20% of the permanently installed building products, by cost, shall meet at least one of the responsible extraction criteria below. Priority will be given to products harvested and manufactured within 100 miles of the project site.
 - 1. Extended producer responsibility
 - 2. Bio-based materials
 - 3. FSC certified wood products
 - 4. Materials reuse
 - 5. Recycled content
- D. At least 10 different products from at least three different manufacturers shall comply with LEED requirements for material ingredient reporting. The reporting program options include but are not limited to:
 - 1. Health Product Declarations (HPDs): Measured to 1,000 ppm or 100 ppm.
 - 2. Cradle to Cradle v3 Bronze or v2 Basic or better
 - 3. Declare Label, evaluated and disclosed to 1,000 ppm.
 - 4. GreenScreen v1.2

2.02 LOW-EMITTING MATERIALS

- A. Indoor Environmental Quality Credits:
 - 1. All materials in this category to comply with the minimum requirements listed under LEED BD+C v4.1 IAQ Low Emitting Materials credit.
- B. Paints and Coatings: For field applications, all paints and coatings inside the weatherproofing system shall comply with the applicable VOC content limits of the California Air Resources Board (CARB) 2007, Suggested Control Measures (SCM) for Architectural Coatings, or the South Coast Air Quality Management District (SCAQMD) Rule 1113, effective June 3, 2011. This includes but is not limited to:
 - 1. Flat Paints and Coatings: 50 g/L
 - 2. Non-flat Paints and Coatings: 50 g/L
 - 3. Dry-Fog Coatings: 150 g/L

4. Primers, Sealers, and Undercoaters: 100 g/L
 5. Rust-Preventive Coatings: 100 g/L
 6. Zinc-Rich Industrial Maintenance Primers: 100 g/L
 7. Pretreatment Wash Primers: 420 g/L
 8. Clear Wood Finishes, Varnishes: 275 g/L
 9. Clear Wood Finishes, Lacquers: 275 g/L
 10. Floor Coatings: 50 g/L
 11. Shellacs, Clear: 730 g/L
 12. Shellacs, Pigmented: 550 g/L
 13. Stains: 100 g/L
 14. Waterproofing Sealers: 100 g/L
 15. Waterproofing concrete/masonry sealers: 100 g/L
 16. Swimming Pool Coatings: 340 g/L
 17. Fire-Proofing Coatings: 150 g/L
 18. Concrete – Curing Compounds: 100 g/L
 19. Roof Coatings: 50 g/L
 20. Roof Primers, Bituminous: 350 g/L
 21. Anti-Graffiti Coatings: 50 g/L
 22. Colorant – Architectural Coatings: 50 g/L
- C. Paints and Coatings: For field applications that are inside the weatherproofing system 75% of paints and coatings, by volume or surface area, shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers" (CDPH SM v1.2-2017).
- D. Adhesives and Sealants: For field applications that are inside the weatherproofing system, all adhesives and sealants shall comply with the applicable VOC content limits of the South Coast Air Quality Management District (SCAQMD) Rule 1168, Adhesive and Sealant Applications, effective June 1, 2005. This includes but is not limited to:
1. Wood Glues: 30 g/L
 2. Metal-to-Metal Adhesives: 30 g/L.
 3. Adhesives for Porous Materials (Except Wood): 50 g/L.
 4. Subfloor Adhesives: 50 g/L.
 5. Plastic Foam Adhesives: 50 g/L.
 6. Carpet Adhesives: 50 g/L.
 7. Carpet Pad Adhesives: 50 g/L.
 8. VCT and Asphalt Tile Adhesives: 50 g/L.
 9. Cove Base Adhesives: 50 g/L.
 10. Gypsum Board and Panel Adhesives: 50 g/L.
 11. Rubber Floor Adhesives: 60 g/L.
 12. Ceramic Tile Adhesives: 65 g/L.
 13. Multipurpose Construction Adhesives: 70 g/L.
 14. Fiberglass Adhesives: 80 g/L.
 15. Contact Adhesives: 80 g/L.
 16. Structural Glazing Adhesives: 100 g/L.
 17. Wood Flooring Adhesives: 100 g/L.
 18. Structural Wood Member Adhesives: 140 g/L.
 19. Single-Ply Roof Membrane Adhesives: 250 g/L.

20. Special-Purpose Contact Adhesives (That Are Used to Bond Melamine-Covered Board, Metal, Unsupported Vinyl, Rubber, or Wood Veneer 1/16 Inch or Less in Thickness to Any Surface): 250 g/L.
 21. Top and Trim Adhesives: 250 g/L.
 22. Plastic Cement Welding Compounds: 250 g/L.
 23. ABS Welding Compounds: 325 g/L.
 24. CPVC Welding Compounds: 490 g/L.
 25. PVC Welding Compounds: 510 g/L.
 26. Adhesive Primer for Plastic: 550 g/L.
 27. Sheet-Applied Rubber Lining Adhesives: 850 g/L.
 28. Aerosol Adhesive, General-Purpose Mist Spray: 65 percent by weight.
 29. Aerosol Adhesive, General-Purpose Web Spray: 55 percent by weight.
 30. Special-Purpose Aerosol Adhesives (All Types): 70 percent by weight.
 31. Other Adhesives: 250 g/L.
 32. Architectural Sealants: 250 g/L.
 33. Non-Membrane Roof Sealants: 300 g/L.
 34. Single-Ply Roof Membrane Sealants: 450 g/L.
 35. Other Sealants: 420 g/L.
 36. Sealant Primers for Nonporous Substrates: 250 g/L.
 37. Sealant Primers for Porous Substrates: 775 g/L.
 38. Modified Bituminous Sealant Primers: 500 g/L.
 39. Other Sealant Primers: 750 g/L.
- E. Adhesives and Sealants: For field applications that are inside the weatherproofing system, 75% of adhesives and sealants, by volume or surface area, shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers" (CDPH SM v1.2-2017).
- F. Flooring: At least 90% of all flooring shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers" (CDPH SM v1.2-2017).
- G. Composite Wood: At least 75% of composite wood, agrifiber products, and adhesives, by cost or surface area, shall be made with ultra-low-emitting formaldehyde (ULEF) resins as certified under EPA Toxic Substances Control Act, Formaldehyde Emission Standards for Composite Wood Products (EPA TSCA Title VI) or California Air Resources Board's (CARB) Airborne Toxic Control Measure (ATCM) to reduce formaldehyde emissions from composite wood products, or shall be made with no added formaldehyde (NAF).
- H. Wall Panels: At least 75% of all wall panels, by cost or surface area, including finish wall treatments (wall coverings, wall paneling, wall tile), surface wall structures such as gypsum or plaster, cubicle/curtain/partition walls, trim doors, frames, windows, and window treatments shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers" (CDPH SM v1.2-2017).
- I. Ceilings: At least 90% of all ceilings, by cost or surface area, including ceiling panels, ceiling tile, surface ceiling structures such as gypsum or plaster, suspended systems (including canopies and clouds), and glazed skylights shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Environmental Chambers" (CDPH SM v1.2-2017).
- J. Insulation: At least 75% of all insulation, including thermal and acoustic boards, batts, rolls, blankets, sound attention fire blankets, foamed-in place, loose-fill, blown, and sprayed insulation

shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers" (CDPH SM v1.2-2017).

- K. Furniture: All new furniture and furnishing items must be tested in accordance with ANSI/BIFMA Standard Method M7.1–2011 and comply with ANSI/BIFMA e3-2011 Furniture Sustainability Standard, Sections 7.6.1 (for half credit, by cost) OR 7.6.2 (for full credit, by cost), using either the concentration modeling approach or the emissions factor approach. Model test results using the open plan, private office, or seating scenario in ANSI/BIFMA M7.1, as appropriate. For classroom furniture, use the standard school classroom model in CDPH Standard Method v1.1. Documentation submitted for furniture must include the exposure scenario(s) used to determine compliance. Organizations that certify manufacturers' claims must be accredited under ISO Guide 17065.

PART 3 - EXECUTION

3.01 NONSMOKING BUILDING

- A. Smoking is not permitted at any time within the building or within 25 feet of it.

3.02 LOW EMITTING MATERIALS

- A. Comply with Section 01 61 16 "VOC Content Restrictions"

3.03 CONSTRUCTION WASTE MANAGEMENT

- A. Comply with Section 01 74 19 "Construction Waste Management and Disposal."

3.04 CONSTRUCTION IAQ MANAGEMENT

- A. Comply with Section 01 57 21 "Indoor Air Quality Controls."

3.05 INDOOR AIR QUALITY ASSESSMENT

- A. Comply with Section 01 57 21 "Indoor Air Quality Controls."

LEED CHECKLIST

Yes	Y?	?	No	P...	Credit ID & Name	Points Available	CALGr... Overlap
20	29	18	45		Chabot M&O	110	
Certification Level Status (Confirmed + Likely) = 49 Points						Certified	
INTEGRATIVE PROCESS							
1			0	D	IPc1 - Integrative Process	1	
1			0		Totals	1	
LOCATION & TRANSPORTATION							
			16	D	LTc1 - LEED for Neighborhood Development Location	16	
	1		0	D	LTc2 - Sensitive Land Protection	1	
1			1	D	LTc3 - High Priority Site	2	
2			3	D	LTc4 - Surrounding Density & Diverse Uses	5	
1			4	D	LTc5 - Access to Quality Transit (v4.1)	5	
1			0	D	LTc6 - Bicycle Facilities (v4.1)	1	
			1	D	LTc7 - Reduced Parking Footprint (v4.1)	1	
			1		LTc8 - Electric Vehicles (v4.1)	1	
5	1		10		Totals	16	
SUSTAINABLE SITES							
				C	SSp1 - Construction Activity Pollution Prevention	Required	●
1			0	D	SSc1 - Site Assessment	1	
	2		0	D	SSc2 - Protect or Restore Habitat (v4.1)	2	
1			0	D	SSc3 - Open Space (v4.1)	1	
	1	2	0	D	SSc4 - Rainwater Management (v4.1)	3	
2			0	D	SSc5 - Heat Island Reduction (v4.1)	2	
	1		0	D	SSc6 - Light Pollution Reduction	1	
4	4	2			Totals	10	
WATER EFFICIENCY							
				D	WEp1 - Outdoor Water Use Reduction	Required	●
				D	WEp2 - Indoor Water Use Reduction	Required	●
				D	WEp3 - Building-Level Water Metering	Required	●
2			0	D	WEc1 - Outdoor Water Use Reduction	2	●
	5		1	D	WEc2 - Indoor Water Use Reduction	6	●
1			1	D	WEc3 - Optimize Process Water Use (v4.1)	2	
	1		0	D	WEc4 - Water Metering	1	
3	6		2		Totals	11	
ENERGY & ATMOSPHERE							
				C	EAp1 - Fundamental Commissioning & Verification	Required	●
				D	EAp2 - Minimum Energy Performance	Required	●
				D	EAp3 - Building-Level Energy Metering	Required	●
				D	EAp3 - Fundamental Refrigerant Management	Required	●
			6	C	EAc1 - Enhanced Commissioning	6	
	5		13	D	EAc2 - Optimize Energy Performance	18	●
		1	0	D	EAc3 - Advanced Energy Metering	1	
		2	3	D	EAc4 - Renewable Energy (v4.1)	5	

Yes	Y?	?	No	P...	Credit ID & Name	Points Available	CALGr... Overlap
🔒	🔒	🔒	🔒	🔒	🔒	🔒	🔒
		1	0	D	EAc5 - Enhanced Refrigerant Management	1	
		2	0	C	EAc6 - Grid Harmonization (v4.1)	2	
	5	6	22		Totals	33	
					MATERIALS & RESOURCES		
				D	MRp1 - Storage & Collection of Recyclables	Required	●
				D	MRp2 - Construction & Demolition Waste Management Planning	Required	●
		2	3	D	MRc1 - Building Life-Cycle Impact Reduction (v4.1)	5	
	1	1	0	C	MRc2 - Environmental Product Declarations (v4.1)	2	
	1		1	C	MRc4 - Sourcing of Raw Materials (v4.1)	2	
	1	1	0	C	MRc5 - Material Ingredients (v4.1)	2	
	1	1	0	C	MRc6 - C&D Waste Management	2	●
	4	5	4		Totals	13	
					INDOOR ENVIRONMENTAL QUALITY		
				D	IEQp1 - Minimum Indoor Air Quality Performance	Required	●
				D	IEQp2 - Environmental Tobacco Smoke Control	Required	●
	1		1	D	IEQc1 - Enhanced Indoor Air Quality Strategies	2	
	3		0	C	IEQc2 - Low-Emitting Materials (v4.1)	3	
	1		0	C	IEQc3 - Construction IAQM Plan	1	●
	1	1	0	C	IEQc4 - Indoor Air Quality Assessment (v4.1)	2	
		1	0	D	IEQc5 - Thermal Comfort	1	
	1		1	D	IEQc6 - Interior Lighting (v4.1)	2	
		1	2	D	IEQc7 - Daylight (v4.1)	3	
		1	0	D	IEQc8 - Quality Views (v4.1)	1	
		1	0	D	IEQc9 - Acoustic Performance (v4.1)	1	
	7	5	4		Totals	16	
					INNOVATION		
1			0	D	INc1 - Exemplary Performance: MRc2 EPDs	1	
1			0	D	INc2 - Exemplary Performance: TBD	1	
1			0	D	INc3 - Pilot Credit: LEED O+M Starter Kit	1	
1			0	D	INc4 - Innovation: Green Building Education	1	
1			0	D	INc5 - Innovation: Occupant Comfort Survey	1	
1			0	D	LEED Accredited Professional	1	
6					Totals	6	
					REGIONAL PRIORITY		
	1		0	D	Indoor Water Use Reduction (required threshold: 4)	1	
			1	D	SSc4 Rainwater Management (Point Threshold: 3)	1	
1			0	D	WEc1 Outdoor Water Use Reduction (Point Threshold: 2)	1	
	1		0	D	MRc4 Sourcing of Raw Materials (Point Threshold: 1)	1	
			1	D	EAc2 Optimize Energy Performance (Point Threshold: 10)	1	
			1	D	LTc3 Access to Quality Transit (Point Threshold: 5)	1	
1	2		3		Totals	4	

				LEED Certification & Point Breakdown	<u>Certification</u>	
20				Certification Level: Confirmed	Not Certified	
	49			Certification Level: Confirmed + Likely	Certified	
		67		Certification Level: Confirmed + Likely + Maybe	GOLD	

END OF SECTION 01 81 13

SECTION 01 91 13
GENERAL COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Work Included:
 - 1. Scope of systems and equipment to be commissioned.
 - 2. Commissioning duties and procedures at the site.

1.2 RELATED SECTIONS

- A. Division 01, General Requirements applies to this Section.
- B. Contents of Division 22, 23, and 26 apply to this Section.
- C. In addition, reference the following:
 - 1. 22 08 00, Commissioning of Plumbing
 - 2. 23 08 00, Commissioning of HVAC
 - 3. 26 08 00, Commissioning of Electrical

1.3 REFERENCES AND STANDARDS

- A. References and Standards as required by:
 - 1. Division 01, General Requirements.
 - 2. 22 08 00, Commissioning of Plumbing
 - 3. 23 08 00, Commissioning of HVAC
 - 4. 26 08 00, Commissioning of Electrical
- B. In addition, meet the following:
 - 1. Current edition of the ASHRAE Guideline 0, The Commissioning Process.

1.4 SUBMITTALS

- A. Submittals as required by:
 - 1. Division 01, General Requirements.
 - 2. 22 08 00, Commissioning of Plumbing
 - 3. 23 08 00, Commissioning of HVAC
 - 4. 26 08 00, Commissioning of Electrical
- B. In addition, provide:
 - 1. Use the following procedure to ensure quick and effective turnaround of submittals for systems to be commissioned.
 - a. The Architect forwards one set of submittals for systems to be commissioned to the Commissioning Authority at the same time as the design team.

- b. The Commissioning Authority forwards comments to the design team for consideration in their submittal response.
- c. The design team sends a consolidated response to the submittals and copies the Commissioning Authority.

1.5 QUALITY ASSURANCE

- A. Quality assurance as required by:
 - 1. Division 01, General Requirements.
 - 2. 22 08 00, Commissioning of Plumbing
 - 3. 23 08 00, Commissioning of HVAC
 - 4. 26 08 00, Commissioning of Electrical

1.6 WARRANTY

- A. Warranty of materials and workmanship as required by Division 01, General Requirements.
 - 1. Division 01, General Requirements.
 - 2. 22 08 00, Commissioning of Plumbing
 - 3. 23 08 00, Commissioning of HVAC
 - 4. 26 08 00, Commissioning of Electrical

1.7 DEFINITIONS

- A. Commissioning Authority: The Commissioning Authority is the person or entity referred to throughout the Contract Documents as if singular in number who works with the Owner's Authorized Representative under a separate Contract.
- B. Commissioning:
 - 1. Commissioning is a process for achieving, verifying, and documenting that performance of a building and its various energy consuming systems meets the Design Engineer's design intent and the Owner's operational needs.
 - 2. Commissioning includes tests for the operation of equipment and building systems to ensure that they operate as designed by the Design Engineer, and meet the needs of the building throughout the entire range of operating conditions.
 - 3. Commissioning is a cooperative effort that requires participation by the Owner's Authorized Representative, General Contractor, system and equipment installers, building automation system installer, Testing and Balancing Agency, equipment manufacturers' representatives, Architect, Architect's design engineers, and Commissioning Authority.
- C. Owner's Project Requirements (OPR): Document that details the functional requirements and expectations of how the building will be used and operated. This may include project location, goals, cost considerations, equipment manufacturers, and environmental control requirements.
- D. Basis of Design (BoD): A document that records concepts, calculations, decisions, and product selections used to meet the OPR and to satisfy applicable regulatory requirements, standards, and guidelines.
- E. Commissioning Procedures:

1. Inspection and testing procedures that are written by the Commissioning Authority for equipment and systems within the scope of commissioning.
 2. Inspection checklists typically address items of installation compliance with design intent and approved submittals.
 3. Functional performance test procedures typically address all sequences for normal and emergency equipment and system operation. These procedures consist of a mix of One-Time Tests and Continuous Measurement.
 4. One-Time Tests: Functional performance tests of equipment and systems that are performed by forcing specific conditions that are intended to trigger specific responses, per the design intent.
- F. Continuous Measurements:
1. Functional performance tests of equipment and systems that are performed by observing parameters of normal operation over an extended period. This is typically accomplished by means of the BAS trend logging capabilities, by monitoring with stand-alone data logging equipment, or by some combination of both.
 2. Temperature conditions in occupied spaces, control stability, and lighting levels in areas with daylighting controls are three typical subjects of continuous measurement.
- G. Commissioning Plan: The document, provided by the Commissioning Authority, that states the required tests for all equipment and systems within the scope of commissioning.
- H. Commissioning Meetings: Issues related to commissioning will be discussed as required during regularly scheduled progress meetings.

1.8 PERFORMANCE REQUIREMENTS

- A. Testing, inspecting and performance monitoring tasks specified in this Section and in Sections 22 08 00, 23 08 00, and 26 08 00 are the responsibility of the Commissioning Authority, unless specifically indicated otherwise, and not part of the General Construction Contract. These tasks are included in these Sections for the Contractor's information, so the Contractor can understand the standards of system performance that are required and more effectively coordinate with the process of commissioning.
- B. The Commissioning Authority will verify for the Owner's Authorized Representative that commissioned mechanical, plumbing, electrical, and controls system function interactively and in compliance with the Project design intent, and to facilitate orderly and efficient transfer of building operating systems to the Owner.
- C. Commissioning does not relieve the Contractor of Contract obligations.

1.9 EQUIPMENT AND SYSTEMS TO BE COMMISSIONED

- A. Systems:
1. HVAC Equipment
 2. HVAC Controls.
 3. Domestic Hot Water Equipment
 4. Automatic Lighting Controls (LCP, Daylighting, Occupancy Sensors)

1.10 COMMISSIONING DUTIES

- A. Duties of Owner: Provide the OPR to the Architect/Engineer and Commissioning Authority prior to design development.
- B. Duties of Architect:
 - 1. Attend commissioning portion of Progress Meetings as necessary, minimum two meetings.
 - 2. Lead the design team in assisting the resolution of deficiencies.
- C. Duties of Architect's Mechanical Engineer:
 - 1. Attend commissioning portion of Progress Meetings as necessary, minimum two meetings.
 - 2. At the request of either the Owner's Authorized Representative or the Commissioning Authority, review Commissioning Procedures and submit comments to Owner's Authorized Representative.
 - 3. Develop and provide the Basis of Design to Owner and Commissioning Authority prior to 50 percent CD.
 - 4. Assist in resolution of problems and deficiencies that are discovered during commissioning.
 - 5. Participate and respond to commissioning related issues by using the Commissioning Authority's web based commissioning software Facility Grid.
- D. Duties of Architect's Electrical Engineer:
 - 1. Attend commissioning portion of Project Meetings as necessary.
 - 2. At request of either the Owner's Authorized Representative or the Commissioning Authority, review Commissioning Procedures and submit comments to Owner's Authorized Representative.
 - 3. Develop and provide the Basis of Design to Owner and Commissioning Authority prior to 50 percent CD.
 - 4. Assist in resolution of problems and deficiencies that are discovered during commissioning.
 - 5. Participate and respond to commissioning related issues by using the Commissioning Authority's web based commissioning software Facility Grid.
- E. Duties of Commissioning Authority:
 - 1. Attend commissioning portion of Project Meetings as necessary, minimum two meetings.
 - 2. Review the BoD to the OPR and design related to commissioned systems, and make comments through the Owner's Authorized Representative prior to 50 percent CD, and perform another backcheck review prior to 100 percent CD.
 - 3. EAc3: Review Contractor's and Control Contractor's submittals related to commissioned systems, and make comments through Architect.
 - 4. Provide plan to Owner's Authorized Representative for review and comment.
 - 5. Utilize web based Commissioning software to manage all commissioning related checklists, tests, issues, and observation reports.
 - 6. Prepare commissioning procedures for each commissioned system based on actual system configuration.
 - 7. Commissioning Procedures written by Commissioning Authority will include, in field data collection format, the detailed test procedures, test conditions, and criteria for acceptance of test results.

8. Submit any commissioning procedures that are written by Commissioning Authority to the Owner's Authorized Representative for review and approval at least 1 week prior to scheduled field testing.
9. Provide personnel experienced in technical aspects of each system to be commissioned for execution of tests.
10. BAS Sequence Demonstration:
 - a. Witness the Control Contractor's demonstration of their sequence tests.
 - b. If any of the demonstrated sequences fails to operate per the controls submittal, witness the repeat demonstration after corrective action has been taken.
11. Execute the Commissioning Procedures.
12. Prepare and submit Observation Reports and Deficiency Reports as required, but within 3 days of noting any deficiency.
13. Submit to Owner's Authorized Representative a weekly written report of commissioning progress, unresolved deficiencies, and projected inspection, and test schedule during field testing.
14. Take the lead in timely evaluation of deficiencies, and advise Owner's Authorized Representative on resolution.
15. Assist in resolving commissioned system disputes by performing research to determine the scope of the dispute, and informing the involved parties on possible solutions to disputes.
16. During the systems warranty period(s) CxA to retest any systems that had their full testing deferred during the initial functional testing due to the lack of peak season conditions. This testing must ensure that all system sequences of operations and capacity have been verified.
17. Verify that the Owner's maintenance personnel are adequately trained as per the Contract Documents and the OPR.
18. Develop a Systems Manual which describes system descriptions, sequence of operations, general maintenance requirements and intervals, recommended sensor calibration and energy efficiency best practices.
19. EAc3: Perform a review of building operation within 10 months after substantial completion, and a plan for resolution of outstanding issues.
20. Prepare a Commissioning Report that includes a summary of overall commissioning process, including deficiencies found, deficiency corrections, unresolved deficiencies, approved equipment and systems, discrepancies between final design intent and as-built systems, completed commissioning checklists, test documentation, and other commissioning documentation.

F. Duties of General Contractor:

1. Attend commissioning portion of Project Meetings as necessary, minimum four meetings.
2. Participate and respond to commissioning related issues by using the Commissioning Authority's web based commissioning software Facility Grid.
3. Coordinate and direct system installers in executing their commissioning tasks.
4. Direct subcontractors to participate and respond to commissioning related issues by using the Commissioning Authority's web based commissioning software Facility Grid. A desktop, laptop, tablet or iPad will be required.
5. Coordinate with Commissioning Authority on integration of construction and commissioning schedules.
6. Oversee and perform documentation requirements for all Pre-Functional Checklists.
7. Notify Commissioning Authority when all the following has been achieved. It is permissible, with prior approval by Commissioning Authority, to provide notification for individual systems as the following are all completed for each system.
 - a. All controls point-to-point and sequence checkout is complete.
 - b. All test and balancing is complete.
 - c. Normal equipment schedules have been activated.

- d. All control overrides and temporary valves have been returned to normal automatic control.
 - e. All manual isolation valves have been left open.
 - f. Piping and duct systems have been cleaned and tested.
 - g. Heating water system is fully operational under normal automatic operation.
 - h. Luminaires are installed with operational daylighting controls and occupancy sensors.
 - i. Distribution boards, including overcurrent devices, containing breakers over 600 amps, are installed.
 - j. Building inspector acceptance of emergency lighting system following their site inspection.
8. Provide all startup, flushing, pressure testing, etc results/reports for commissioned systems.
- G. Duties of Installer's and Manufacturer's Representatives:
1. Attend commissioning portion of Project Meetings as necessary, minimum two meetings.
 2. Participate and respond to commissioning related issues by using the Commissioning Authority's web based commissioning software Facility Grid.
 3. Within three months of the award of the Contract, as part of the required submittals for the contract, Contractor submits manufacturer's startup and installation procedures as well as controls point-to-point and sequence checkout and provides in checkset format for each piece of equipment and controls.
 4. Demonstrate proper system operation in the presence of the Commissioning Authority.
 5. Commissioning does not relieve installers from obligations to complete Work as required by Contract Documents.
- H. Duties of BAS Installer:
1. Attend commissioning portion of project meetings as necessary, minimum two meetings.
 2. Participate and respond to commissioning related issues by using the Commissioning Authority's web based commissioning software Facility Grid.
 3. Review and approve Commissioning Procedures as relevant to controls work.
 4. Point-to-Point Checkout:
 - a. Perform point-to-point checkout and calibration of all energy management system points.
 - b. Document checkout and calibration on forms as approved by mechanical designer, and/or Commissioning Authority.
 - c. Submit three copies of the completed point-to-point checkout forms to the Owner's Authorized Representative within five working days of completion of field checkout. Distribute copies to the Commissioning Authority and the designer.
 5. Control Sequence Testing:
 - a. Prepare control sequence test procedure forms to a degree of rigor comparable to the Commissioning Authority's Commissioning Procedures.
 - b. Submit test procedure forms to the Commissioning Authority for approval at least two weeks prior to intended sequence testing. At the contractor's option, it is acceptable to use the Commissioning Authority's Commissioning Procedures, substituting one-time tests for continuous measurement wherever applicable. However, it is still necessary to submit any edited Commissioning Authority Commissioning Procedures as least two weeks prior to intended sequence testing.
 - c. Submit the completed sequence testing forms to the Owner's Authorized Representative. The Owner's Authorized Representative distributes copies to the Commissioning Authority and the designer.
 6. Submit to Commissioning Authority, prior to Sequence Demonstration, two copies of installed control Drawings, sequence narratives, control wiring diagrams, and program code or block diagrams.

7. Sequence Demonstration:
 - a. After completing and documenting all required sequence tests with own staff, demonstrate sequence tests to the Commissioning Authority. Demonstration is to be performed by the BAS installer's programmer who programmed the control system for this specific project.
 - b. If any of the demonstrated sequences fails to operate per the controls submittal, take corrective action and demonstrate the failed sequence tests to the Commissioning Authority a second time.
 - c. If the Control Contractor fails to demonstrate proper sequence operation in any of the second round of sequence tests, the Commissioning Authority's costs for witnessing all further demonstration of that sequence may be assigned to the Control Contractor by the Owner as a deduct to their contracted price. The Control Contractor will not be responsible for costs related to failure due to design or to other factors beyond their control, though it is expected to call any design concerns (and other factors beyond their control that might cause failure) to the attention of the Commissioning Authority and the Owner's Authorized Representative.
 8. Assist Commissioning Authority with programming of the energy management system for trend logs to support functional performance testing during field testing.
 9. Assist Commissioning Authority with execution of the Commissioning Procedures. Commissioning Authority will present test schedule at Progress Meeting at least one week ahead of scheduled tests.
 10. The Commissioning Authority, acting with Owner authority, may request the Control Contractor to assist with or perform minor loop tuning adjustments, set point and schedule changes, and other similar minor field corrections.
 11. Recommended changes to the controls sequences, program code, and recommendations for additional points must go through the Owner's Authorized Representative and the designer. The designer is the final authority on all recommended sequence changes, and will submit such changes to the Owner's Authorized Representative for implementation.
 12. Submit to Owner's Authorized Representative, at least two weeks prior to Final Completion, two copies of as-built version of points list, including I/O and virtual points, controls Drawings, program printout, and sequence narratives.
 13. Participate in resolution of problems and deficiencies that are discovered during commissioning.
- I. Duties of Balancer:
 1. Attend commissioning portion of Project Meetings as necessary, minimum two meetings.
 2. Participate in resolution of problems and deficiencies that are discovered during commissioning.
 3. Assist Commissioning Authority with execution of commissioning procedures.
 4. Demonstrate accuracy of final balance report in the presence of the Commissioning Authority. This will be a 10 percent spot check.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 COMMISSIONING PROCEDURES AT THE SITE

A. Testing Techniques:

1. Each testing procedure may use a variety of techniques. Generally it is preferred to observe new and existing equipment and systems during normal operation.
 2. When functional and emergency modes of operation occur rarely or seasonally, if possible, simulate the conditions that trigger these operational modes.
 3. Simulation of conditions may involve changing set points, changing schedules, simulating pneumatic system pressures or energy management system voltages and currents, disconnecting power, jumpering contacts, or other such procedures.
 4. Whenever temporary adjustments are made, restore the system to its original condition once tests are completed.
 5. When testing requires observing equipment operation over an extended period, use the building energy management system's trend logging capabilities or independent monitoring equipment.
 6. Do not use the building automation system trend logging in the commissioning process prior to point-to-point checkout by Controls Contractor and approval of point-to-point checkout by Commissioning Authority.
 7. Measurement of room lighting levels during evening hours with only artificial lighting, during mid-morning, around noon and mid-afternoon with only natural lighting and with both natural and artificial lighting. Repeat same measurements following calibration of room daylighting sensor.
- B. Commissioning Documentation:
1. The Contractors are required to perform startup and checkout of their systems (prefunctional testing) and document the results in Facility Grid. The Commissioning Authority will provide electronic forms that may be used by the Contractors. The Contractors may use their own forms if they contain all the required information on the Commissioning Authority's forms, but prior approval must be obtained.
 - a. Where numeric data is required, a narrative entry or simple check-off is not acceptable.
 - b. Annotate trend logs and monitored data as necessary to clarify meaning, and attach to relevant test reports.
 - c. Do not attach irrelevant data to test reports.
 2. The Contractor sends the startup and checkout forms to the Commissioning Authority when they are complete and functional. The Contractor sends a "Certificate of Readiness" with the forms which will signal that functional testing can begin.
 3. The technician who performed the pretesting and checkout of the system completes the Pre-Functional Checklists using the web based commissioning software Facility Grid.
 4. E-mail an "issues log" weekly to inform the design and construction team of issues that need resolution. The "issues log" will open and close items as they are discovered and resolved until all items are closed.
 5. The Commissioning Authority will assemble all the information from the Commissioning Plan (test forms, trend logs, issues log, and basis of design) into a final Commissioning Report.
- C. Coordination of Commissioning and Equipment Startup: Do not initiate functional performance testing for equipment or systems in advance of their startup and checkout by affected equipment or system installers and manufacturers' representatives.
- D. Test Acceptance Criteria:
1. Acceptance Criteria are the test results that are required before the mode of performance or inspection item in question will be considered acceptable.
 2. Any procedures in Specification Sections 22 08 00, 23 08 00, or 26 08 00 that begin with "Verify that...." have an implied acceptance criterion that the sequence as stated is proven to occur and is documented with visual observation notes, measurements, trend logs, and/or monitored data.

3. Acceptance criteria for other functional modes and checklist items are as stated in each section of the Commissioning Plan.
 4. Input will be sought when necessary from the Architect's Engineer to determine if test results indicate compliance with Design Intent.
 5. The Commissioning Authority will recommend acceptance or rejection of commissioned system work based on test results.
- E. Resolution of Deficiencies:
1. Adjust, repair, or replace defective equipment and systems to meet Commissioning Procedure Acceptance Criteria as directed by Owner's Authorized Representative.
 2. Inform the Owner's Authorized Representative and Commissioning Authority of the date for completion of corrective activities.
 3. If the date for completion of corrective work passes without resolution of deficiencies, Owner's Authorized Representative reserves the right to obtain supplementary services and equipment to correct the problem as indicated in General Conditions.
- F. Rechecking and Retesting Charges:
1. In the event of a second failure of a specific commissioning procedure item or test, the responsible party may be assessed charges by Owner's Authorized Representative.
 2. Charges will be based on each party's actual expenses, including normal hourly billing rates for preparation, testing, and travel time, and materials, equipment rental, and travel expenses as applicable.
- G. Construction and Acceptance Milestones for Tasks Related to Commissioning:
1. Equipment, ductwork, and piping installation.
 2. Equipment startup.
 3. Pre-functional checklists.
 4. Substantial completion.
 5. Point-to-point checkout and sequence testing of controls.
 6. Test and balance.
 7. Commissioning field testing.
 8. Owner training.
 9. Occupant move-in.
 10. Final completion.
 11. Systems manual submittal.
 12. 10-month post occupancy review.
 13. Commissioning report submittal.

END OF SECTION

SECTION 02 41 19

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.
2. Demolition and removal of selected site elements.
3. Salvage of existing items to be reused or recycled.

B. Related Requirements:

1. Section 01 10 00 "Summary" for restrictions on use of the premises, Owner-occupancy requirements, and phasing requirements.
2. Section 01 56 39 "Temporary Tree and Plant Protection" for temporary protection of existing trees and plants that are affected by selective demolition.
3. Section 01 73 00 "Execution" for cutting and patching procedures.
4. Section 01 35 16 "Alteration Project Procedures" for general protection and work procedures for alteration projects.
5. Section 31 10 00 "Site Clearing" for site clearing and removal of above- and below-grade improvements not part of selective demolition.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at Project site.
 - 1. Inspect and discuss condition of construction to be selectively demolished.
 - 2. Review structural load limitations of existing structure.
 - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
 - 5. Review areas where existing construction is to remain and requires protection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For refrigerant recovery technician.
- B. Engineering Survey: Submit engineering survey of condition of building.
- C. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.
- D. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
 - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
 - 4. Use of elevator and stairs.
 - 5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- E. Predemolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Comply with Section 01 32 33 "Photographic Documentation." Submit before Work begins.
- F. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that

recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

- G. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

1.7 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.

1.8 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.9 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. Hazardous materials will be removed by Owner before start of the Work.
 - 2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Hazardous Materials: Present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
 - 1. Hazardous material remediation is specified elsewhere in the Contract Documents.
 - 2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
 - 3. Owner will provide material safety data sheets for suspected hazardous materials that are known to be present in buildings and structures to be selectively demolished because of building operations or processes performed there.
- F. Historic Areas: Demolition and hauling equipment and other materials shall be of sizes that clear surfaces within historic spaces, areas, rooms, and openings, including temporary protection, by 12 inches or more.
- G. Storage or sale of removed items or materials on-site is not permitted.

H. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

1.10 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties. Notify warrantor before proceeding. Existing warranties include the following:

B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

1.11 COORDINATION

A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

C. Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.

1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
- D. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.
- E. Verify that hazardous materials have been remediated before proceeding with building demolition operations.
- F. Survey of Existing Conditions: Record existing conditions by use of measured drawings and preconstruction photographs or video.
 1. Comply with requirements specified in Section 01 32 33 "Photographic Documentation."
 2. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
 3. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 PREPARATION

- A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 2. Arrange to shut off utilities with utility companies.
 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

- f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
- g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.4 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 - 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 01 50 00 "Temporary Facilities and Controls."
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 - 1. Strengthen or add new supports when required during progress of selective demolition.
- C. Remove temporary barricades and protections where hazards no longer exist.

3.5 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 - 5. Maintain fire watch during and for at least _____ hours after flame-cutting operations.
 - 6. Maintain adequate ventilation when using cutting torches.

7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 10. Dispose of demolished items and materials promptly. Comply with requirements in Section 01 74 19 "Construction Waste Management and Disposal."
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Removed and Salvaged Items:
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area designated by Owner.
 5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.
- 3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS
- A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.
- B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.
- C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.
- D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.

- E. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." Do not use methods requiring solvent-based adhesive strippers.
- F. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight.
 - 1. Remove existing roof membrane, flashings, copings, and roof accessories.
 - 2. Remove existing roofing system down to substrate.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and recycle or dispose of them according to Section 01 74 19 "Construction Waste Management and Disposal."
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 - 4. Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.

3.8 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

SECTION 03 10 00

CONCRETE FORMING AND ACCESSORIES

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes: All labor, materials and equipment and all operations required to complete all formwork as indicated on the drawings; to produce shapes and configurations as shown, as required; and as specified herein, including:
 - 1. Forms, shores, bracing, removal and other operations as necessary for all cast-in-place concrete and masonry placed.
 - 2. Setting and securing anchor bolts and other metal items embedded in concrete into formwork, using materials and layouts furnished and delivered to jobsite as specified under other sections.
- B. Related Sections:
 - 1. Pertinent Sections of Division 03 specifying concrete construction.
 - 2. Pertinent Sections of other Divisions specifying work to be embedded in concrete or work penetrating concrete foundations and formwork.

1.2 REFERENCES

- A. California Code of Regulations, Title 24, latest adopted edition (herein noted as CBC): Chapter 19A Concrete.
- B. American Concrete Institute (ACI) 347 "Recommended Practice for Concrete Formwork".
- C. American Plywood Association (APA) "Concrete Forming Guide".
- D. West Coast Lumberman Inspection Bureau (WCLIB) "Standard Grading Rules for West Coast Lumber".
- E. ACI SP-066 "ACI Detailing Manual".
- F. ACI 301 "Specifications for Structural Concrete".
- G. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice".

1.3 DESIGN REQUIREMENTS

- A. Design, engineer, and construct formwork, shoring and bracing to conform to design and code requirements, resist imposed loads; resultant concrete to conform to required shape, line and dimension.

1.4 SUBMITTALS

- A. Limitation of review: Structural Engineer's review will be required only where specifically requested for general architectural applications and features only. Contractor is

responsible for structural stability, load-resisting characteristics and sufficiency of form work design.

1.5 QUALITY ASSURANCE

- A. General: All form materials shall be new at start of work. Produce high quality concrete construction. Minimize defects due to joints, deflection of forms, roughness of forms, nonconforming materials, concrete or workmanship.
- B. Reuse of Forms: Plywood forms may be reused, if thoroughly cleaned of all dirt, mortar, and foreign materials, and undamaged at edges and contact face. Reuse shall be subject to permission from the Architect without exception, and issued in writing. Reuse of any panel which will produce a blemish on exposed concrete, will not be permitted.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Form Materials:
 - 1. Non-Exposed Surface Formwork Facing: Forms for concrete which is not exposed to view, may be of plywood as specified for exposed surfaces, or square edge 1x nominal Douglas Fir, Construction Grade, S4S.
 - 2. Exposed Surface Formwork Facing:
 - a. Forms for all exterior and interior concrete flat surfaces unless otherwise specified as board formed shall be new Douglas Fir Plywood (APA) ply, 5/8-inch, B-B Plyform, Class 1, Exterior Type, oiled and edged and edge-sealed conforming to U.S. Product Standard PS 1 in large sheet sizes to achieve joint patterns shown.
 - b. All exposed concrete edges shall be chamfered 3/4" minimum or as noted on the drawings.
 - 3. Exposed Surface Formwork - Special Pattern Form Liner:
 - a. Forms for all exterior and interior concrete flat surfaces indicated shall be as designated by Architect.
- B. Earth Forms: Allowed, subject to soil standing in excavations without ravel or caving.
- C. Form Release Agent: Spray-on compound, not affecting color, bond or subsequent treatment of concrete surfaces. Maximum VOC content shall comply with local requirements and California Green Building Code.
- D. Accessories: Types recommended by manufacturers or referenced standards to suit conditions indicated;
 - 1. Anchors, spacers, void in-fill materials: sized to resist imposed loads.
 - 2. Form Ties: Prefabricated rod, flat band, or wire snap ties with 1" break-back or threaded internal disconnecting type with external holding devices of adequate bearing area. Ties shall permit tightening and spreading of forms and leave no metal closer than 1" to surface.
- E. Corner Chamfers and Rustications: Filleted, wood strip or foam type; sizes and shapes as detailed, or 3/4 x 3/4 inch size minimum if not detailed; maximum possible lengths.
- F. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Inspect the substrate and the conditions under which concrete formwork is to be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected. Commencement of work indicates acceptance of substrates and conditions.
- B. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

3.2 EARTH FORMS

- A. If natural soil or compacted fill can be accurately cut and maintained, foundations and grade beams may be poured against earth without forming. Provide positive protection of trench top corners.
- B. Maintain earth forms free of water and foreign materials.

3.3 ERECTION – FORMWORK

- A. General: Construct formwork in accordance with calculations, and recommendations of Section 401 of ACI 347. Construct forms to the sizes, shapes, lines and dimensions shown, and as required to obtain accurate alignment, location, grades, level and plumb work in finished structure. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required. Use selected materials to obtain required finishes.
 - 1. Construct cambers specified in concrete members and slabs in the formwork.
 - 2. Schedule the work and notify other trades in ample time so that provisions for their work in the formwork can be made without delaying progress of the project. Install all sleeves, pipes, etc. for building services systems, or other work. Secure information about and provide for all openings, offsets, recessed nailing blocks, channel chases, anchors, ties, inserts, etc. in the formwork before concrete placement.
 - 3. Deflection: Formwork and concrete with excessive deflection after concrete placement will be rejected. Excessive deflection is that which will produce visible and noticeable waves in the finished concrete.
 - 4. Measure formwork for elevated structural slabs, columns, wall elevations points of maximum camber and submit in writing to the Architect/Engineer prior to placing concrete.
- B. Formwork Construction: Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301. Uniform, substantial and sufficiently tight to prevent leakage of concrete paste, readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials. Tie, brace, shore, and support to insure stability against pressures from any source, without failure of any component part and without excessive deflection. Solidly butt joints and provide backup material at joints as required to prevent leakage and fins.
- C. Provide all openings, offsets, inserts, anchorages, blocking, and other features of the work as shown or required. See INSERTS, EMBEDDED PARTS, AND OPENINGS for detailed requirements.

- D. Warped, checked, or scuffed forms will be rejected.
- E. Maintain membranes, reinforcing and other work free of damage; protect with plywood runway boards or other positive, durable means.
- F. Align joints and make watertight. Keep form joints to a minimum.
- G. Provide fillet and chamfer strips on external corners of exposed locations and as indicated to form patterns in finished work. Extend patterns around corners and into alcoves, on backs of columns and similar locations not otherwise shown.
 - 1. Produce beveled, smooth, solid, unbroken lines, except as otherwise indicated to conform to patterns.
 - 2. Form corners and chamfers with 3/4 inch x 3/4 inch strips, unless otherwise indicated, accurately formed and surfaced to produce uniformly straight lines and tight edge joints. Extend terminal edges to required limit and miter chamfer at changes in direction.
- H. Unexposed corners may be formed either square or chamfered.
- I. Ties and Spreaders: Arrange in a pattern acceptable to the Architect when exposed. Snap-ties may be used except at joints between pours where threaded internal disconnecting type shall be used.
- J. Coordinate this section with other sections of work that require attachment of components to formwork.
- K. Reglets and Rebates: Accurately locate, size, and form all reglets and rebates required to receive work of other trades, including flashing, frames, and equipment.

3.4 APPLICATION - FORM RELEASE AGENT

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations.
- B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
- C. Do not allow excess form coating material to accumulate in the forms or to come into contact with reinforcement or surfaces which will be bonded to fresh concrete.
- D. Coat steel forms with a non-staining, rust-preventative form oil or otherwise protect against rusting. Rust-stained steel formwork will be rejected.
- E. Leave no residue or stain on the face of the concrete, nor affect bonding of subsequent finishes or work specified in other sections.

3.5 INSERTS, EMBEDDED PARTS, AND OPENINGS

- A. Provide formed openings where required for items to be embedded in passing through concrete work.
 - 1. Provide openings in concrete formwork to accommodate work of other sections including those under separate contracts (if any). Size and location of openings, recesses and chases shall be in accordance with the section requiring such items. Accurately place and securely support items to be built into forms.

- B. Construction Joints: Construct and locate generally as indicated on Drawings and only at locations approved by Structural Engineer, so as not to impair the strength of the structure. Form keys in all cold joints shown or required.
- C. Locate and set in place items that will be cast directly into concrete.
- D. Rough Hardware and Miscellaneous Metal: Set inserts, sleeves, bolts, anchors, angles, and other items to be embedded in concrete. Set embedded bolts and sleeves for equipment to template and approved shop drawings prepared by trades supplying equipment.
- E. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other work.
- F. Wood Inserts and Nailers: Provide approved preservative-treated lumber. Set all required nailing blocks, grounds, and other inserts as required to produce results shown. Wood plugs shall not be used.
- G. Install accessories in accordance with manufacturer's instructions, so they are straight, level, and plumb. Ensure items are not disturbed during concrete placement.
- H. Piping: Do not embed piping in structural concrete unless locations specifically approved by Structural Engineer.
- I. Conduit: Place conduit below slabs-on-grade and only as specifically detailed on structural drawings. Minimum clear distance between conduits shall be 3 diameters. Location shall be subject to Engineer's written approval and shall not impair the strength of the structure.
- J. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.
 - 1. Provide openings for the introduction of vibrators at intervals necessary for proper placement.
 - 2. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.
- K. Install Form Liner inserts in accordance with manufacturer's recommendations, to produce patterns and textures indicated.
- L. Install waterstops in accordance with manufacturer's recommendations to provide continuous waterproof barrier.

3.6 FORM CLEANING

- A. Clean forms as erection proceeds, remove foreign matter within forms.
- B. Clean formed cavities of debris prior to placing concrete.
 - 1. Remove all dirt, chips, sawdust, rubbish, water and foreign materials detrimental to concrete.
 - 2. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.

3.7 FOOTINGS

- A. Verify elevations and provide final excavation required for footings prior to placing of concrete.

3.8 EQUIPMENT BASES

- A. Form concrete bases for all mechanical and electrical equipment in accordance with approved shop details furnished by other sections.
- B. Sizes and locations as indicated and as required to produce results shown.
- C. Provide coved base for all equipment bases placed on concrete slabs.

3.9 FORMWORK TOLERANCES

- A. Construct formwork to maintain tolerances required by ACI 301.

3.10 FIELD QUALITY CONTROL

- A. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and to verify that supports, fastenings, wedges, ties, and items are secure.
- B. Do not reuse wood formwork more than 2 times for concrete surfaces to be exposed to view. Do not patch formwork.
- C. Clean and repair surfaces to be re-used in the work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable. Apply new form coating compound material to concrete contact surfaces as specified for new formwork.
- D. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close all joints. Align and secure joints to avoid offsets.

3.11 FORM REMOVAL

- A. Do not loosen or remove forms before minimum curing period has elapsed without employment of appropriate alternate curing methods, approved by the Architect in writing.
- B. Remove forms without damage to the concrete using means to insure complete safety of the structure and without damage to exposed beams, columns, wall edges, chamfers and inserts. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
- C. Do not remove forms until the concrete has hardened sufficiently to permit safe removal and the concrete has attained sufficient strength to safely support imposed loads. The minimum elapsed time for removal of forms after concrete has been placed shall be as follows:
 - 1. Walls: 7 days, provided members are not subjected to overhead loads.
 - 2. Retaining Walls: 21 days minimum.
 - 3. Footings: 7 days minimum. If backfilled immediately, side forms may be removed 24 hours after concrete is placed.
 - 4. Elevated slabs, and similar overhead conditions: 28 days unless adequate shoring is provided.

- D. Durations listed above are minimums and are subject to extension at the sole judgment of the Architect/Engineer.
- E. Reshoring: Reshore members where and if required by Formwork Design Engineer.
- F. Do not subject concrete to superimposed loads (structure or construction) until it has attained full specified design strength, nor for a period of at least 14 days after placing.
- G. Store removed forms to prevent damage to form materials or to fresh concrete. Discard damaged forms.

3.12 CLEANING

- A. Remove excess material and debris associated with this work from the job site.

END OF SECTION

HGA
PROJECT #4952-002

06/05/2024
DSA SPC_V2

BUILDING 3000
MAINTENANCE OPERATIONS
WAREHOUSE & GARAGE
DSA 01-121159

BLANK PAGE

SECTION 03 20 00
CONCRETE REINFORCING

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Reinforcing steel work for all concrete and masonry work as indicated on the drawings and specified herein.
 - 2. Coordinate this work with other work affected by these operations, such as forms, electrical work, mechanical work, structural steel, masonry and concrete.
- B. Related Sections:
 - 1. Pertinent Sections of Division 01 specifying Quality Control and Testing Laboratory services.
 - 2. Pertinent Sections of Divisions 03 specifying concrete construction.
 - 3. Pertinent Sections of Divisions 04 specifying masonry construction.
 - 4. Pertinent Sections of other Divisions specifying work to be embedded in concrete or work penetrating concrete work.

1.2 REFERENCE STANDARDS

- A. California Code of Regulations, Title 24, latest adopted edition (herein noted as CBC) Chapter 19A Concrete.
- B. American Concrete Institute (ACI) 301 “Specifications for Structural Concrete for Buildings”.
- C. ACI 318 “Building Code Requirements for Reinforced Concrete and Commentary”.
- D. ACI SP-066 “ACI Detailing Manual”.
- E. American Society for Testing and Materials (ASTM) A1064 “Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete”.
- F. ASTM A615 “Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement”.
- G. ASTM A706 “Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement”.
- H. American Welding Society (AWS) D1.4 – “Structural Welding Code for Reinforcing Steel”.
- I. Concrete Reinforcing Steel Institute (CRSI) “Manual of Standard Practice”.

1.3 SUBMITTALS

- A. Submit in accordance with pertinent sections of Division 01 specifying submittal procedures. Submit for review prior to fabrication.

- B. Limitation of Review: Structural Engineer's review will be for general conformance with design intent as indicated in the Contract Documents and does not relieve Contractor of full responsibility for conformance with the Contract Documents. The General Contractor shall review and approve shop drawings prior to submittal to the Architect/Engineer.
- C. Shop Drawings: Show complete fabrication and placing details of all reinforcing steel. Comply with requirements of ACI SP-66. Include:
 - 1. Bar sizes and schedules;
 - 2. Shapes of bent bars, layout and spacing of bars, location of splices.
 - 3. Stirrup spacing, arrangements and assemblies,
 - 4. References to Contract Document detail numbers and designations.
 - 5. Wall elevations corresponding to elevations shown in Contract Documents.
- D. Product Data: Submit manufacturer's product data, specifications, location and installation instructions for proprietary materials and reinforcement accessories. Provide samples of these items upon request.
- E. Certificates: Submit all certifications of physical and chemical properties of steel for each heat number as manufactured, including location of material in structure as specified below in Article titled QUALITY ASSURANCE. All materials supplied shall be tagged with heat numbers matching submitted Mill Test Report analyses.
- F. Samples: Provide to the Owner's Testing laboratory as specified in Article SOURCE QUALITY CONTROL.

1.4 QUALITY ASSURANCE

- A. Perform work of this Section in accordance with CRSI DA4, CRSI P1, ACI 301, and ACI 318.
- B. Requirements of Regulatory Agencies, refer to pertinent Sections of Division 01 and CBC.
- C. Certification and Identification of Materials and Uses: Provide Owner's Testing Agency with access to fabrication plant to facilitate inspection of reinforcement. Provide notification of commencement and duration of shop fabrication in sufficient time to allow inspection and all material identification/test information listed below.
 - 1. Provide manufacturer's Mill Test Reports for all materials. Include chemical and physical properties of the material for each heat number manufactured. Tag all fabricated materials with heat number.
 - 2. Provide letter certifying all materials supplied are from heat numbers covered by supplied mill certificates. Include in letter the physical location of each grade of reinforcing and/or heat number in the project (i.e. foundations, walls, etc.).
 - 3. Unidentified Material Tests: Where identification of materials by heat number to mill tests cannot be made, Owner's Testing Agency shall test unidentified materials as described below.
- D. Testing and Inspection: Tests and Inspections required by Independent Testing Agency are specified below in Articles SOURCE QUALITY CONTROL and FIELD QUALITY CONTROL. Duties and limitations of Independent Testing Agency, test costs and test reports in conformance with pertinent Sections of Division 01.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Comply with pertinent requirements of Division 01.

- B. Deliver reinforcement to project site in bundles marked with durable tags indicating heat number, mill, bar size and length, proposed location in the structure and other information corresponding with markings shown on placement diagrams.
- C. Handle and store materials above ground to prevent damage, contamination or accumulation of dirt or rust.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Reinforcing Steel: Deformed billet steel bars, ASTM A706 Grade 60 or ASTM A615 Grade 60.
 - 1. Welded reinforcement shall be ASTM A706, or A615 meeting carbon requirements of AWS D1.4. Welding shall conform with AWS D1.4.
 - 2. All reinforcement to be unfinished.
- B. Welded Wire Reinforcement: ASTM A1064.
- C. Tie Wire: No. 16 AWG or heavier, black annealed.
- D. Concrete Blocks: On-grade conditions only, as required to support reinforcing bars in position.
- E. Reinforcing Supports: Plastic or galvanized steel chairs, bolsters, bar supports, or spacers sized and shaped for adequate support of reinforcement and construction loads imposed during concrete placement, meeting ACI and CRSI standards.
 - 1. For use over formwork: Galvanized wire bar type supports complying with CRSI recommendations. Provide plastic tips where exposed to view or weather after removal of formwork. Do not use wood, brick, or other unacceptable materials.
- F. Reinforcement Splice Couplers: For use only where specified on drawings. Submit other locations proposed for use to Engineer for review. "L-Series Bar Lock" Coupler Systems for Splicing Reinforcement Bars, UES ER-0319, by Dayton-Superior Corporation.

2.2 FABRICATION

- A. Fabricate concrete reinforcing in accordance with CRSI (DA4), unless specifically shown otherwise. Details not specifically shown or indicated shall conform to SP-066 and specified codes and standards.
 - 1. Accurately shop-fabricate to shapes, bends, sizes, gauges and lengths indicated or otherwise required.
 - 2. Bend bars once only. Discard bars improperly bent due to fabricating or other errors and provide new material; do not re-bend or straighten unless specifically indicated. Rebending of reinforcement in the field is not allowed.
 - 3. Do not bend reinforcement in a manner that will injure or weaken the material or the embedding concrete.
 - 4. Do not heat reinforcement for bending. Heat-bent materials will be rejected.
- B. Unacceptable materials: Reinforcement with any of the following defects will not be permitted in the work.
 - 1. Bar lengths, depths and bends exceeding specified fabrication tolerances.
 - 2. Bends or kinks not indicated on Drawings or final shop drawings.

3. Bars with reduced cross-section due to rusting or other cause.
- C. Tag reinforcement with durable identification to facilitate sorting and placing.
- D. Shop Fusion Welded Stirrup/Tie/Spiral Cages
 1. Shop fusion welding of stirrup/tie/spiral cages is permitted to aid in fabrication and handling. The following requirements shall be met.
 2. All reinforcing bars receiving weld shall be ASTM A706.
 3. Longitudinal holding wires shall be ASTM A1064.
 4. Shop welding shall be performed by machines under a continuous, controlled process.
 5. Quality control tests shall be performed on shop-welded specimens and the test results shall be available, upon request, to the Architect/Engineer.
 6. Tack welding of reinforcing steel is not permitted.
 7. Welding of any type shall not occur at 90°, 135°, or 180° bends. Circular ties and spirals may be shop fusion welded outside of areas with 90°, 135°, or 180° hook bends.
 8. Longitudinal bars shall not be welded to stirrups/ties/spirals.

2.3 SOURCE QUALITY CONTROL

- A. The Testing Agency, as specified in the Article QUALITY ASSURANCE, will perform the following:
 1. Sampling and Tests of Reinforcing Bars per CBC 1910A.2.
 2. Material Testing:
 - a. Identified Steel: When samples are taken from bundled steel identified by heat number, matched with accompanying mill analyses as delivered from the mill, Owner's Testing Agency will perform one tensile test and one bend test per each ten tons or fraction thereof for each required size of reinforcing steel.
 - b. Unidentified Steel: When identification of materials by heat number matched to accompanying mill analyses cannot be made, perform one tensile test and one bend test per each two and one-half tons or fraction thereof for each required size of reinforcing steel. Tests of unidentified steel shall be performed by the Owner's Testing Agency and costs for these tests shall be paid by the Contractor by deductive change order.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Inspect the conditions under which concrete reinforcement is to be placed. Do not proceed with the work until unsatisfactory conditions have been corrected.
- B. Coordinate with work of other sections to avoid conflicts or interference. Bring conflicts between reinforcement and other elements to Architect's attention. Resolve conflicts before concrete is placed.
- C. Notify Architect, Structural Engineer, and Authority Having Jurisdiction for review of steel placement not less than 48 hours before placing concrete.

3.2 PLACEMENT

- A. General: Comply with the specified codes and standards, and Concrete Reinforcing Steel Institute recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as herein specified.
- B. Clean bars free of substances which are detrimental to bonding. Maintain reinforcement clean until embedded in concrete.
- C. Place reinforcement to obtain the minimum coverages for concrete protection. Do not deviate from required position. Maintain required distance, spacing and clearance between bars, forms, and ground.
- D. Location and Support: Provide metal chairs, runners, bolsters, spacers and hangers, as required.
- E. Provide additional steel reinforcement as necessary or as directed, to act as spreaders or separators to maintain proper positioning.
- F. Tying and Attachment: Securely tie at all intersections and supports with wire. Prevent dislocation or movement during placement of concrete. Direct twisted ends of wire ties away from exposed concrete surfaces.
- G. Separate reinforcing from pipes or conduits with approved non-metallic separators. Do not use wood or steel form stakes or reinforcement used as stakes as support for reinforcement.
- H. Accommodate placement of formed openings required by other sections.
- I. Obstructions:
 - 1. Where obstructions, block-outs, or penetrations (conduits, raceways, ductwork) prevent continuous placement of reinforcement as indicated, provide additional reinforcing as detailed and as directed by the Structural Engineer to supplement the indicated reinforcement around the obstruction.
 - 2. Place additional trim bars, ties, stirrups, or other elements as detailed and as directed at all opening, sleeves, pipes or other penetrations through structural elements.
- J. Welded Wire Reinforcement: Reinforce slabs with 6"x 6"-W1.4 x W1.4 welded wire reinforcement reinforcing, unless otherwise noted on drawings.
 - 1. Provide flat sheets only, no rolls. Straighten, cut to required size, and lay out flat in place.
 - 2. Securely wire-tie reinforcement to other reinforcement at frequent intervals.
 - 3. Extend reinforcement over supporting beams and walls, and to within 1 inch of edge of slabs, construction joints, and expansion joints.
 - 4. Support reinforcement in mid-depth of slab.
 - 5. Lift reinforcement at intervals as slab concrete is placed, ensure proper embedment

3.3 REINFORCING SPACING AND COVERAGE

- A. Spacing: Do not space bars closer than four (4) diameters of the largest of two adjacent bars, except at bar laps, which shall be placed such that a minimum of 2 bar diameters is clear between bars.
- B. Where reinforcing in members is placed in two layers, the distance between layers shall not be less than four bar diameters of the largest bar and the bars in the upper layers

shall be placed directly above those in the bottom layer, unless otherwise detailed or dimensioned.

- C. Coverage of bars (including stirrups and columns ties) shall be as follows, unless otherwise shown:
1. Footings and Mat Foundation: 3 inches to any soil face, 2 inches to top.
 2. Slabs (on grade): 2 inches to grade face, 1-1/2 inches to top face.
 3. Slabs (elevated): 1-1/2 inches top and bottom.
 4. Beam & Column: 1-1/2 inches to form.
 5. Walls: 1-1/2 inches clear to form and 2 inches clear to form at soil face.

3.4 DOWELS, SPLICES, OFFSETS AND BENDS

- A. Provide standard reinforcement splices at splices, corners, and intersections by lapping ends, placing bars in contact, and tightly tying with wire at each end. Comply with details shown on structural drawings and requirements of ACI 318.
- B. Provide minimum 1-1/2 inch clearance between sets of splices. Stagger splices in horizontal bars so that adjacent splices will be 4 feet apart.
- C. Laps of welded wire reinforcement shall be at least two times the spacing of the members in the direction lapped but not less than twelve inches.
- D. Splices of reinforcement shall not be made at points of maximum stress. Provide splice lengths as noted on the structural drawings, with sufficient lap to transfer the stress between bars by bond and shear.
- E. Spacing:
1. Space bars minimum distance specified and all lapped bars 2 bar diameters (minimum) clear of the next bar.
 2. Stagger splices of adjacent bars where possible and where required to maintain bar clearance.
 3. Beam or slab top bars shall be spliced mid-span of column support and bottom bars spliced at column supports.
 4. Request Architect/Engineer review prior to placement for all splices not shown on the drawings.
- F. Reinforcement Couplers: Install at all locations indicated. Install couplers in accordance with manufacturer's recommendations.

3.5 WELDING

- A. No reinforcing shall be welded unless specifically indicated. No reinforcing shall be welded without prior approval of the Structural Engineer and the Authority Having Jurisdiction.
- B. Only when so approved for use as noted above, all welding shall conform to AWS D1.4, ACI 318 Section 26.6.4, and CBC 1903A.8 and the following:
1. All welding performed by certified welders.
 2. All reinforcement requires preheat prior to welding. All preheat and welding shall be continuously inspected by the Testing Agency.

3.6 MISPLACED REINFORCEMENT

- A. Notify Architect/Engineer immediately if reinforcing bars are known to be misplaced after concrete has been placed.
- B. Perform no correction or cutting without specific direction. Do not bend or kink misplaced bars.
- C. Correct misplaced reinforcing only as directed in writing by the Architect/Engineer. Bear all costs of redesign, new, or additional reinforcing required because of misplaced bars at Contractor's expense.

3.7 FIELD QUALITY CONTROL

- A. The Testing Agency as specified in the Article QUALITY ASSURANCE, will inspect the work for conformance to contract documents before concrete placement.
 - 1. Inspection: Provide inspection and verification of installed reinforcement. Confirm that the surface of the rebar is free of form release oil or other coatings.
 - 2. Inspect all preheat and welding activities for steel reinforcement, when these occur.
 - 3. Exception: Non-structural patios, driveways, and sidewalks do not require special inspection.

3.8 CLEANING

- A. Remove excess material and debris associated with this work from the job site.

END OF SECTION

HGA
PROJECT #4952-002

06/05/2024
DSA SPC_V2

BUILDING 3000
MAINTENANCE OPERATIONS
WAREHOUSE & GARAGE
DSA 01-121159

BLANK PAGE

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes: Provide all labor, materials, equipment and services to complete all concrete work required, including, but not limited to, the following:
1. Foundations, beams, columns, elevated slabs, slabs-on-grade, walls, and retaining walls.
 2. Installation of all bolts, inserts, sleeves, connections, etc. in the concrete.
 3. Joint devices associated with concrete work.
 4. Miscellaneous concrete elements, including, but not limited to: equipment pads, light pole bases, flagpole bases, thrust blocks, and manholes.
 5. Concrete curing.
 6. Coordination with other sections:
 - a. Make all preparations and do all work necessary to receive or adjoin other work. Install all bolts and anchors, including those furnished by other sections, into formwork and provide all required blocking.
 - b. Install all accessories embedded in the concrete and provide all holes, blockouts and similar provisions necessary for the work of other sections. Provide all patching or cutting made necessary by failure or delay in complying with this requirement at the Contractor's expense.
 - c. Coordinate with other sections for the accurate location of embedded accessories.
- B. Related Sections:
1. Pertinent Sections of Division 01 specifying Quality Control and Testing Laboratory services.
 2. Pertinent Sections of Division 03 specifying concrete construction.
 3. Pertinent Sections of other Divisions specifying work to be embedded in concrete or work penetrating concrete.
 4. Pertinent sections of other Divisions specifying floor finishes and sealants applied to concrete substrates.

1.2 REFERENCES

- A. California Code of Regulations, Title 24, latest adopted edition (herein noted as CBC) Chapter 19A Concrete.
- B. American Concrete Institute (ACI) 211.1 "Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete"; ACI 211.2 "Standard Practice for Selecting Proportions for Lightweight Concrete".
- C. ACI 301 "Specifications for Structural Concrete".
- D. ACI 302.1R "Guide for Concrete Floor and Slab Construction".
- E. ACI 304R "Guide for Measuring, Mixing, Transporting, and Placing Concrete".
- F. ACI 305R "Hot Weather Concreting".

- G. ACI 306R "Cold Weather Concreting".
- H. ACI 308 "Standard Practice for Curing Concrete".
- I. ACI 318 "Building Code Requirements for Reinforced Concrete and Commentary".

1.3 SUBMITTALS

- A. Submit in accordance with pertinent sections of Division 01 specifying submittal procedures. The General Contractor shall review and approve shop drawings prior to submittal to the Architect/Engineer. Submittals that do not meet these requirements will be returned for correction without review. Submit for review prior to fabrication.
- B. Limitation of Review: Structural Engineer's review will be for general conformance with design intent as indicated in the Contract Documents and does not relieve Contractor of full responsibility for conformance with the Contract Documents.
- C. Product Data: Submit manufacturers' data on manufactured products and other concrete related materials such as bond breakers, cure/sealer, admixtures, etc. Demonstrate compliance with specified characteristics. Provide samples of items upon request. Submit material certificates for concrete aggregates and cementitious materials. Certificates shall show compliance to applicable ASTM's, the CBC, and additional requirements stated herein.
- D. Mix Designs: Submit Mix Designs for each structural concrete type required for work per requirements of articles CONCRETE MIXES and QUALITY ASSURANCE. Resubmit revised designs for review if original designs are adjusted or changed for any reason. Non-Structural mixes need not be submitted for review by Structural Engineer.
- E. Shop Drawings: Proposed location of construction and cold joints. Proposed location of all slab construction/dowel joints, control joints, and blockouts.
- F. Manufacturer's Installation Instructions: Indicate installation procedures and interface required with adjacent construction for concrete accessories.
- G. Batch Plant Certificates: Include with delivery of each load of concrete. Provide Certificates to the Testing Agency and the Architect/Engineer as separate submittals. Concrete delivered to the site without such certificate shall be rejected and returned to the plant. Each certificate shall include all information specified in Article SOURCE QUALITY CONTROL below.
- H. Engineering Analysis: Prepared by a California-licensed Civil or Structural Engineer, justifying construction-imposed loads on slabs, beams, and walls which exceed those allowed by CBC for the specified use.
 - 1. 2000 lbs maximum allowable construction load without analysis.
 - 2. 10,000 lbs maximum allowable construction load with analysis.
- I. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

1.4 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
- B. Concrete construction verification and inspection to conform to CBC 1705A.3.

- C. Common Sourcing: Provide each of the following materials from consistent sources for entire project.
 - 1. Cement.
 - 2. Fly ash.
 - 3. Aggregate.
 - 4. Ground Granulated Blast Furnace Slag.
- D. Follow recommendations of ACI 305R when concreting during hot weather. Follow recommendations of ACI 306R when concreting during cold weather.
- E. Services by the Independent Testing Agency (includes "Special" Inspections) as specified in this Section and as follows:
 - 1. Perform tests and inspections specified below in articles SOURCE QUALITY CONTROL and FIELD QUALITY CONTROL. Duties and limitations of Independent Testing Agency, test costs and reports to be in conformance with pertinent Sections of Division 01.
- F. Contractor shall bear the entire cost of remediation, removal, and/or replacement of concrete determined defective or non-conforming, including Architect/Engineer fees for redesign.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Materials specified by brand name shall be delivered in unbroken packages bearing manufacturer's label and shall be brand specified or an approved equal.
- B. Delivery, Handling and Storage of other materials shall conform to the applicable sections of the current editions of the various reference standards listed in this Section.
- C. Protect materials from weather or other damage. Sort to prevent inclusion of foreign materials.
- D. Specific Requirements:
 - 1. Cement: Protect against dampness, contamination, and warehouse set. Store in weather tight enclosures.
 - 2. Aggregates: Prevent excessive segregation, or contamination with other materials or other sizes of aggregates. Use only one supply source for each aggregate stock pile.
 - 3. Admixtures:
 - a. Store to prevent contamination, evaporation, or damage.
 - b. Protect liquid admixtures from freezing and extreme temperature ranges.
 - c. Agitate emulsions prior to use.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Cold Weather (Freezing or near-freezing temperatures) per ACI 306R:
 - 1. Heat concrete materials before mixing, as necessary to deposit concrete at a temperature of at least 50°F but not more than 90°F.
 - 2. Do not place concrete during freezing, near-freezing weather, snow, rain or sleet unless protection from moisture and/or cold is provided.
 - 3. Protect from freezing and maintain at a temperature of at least 50°F for not less than seven days after placing. Take special precautions to protect transit-mixed concrete.
 - 4. No salts, chemical protection or admixture are permitted without written approval of Architect/Engineer.

5. Contractor shall maintain an air temperature log for the first 7 days after placement with entry intervals not to exceed 8 hours.
- B. Hot Weather per ACI 305R:
1. Cool concrete materials before mixing, or add ice in lieu of mix water as necessary to deposit concrete at a temperature below 85°F.
 2. Do not place concrete in hot/windy weather without Architect/ Engineer review of procedures.
 3. Provide sunshades and/or wind breakers to protect concrete during finishing and immediate curing operations. Do not place concrete at air temperature exceeding 90°F.
 4. Provide modified mix designs, adding retarders to improve initial set times and applying evaporation reducers during hot/windy weather for review by Independent Testing Agency prior to use.

1.7 MOCK-UP

- A. Construct and erect mock-up panel for architectural concrete surfaces indicated to receive special treatment or finish, as result of formwork.
1. Panel Size: Sufficient to illustrate full range of treatment.
 2. Number of Panels: 2.
 3. Locate as indicated on drawings.
- B. If requested by Architect / Engineer, cast concrete against mock-up panel. Obtain acceptance of resulting surface finish prior to erecting formwork.
- C. Accepted mock-up panel is considered basis of quality for the finished work. Keep mock-up exposed to view for duration of concrete work.
- D. Mock-up may remain as part of the Work.

1.8 SCHEDULING AND SEQUENCING

- A. Organize the work and employ shop and field crew(s) of sufficient size to minimize inspections by the Testing Agency.
- B. Provide schedule and sequence information to Testing Agency in writing upon request. Update information as work progresses.

PART 2 – PRODUCTS

2.1 FORMWORK

- A. Comply with requirements of Section 03 1000.

2.2 REINFORCEMENT

- A. Comply with requirements of Section 03 2000.

2.3 MATERIALS

- A. General Requirements: All materials shall be new and best of their class or kind. All materials found defective, unsuitable, or not as specified, will be condemned and promptly removed from the premises.
- B. Cementitious Materials:
 - 1. Portland Cement: ASTM C150, Type II, low alkali.
 - 2. Fly Ash (Pozzolan): ASTM C618, Class F.
 - 3. Ground Granulated Blast Furnace Slag: ASTM C989, Grade 100 or 120.
- C. Concrete Aggregates:
 - 1. Coarse and Fine Aggregates: ASTM C33; Stone aggregate and sand. Specific source aggregate and/or sand or shrinkage characteristics as required for class of concrete specified.
 - 2. Lightweight aggregate: ASTM C330 and C332.
 - 3. Source shall remain constant throughout the duration of the job. The exact portions of the fine aggregates and coarse aggregates to be used in the mix shall be determined by the mix design.
 - 4. Aggregates shall be tested for alkali reactivity per CBC section 1903A.5. Where test results exceed allowable limits, additional testing of mitigation procedures shall be provided, as outlined per CBC section 1903A.5.
- D. Water: Potable, clean, from domestic source.
- E. Admixtures: All admixtures shall be used in strict accordance with the manufacturer's recommendations. Admixtures containing calcium chlorides or other accelerators shall not be used without the approval of the Architect/Engineer and the Owner's Testing Laboratory.
 - 1. Mid-Range Water Reducing Admixtures: ASTM C494 Type A, "MasterPolyHeed" (formerly "PolyHeed") series by Master Builders Solutions, "WRDA" series by W.R. Grace, or equal.
 - 2. High Range Water-Reducing Admixtures: ASTM C494 Type F, "MasterRheoBuild 1000" (formerly "RheoBuild 1000") or "MasterGlenium" (formerly "Glenium") series by Master Builders Solutions or equal.
 - 3. Water Reducing Admixture and Retarder: ASTM C494 Type B or D, "MasterPozzolith" (formerly "Pozzolith") series or "MasterSet DELVO" (formerly "DELVO") series by Master Builders Solutions, "Plastiflow-R" by Nox-crete, or equal.
 - 4. Air Entraining Admixtures: ASTM C260, product suit condition by Master Builders Solutions or equal.
 - 5. Viscosity Modifiers: ASTM C494 Type S.
- F. Slurry: Same proportion of cement to fine aggregates used in the regular concrete mix (i.e. only coarse aggregate omitted); well mixed with water to produce a thick consistency.
- G. High Strength Grout: See section 05 1200 or 05 1100 for requirements.
- H. Dry Pack: Dry pack (used only for cosmetic concrete repairs) shall consist of:
 - 1. One part cement to 2-1/2 parts fine aggregate (screen out all materials retained on No.4 sieve), mixed with a minimum amount of water, added in small amounts.
 - 2. Mix to consistency such that a ball of the mixture compressed in the hand will retain its shape, showing finger marks, but without showing any surface water.

2.4 ACCESSORIES

- A. Bonding Agent: ASTM C881, Type II Grade 2 Class B or C. Do not allow epoxy to set before placing fresh concrete.

1. "MasterEmaco ADH 326" (formerly "Concresive Liquid LPL") by Master Builders Solutions;
 2. "Rezi-Weld 1000" by W.R. Meadows.
- B. Chemical Hardener: Fluorosilicate solution designed for densification of cured concrete slabs. "MasterKure HD 300 WB" (formerly "Lapidolith") by Master Builders Solutions, "LIQUI-HARD" W.R. Meadows Co, or equal.
- C. Moisture-Retaining Cover: ASTM C171, type 1, one of the following:
1. Regular Curing Paper, Type I, reinforced waterproof: Fortifiber Corporation "Orange Label Sisalkraft", "Pabcotite" paper, or equal.
 2. Polyethylene Film: ASTM D 2103, 4 mil thick, clear or white color.
 3. White-burlap-polyethylene sheet, weighing not less than 10 oz/per linear yd.
- D. Liquid Curing Compound: ASTM C 309, Type 1, Class B, clear or translucent, 25% minimum solids, water base acrylic cure/sealer which will not discolor concrete and compatible with bonding of finishes specified in related sections. W.R. Meadows Co. "Vocomp 25" or equal. Maximum VOC content shall comply with local requirements and California Green Building Code.
- E. Under Slab Water Vapor Retarder: Vapor retarder sheet to be ASTM E1745 Class A; 15 mil, single ply extruded polyolefin; permeance no greater than 0.01 U.S. Perms per ASTM E154, ASTM E96 procedure B or ASTM F1249.
1. "Stego Wrap Vapor Barrier (15mil)" by Stego Industries LLC.
 2. "Vaporguard" by Reef Industries.
 3. Approved Equal.
- F. Evaporation Reducer: "MasterKure ER 50" (formerly Confilm), by Master Builders Solutions.
- G. Permeability Reducer: Use only where specifically referred to.
1. Admixture Type: Xypex Chemical Corporation "XYPEX Admix C-500". Dosage: 2-3% of cement content by weight; 15 lb/cu. yd. max. or Master Builders Solutions "MasterLife 300D" (formerly "Rheomac 300D"). Dosage: 2% of cement content by mass.
 2. Surface-Applied Type: Xypex Chemical Corporation "XYPEX Concentrate. Brush application: 1.25-1.50lb/sq. yd., 5 parts powder to 2 parts water. Master Builders Solutions "MasterSeal 500" (formerly "Tegraproof"). Slurry coat: one part water to 2.25-2.5 parts powder by volume.
 3. Approved equal.

2.5 JOINT DEVICES AND MATERIALS

- A. Waterstops: Resilient type, meeting Corps of Engineers CRD-C 572. Consult manufacturer for appropriate product for specific use. Submit for review. Install per manufacturers recommendation. Provide W. R. Meadows "Seal Tight" PVC waterstop, Sika "Greenstreak" PVC waterstop, or approved equal.
- B. Expansion Joint Filler: ASTM D1751, Nonextruding, resilient asphalt impregnated fiberboard or felt, 3/8 inch thick and 4 inches deep; tongue and groove profile.
1. Products: "Servicised Products", W.R. Meadows, Inc., "National Expansion Joint Company", "Celotex Corporation", or equal.
- C. Joint Filler: ASTM D944, Compressible asphalt mastic with felt facers, 1/4 inch thick and 4 inches deep.
- D. Sealant and Primer: As specified in Section 07 9000.

- E. Slab Joint Sealant: Compatible with floor finishes specified in related sections.

2.6 CONCRETE MIXES

- A. General requirements for mix design and submittal of structural class concrete:
1. Provide Contractor submittals to Architect/Engineer not less than 15 days before placing concrete.
 2. Contractor shall review mix designs and proposed placing requirements prior to submittal for compatibility to ensure that the concrete as designed can be placed in accordance with the drawings and specifications.
 3. Changes or revisions require re-submittal: All variations to approved mix designs, including changing type and/or quantity of admixtures shall be resubmitted to the Architect/Engineer for review prior to use.
 4. Mix design(s) for all structural classes of concrete to be prepared by qualified person experienced in mix design. Allow for time necessary to do trial batch testing when required.
 5. Preparer to provide backup data and certify in writing that mix design meets:
 - a. Requirements of the specifications for concrete durability and quality;
 - b. Requirements of the California Building Code and ACI 318 Section 26.4, including break histories, trial batching test results, and/or a mix designed by a California Registered Civil Engineer per ACI 318 Section 26.4.3.1(b) and bearing the Engineer's seal & signature.
 6. Clearly note on mix designs with specified maximum WCR if design permits addition of water on site, or clearly identify in the mix design that no water is to be added on site.
 7. Deviations: Clearly indicate proposed deviations, and provide written explanation explaining how the deviating mix design(s) will provide equivalent or better concrete product(s) than those specified.
 8. Include adjustments to reviewed mix designs to account for weather conditions and similar factors.
- B. Proportioning - General: The following provisions apply to all mix designs:
1. Proportion concrete mixes to produce concrete of required average strength (as defined by ACI 318 Section 19.2.1). Select slump, aggregate sizes, shrinkage, and consistency that will allow thorough compaction without excessive puddling, spading, or vibration, and without permitting the materials to segregate, or allow free water to collect on the surface.
 2. Select aggregate size and type to produce dense, uniform concrete with low to moderate shrinkage, free from rock pockets, honeycomb and other irregularities.
 3. Mix designs may include water reducing and retarding admixtures to meet or exceed minimum set times (time required to place and finish) and to minimize Water Cement Ratios (WCR). Minimum and maximum criteria presented in this section are guidelines and do not represent a specific mix design.
 4. Cement Content: Minimum cement content indicates minimum sacks of cementitious material. Increasing cement content to increase early strengths or to achieve specified WCR while maintaining water content is discouraged in order to minimize effects of shrinkage.
 - a. Substitution of fly ash for Portland cement on an equivalent weight basis up to 25% replacement is permitted, except at high early strength concrete. Replacement in excess of 25% is not permitted unless part of a specified mix design that has been submitted for review.
 - b. Substitution of slag for Portland cement on an equivalent weight basis up to 45% replacement is permitted, except at high early strength concrete. Replacement in excess of 45% is not permitted unless part of a specified mix design that has been submitted for review.
 - c. Such substitution requests may be denied by the Engineer.

5. Water Content: Mix designs with a specified maximum Water Cement Ratio (WCR) may be designed with a lower WCR than specified in order to allow addition of water at the site.
 6. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301 and this section.
 - a. For trial mixtures method, employ independent testing agency acceptable to Architect/Engineer for preparing and reporting proposed mix designs.
 7. Placement Options: Mix designs may, at the Contractor's option, be designed for either pump or conventional placement with aggregate size, slumps, etc. to be maintained as specified in this section.
- C. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations and this section.
- D. Proportioning Structural Light Weight Concrete: Comply with ACI 211.2 recommendations and this section. Maximum cured weight of light weight concrete shall be 120 pounds per cubic feet. General Contractor is responsible for coordinating and providing light weight concrete density to meet the required fire assembly rating of the Construction Documents at the concrete depths provided in the structural drawings. General Contractor to notify the Structural Engineer for review if light weight concrete of the required density for the specified fire assembly rating cannot be sourced.
- E. Special mix design requirements for interior concrete floor slabs on grade:
1. Proportion concrete mixes per this specification, ACI 211.1, and the requirements below:
 2. Fly Ash Type F, shall be substituted for cement on a 1 lb. per 1 lb. basis, with a minimum replacement of 25% and a maximum of 35%. Alternatively, Slag Grade 100 or 120, shall be substituted for cement on a 1 lb. per 1 lb. basis, with a minimum replacement of 30% and a maximum of 45%.
 3. 200 lbs. of 3/8(-) aggregate shall be added to reduce total sand.
 4. Reduce total sand to minimum practical.
 5. Admixture dosage shall be per manufacturer's recommendations. Dosage may be increased for workability as long as set times are not excessive for placement and finishing.
- F. Special mix design requirements for high volume fly ash concrete:
1. Proportion concrete mixes per this specification, ACI 211.1, and the requirements below:
 2. Fly Ash Type F, shall be substituted for cement on a 1 lb. per 1 lb. basis, with a replacement of 50%.
 3. Minimum strength at 28 days to be 2500 psi; minimum strength at 56 days to be 3000 psi.
 4. Add 200-300 pounds 3/8" aggregate to replace portion of fine aggregate.
 5. Admixture dosage shall be per manufacturer's recommendations. Dosage may be increased for workability as long as set times are not excessive for placement and finishing.
 6. Concrete shall be wet cured per CONCRETE CURING.

G. Mix Design Minimum Requirements:

Concrete Class	Coarse Aggregate Size (Inches) & Fine Aggregate ³	Maximum WCR or Maximum Nominal Slump & Tolerance (Inches) ^{1,2}	Minimum 28-Day Design Strength	Minimum Cement Sacks/per yd ⁴
NON-STRUCTURAL				
1) Lean Concrete (use only where specified)	---	---	---	3.0
STRUCTURAL				
2) Interior Slab on Grade ⁵	1" x #4	WCR = .45	3,000	6.1
3) Foundation (including stem walls)	1" x #4	WCR = .53	4,000	5.0
4) Cast Slab Above Grade on Metal Deck	3/4" x #4	WCR = .53	3,000	5.0
5) Retaining Walls	1" x #4	WCR = .46	4,000	6.0

1. The tolerance is the maximum deviation allowable without rejection. The mix design shall be based on the nominal value specified and is without water reducing mixtures. Slump to be measured at the end of the hose.
2. The maximum water cement ratio (WCR) is limited at time of placement as noted. No water is to be added on site such that the specified WCR or maximum slump is exceeded without approval of the testing laboratory and the Architect/Engineer. Workability is to be achieved utilizing an acceptable mid-range to high range water reducing admixture.
3. Gradation of aggregate is per ACI 318 section 26.4.1.2 and ASTM C33.
4. Minimum cement content includes all cementitious materials.
5. See Article 2.6E for additional requirements at slabs on grade.
6. See article 2.6F for additional requirements at high volume fly ash concrete.

2.7 MIXING CONCRETE

- A. Batch final proportions in accordance with approved mix designs. All adjustments to approved proportions, for whatever reason, shall be reviewed by the Architect/Engineer prior to use.
- B. Batch and mix concrete in accordance with ASTM C94, at an established plant. Site mixed concrete will be rejected.
- C. Provide batch and transit equipment adequate for the work. Operate as necessary to provide concrete complying with specified requirements.
- D. Place mixed concrete in forms within 1-1/2 hours from the time of introduction of cement and water into mixer or 300 revolutions of the drum whichever comes first. Use of, re-mixing, and/or tempering mixed concrete older than 1 hour will not be permitted.
- E. Do not add water at the site to concrete mixes with a maximum specified WCR unless the water content at batch time provides for a WCR less than specified and this provision, including the quantity of water which may be added at the site, is specifically noted on the mix design and certification by the mix preparer. See ASTM C94 for additional requirements.

2.8 SOURCE QUALITY CONTROL

- A. Services by independent Testing Agency:
1. Where aggregate alkali reactivity testing (and, when applicable, mitigation testing) per the MATERIALS section is not available, the Testing Agency shall perform this testing to verify materials conformance to CBC section 1903A.5.
 2. Batch Plant inspection at automated plants to occur at commencement of concrete work each day (first truck). Batch Plant inspection at non-automated plants and when accuracy is questionable shall be continuous. Additionally, water cement ratio (WCR) is to be verified where a WCR is specified herein. The computed WCR is to be written on the Batch Plant Certificate to be taken to the job site prior to the truck leaving the plant. See requirements of CBC 1705A.3.3.
 3. Batch Plant Certificates: Obtain the weighmaster's Batch Plant Certificate at arrival of truck at the site. If no batch plant certificate is provided, recommend to the General Contractor that the truckload of concrete be rejected. So note in daily log, along with the location of the load of concrete in the structure if the load is not rejected. See requirements of CBC 1705A.3.3.
 - a. Laboratory's inspector shall obtain for each transit mixer Batch Plant Certificates to verify mix design quantities and condition upon delivery to the site.
 - b. Certificates to include: Date, time, ingredient quantities, water added at plant and on job, total mixer revolutions at time of placement, and time of departure.
 - c. Concrete with specified water cement ratio: Add no water on site unless mix design and batch records each show additional water may be added. See ASTM C94 for additional requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify lines, levels, and dimensions before proceeding with work of this section.
- B. Verify work of other sections is complete and tested as required before proceeding.

3.2 PREPARATION

- A. Observation, Inspection and Testing:
 1. Architect/Engineer: Notify not less than 2 working days before each concrete placement, for observation and review of reinforcing, forms, and other work prior to placement of concrete.
 2. Testing Agency: Notify not less than 24 hours before each placement for inspection and testing.
- B. Placement Records: Contractor shall maintain records of time, temperature and date of concrete placement including mix design and location in the structure. Retain records until completion of the contract. Make available for review by Testing Agency and Architect/Engineer.
- C. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.
- D. Verify location, position and inclusion of all embedded and concealed items.
- E. Verify installation of vapor retarder under interior slabs on grade, as specified in related section, is complete.

- F. Cleaning and Preparation:
1. Remove loose dirt, mud, standing water, and foreign matter from excavations and cavities.
 2. Close cleanout and inspection ports securely.
 3. Thoroughly clean reinforcement and other embedded items free from loose rust and foreign matter. Maintain reinforcing securely in place. Do not place concrete on hot reinforcing.
 4. Dampen form materials and substrates on which concrete is to be placed at least 1 hour in advance of placing concrete; repeat wetting as necessary to keep surfaces damp. Do not saturate. Do not place concrete on saturated material.
 - a. Thoroughly wet wood forms (except coated plywood), bottom and sides of trenches, adjacent concrete or masonry and reinforcement.
 - b. Concrete slabs on base rock, dampen rock.
 - c. Concrete slabs on vapor retarder, do not wet vapor retarder.
 5. Verify that metal forms are clean and free of rust before applying release agent.
 6. Thoroughly clean metal decking. Do not place concrete on wet deck surface.
 7. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.
- G. Drill holes in existing concrete at locations where new concrete is doweled to existing work. Insert steel dowels and prepare connections as detailed.
- H. Do not overcut at existing concrete work to remain. Contractor is responsible for repair/replacement of overcut concrete to the Owner's satisfaction.

3.3 PIPES AND CONDUITS IN CONCRETE

- A. Slabs-on-Grade:
1. No pipe or conduit exceeding 1 inch outside diameter shall be embedded within the specified slab thickness except as specifically detailed.
 2. Do not stack or abut pipes, maintain 3 inches minimum clearance.
- B. Sleeving and Wrapping:
1. Foundations: Sleeve or wrap all individual pipe penetrations, minimum 1-1/2 inches clear to reinforcing all around.
 - a. Sleeves: PVC. Provide 1 inch minimum clear all around O.D. pipe to I.D sleeve, UNO at ends, fill void space with mastic or plastic bituminous cement.
 - b. Wrapped Vertical Pipes: Provide 1/8 inch nominal sheet foam with three wraps minimum, UNO.
 - c. Wrapped Horizontal Pipes: Provide 1/8 inch nominal sheet foam with eight wraps minimum, UNO.
 - d. Underground Fire Lines 4" and Larger: At sleeves provide 2 inch minimum clear all around O.D. pipe to I.D sleeve. At wrapped pipes, provide 1/8 inch nominal sheet foam with sixteen wraps minimum.
 2. Slabs or Curbs: Wrap pipes as described above.
- C. Space groups of pipes/conduits at least 3 sleeve diameters apart, do not interrupt specified concrete and reinforcement.
1. Provide block-outs as detailed when grouping of pipes/conduits in foundation or other structural member prevents spacing as described. Notify Architect/Engineer for review of any conditions not conforming to details.
 2. Center pipe/conduit penetrations in the depth and/or thickness of foundations.
 3. Maximum size of pipe/conduit penetrations shall not exceed the least dimension of concrete divided by 3.

- D. Do not embed pipes/conduits in concrete slabs on metal deck.
- E. Provide the following at pipes/conduits detailed to be embedded in a concrete beam, wall or column:
 - 1. Place as near as possible to center of member with reinforcing as specified on each side.
 - 2. Where reinforcing is located near or at center of member, place pipe or conduit 1 inch minimum clear from reinforcing and provide #3 at 12 inches on center perpendicular to the pipe/conduit. Reinforcing to extend 12 inches minimum past pipe/conduit each side.
 - 3. Maintain $\frac{3}{4}$ inch clear minimum from added reinforcing to face of concrete where not exposed to weather and 1-1/2 inches clear where exposed to weather.
 - 4. Space embedded items (groups of pipe/conduit, junction boxes or other elements) minimum 3 inches apart.
 - 5. Provide reinforcing in walls, beams, columns as detailed for groups of pipe/conduit. Provide minimum replacement reinforcement of same size and number for interrupted or displaced reinforcement for the full height, length, width of the wall, beam, and/or column on each side of the "effective opening."

3.4 CONCRETE PLACEMENT

- A. Transporting:
 - 1. Provide clean, well-maintained equipment of sufficient quantity and capacity to execute the work and produce concrete of quality specified.
 - 2. Handle and transport concrete from mixer to final deposit location as rapidly as practicable. Prevent separation or loss of ingredients.
- B. Perform concrete placement by methods which will not puncture, damage or disturb vapor retarder membrane. Repair all damage to vapor retarder membrane before covering.
- C. Placement - General: Placement, once started, shall be carried on as a continuous operation until section of approved size and shape is completed. Provide construction joints as detailed on the drawings. Engineer's written approval required for all deviations.
 - 1. Deposition:
 - a. Deposit concrete to maintain an approximately horizontal plastic surface until the completion of the unit placement.
 - b. Deposit as neatly as practicable in final position, minimize re-handling or flow.
 - c. Do not drop concrete freely where reinforcing bars, embeds, or obstructions occur that may cause segregation. Provide spouts, elephant trunks, or other means to prevent segregation during placement.
 - 2. Depth: Layered placement in columns and walls shall not exceed ten feet vertical depth.
 - a. Place concrete in minimum 32 inch horizontal lifts.
 - b. Schedule placement to ensure that concrete will not take initial set before placement of next lift.
 - c. No horizontal cold joints are allowed in columns or walls.
 - 3. Progress Cleaning: Remove all concrete spilled on forms or reinforcing steel in portions of structure not immediately concreted. Remove completely before concrete sets.
 - 4. Interruptions: Shut down placement operations and dispose of all remaining mixed concrete and concrete in hoppers or mixers following all interruption in placement longer than 60 minutes.
 - a. If such interruption occurs, provide new or relocate existing construction joints as directed by Engineer.

- b. Cut concrete back to the designated line, cleaning forms and reinforcing as herein specified.
 - c. Prepare for resumption of placement as for new unit when reason for interruption is resolved.
- D. Placement - Elevated Structural Systems: Place as noted for "General" above and as follows:
- 1. Metal Decking and Structural Steel Beam Systems that are not to be shored: Locate screed lines on primary structural members. Review proposed screed line locations and expected structural deflections with the Architect/Engineer prior to placement of concrete.
 - 2. Place screed lines to match camber of primary girders made of material other than concrete. Locate screeds to provide the minimum specified thickness of concrete at all locations.
 - 3. Compensate for deflection of intermediate structural members and decking by placement of additional concrete.
 - 4. Adjust embedded items to compensate for camber and deflection. Maintain locations within specified tolerances.
- E. Consolidation:
- 1. Consolidate all concrete thoroughly during placement with high-speed mechanical vibrators and other suitable tools. Perform manual spading and tamping to work around reinforcement, embedded fixtures, and into corners of formwork as required to obtain thorough compaction.
 - a. Provide vibrators with sufficient amplitude for adequate consolidation.
 - b. Use mechanical vibrators at each point of concrete placement.
 - c. Keep additional spare vibrators, in addition to those required for use, at the site for standby service in case of equipment failure.
 - 2. Consolidate each layer of concrete as placed.
 - a. Insert vibrators vertically at points 18 to 30 inches apart; work into top area of previously placed layer to reconsolidate, slowly withdraw vibrator to surface.
 - b. Avoid contact of vibrator heads with formwork surfaces.
 - c. Systematically double back and reconsolidate wherever possible. Consolidate as required to provide concrete of maximum density with minimized honeycomb.
- F. Unacceptable Materials:
- 1. Do not place concrete that has started to set or stiffen. Dispose of these materials.
 - 2. Do not add water on site to concrete except as specified in the approved mix design, see PART 2 above.
- G. Protection of installed work:
- 1. Do not introduce any foreign material into any specified drainage, piping or duct systems.
 - 2. Contractor shall bear all costs of work required to repair or clean affected work as a result of failure to comply with this requirement.

3.5 CONCRETE JOINTS

- A. Structural Joints (Construction/Cold Joints):
- 1. Locate joints only where shown, or as approved.
 - 2. Review Required: Joints not indicated on the plans shall be located to meet the minimum requirements below, shall not impair the strength of the structure and shall be submitted to Architect/Engineer for review prior to placement of concrete.

- a. Indicate proposed location(s) of construction/cold/expansion joints on shop drawing submittals for review prior to placing concrete.
 3. Clean and roughen all surfaces of previously placed concrete at construction joints by washing and sandblasting to expose aggregate to 1/4 inch amplitude.
 4. Slabs-On-Grade: Maximum Length of continuous placement shall not exceed 60 feet without special review by the Architect/Engineer. Alternate or stagger placement sections.
 5. Foundations, Beams, Elevated Slabs and Joists: Maximum Length of continuous placement shall not exceed 200 foot increments. Provide "keyed" shut-off locations made up with form boards. Extend reinforcing one lap length or more through shut-off.
 - a. All reinforcement shall be continuous through construction/cold joint, lapping to adjacent reinforcing in future placement.
 - b. Construction Joints in Elevated Slabs: Review all proposed locations with Architect/Engineer.
 - c. Construction Joints in Slabs on Metal Decking: Review all proposed locations with Architect/Engineer. Do not locate closer than 24 inches to faces of girder or beam.
 6. Retaining and Basement Walls: Maximum Length of continuous placement shall not exceed 100 foot increments. Provide "keyed" shut-off locations made up with form boards to limit the length of continuous placement and at abrupt changes in wall thickness. Extend reinforcing one lap length or more through shut-off.
 - a. Review all proposed locations with Architect/Engineer
 - b. Horizontal construction joints are not allowed unless approved by the Engineer.
 7. Horizontal Construction Joints: Place 2 inch slurry (specified concrete mix less coarse aggregate) at beginning of pour at the bottom of walls unless a prior review of a mock-up section demonstrates that segregation of aggregate will not occur.
- B. Expansion/Construction Joints (Dowel Joints and Control Joints):
 1. Interior and Exterior Slabs-on-Grade:
 - a. Expansion/Construction Joints: Provide dowel joints or control joints at a maximum dimension (in feet) of three times the slab thickness (in inches) in each direction unless noted otherwise (15'-0" maximum). Install joints to match slab level and in straight lines. Locate joints at all reentrant corners including blockouts.
 - b. Proportions: Install joints to divide slab into rectangular areas with long dimensions less than 1.5 times short dimension.
 2. Exterior Concrete Slabs on Grade (walkways, patios):
 - a. Expansion/ construction joints: Provide a 2 inch deep troweled groove or asphalt impregnated joint material embedded 50 percent of the slab depth at 12 feet on center, maximum.
 - b. Proportions: Place no section with a length larger than two times width. Additionally, place joints at all inside corners and at all intersections with other work.
 3. Elevated Structural Slabs: Locate construction joints as specifically indicated on the drawings. All additional proposed locations shall be reviewed by the Architect/Engineer prior to placement.
 4. Retaining and Basement Walls:
 - a. Contraction Joints: Provide 3/4 inch wide beveled wood strips attached to inside face of formwork on each side of the wall. Wood strips shall extend 1/8 times the wall thickness into the wall. Cut 50% of the horizontal reinforcing bars at contraction joint locations.
 - b. Proportions: Place joints at 2 times the height of the wall on center max, but not less than 10'-0". Joints shall not exceed 25'-0" on center.
 - c. Review all proposed locations with Architect/Engineer

- C. Joint Types:
1. Dowel Joint: A keyed joint with smooth dowels passing through to allow unrestricted movement due to contraction and expansion. Joints are as specified on the drawings.
 2. Control Joint(s): Shrinkage crack control joints may be of the following types when shown on the drawings. Install joints in a straight line between end points with edges finished appropriate to type. Depth shall be 25% of the slab thickness, unless noted otherwise. Fill joints with sealant as shown on the drawings or as required by related sections.
 - a. 1/4 inch wide troweled joint.
 - b. Keyed joint: Only at locations where concealed by other finishes.
 - c. Masonite Strip, 1/8 inch: Only at locations where concealed by other finishes.
 - d. Saw Cut, 1/8 inch: Must be performed within eight hours of completion of finishing. Do not make saw cuts if aggregate separates from cement paste during cutting operation. Prevent marring of surface finish. Fill with flexible sealant.

3.6 VAPOR RETARDER

- A. Vapor Retarder Installation: Install as specified in PART 2, ASTM E1643, and per manufacturer's recommendations including taping and lapping of seams, sealing of penetrations, and repair of damage. Do not extend vapor retarder below footings.

3.7 FLATWORK

- A. General Requirements for All Concrete Formed & Finished Flat:
1. Edge Forms and Screeds: Set accurately to produce indicated design elevations and contours in the finished surface, edge forms sufficiently strong to support screed type proposed.
 2. Jointing: Located and detailed as indicated.
 3. Consolidation: Concrete in slabs shall be thoroughly consolidated.
- B. Flatwork Schedule:
1. Exterior Slabs-On-Grade: Place concrete directly over sub-base as indicated.
 - a. Sub-Base: Clean free draining, crushed base rock, 4 inch minimum thickness, thoroughly compacted.
 2. Interior Slabs-On-Grade:
 - a. Sub-Base: Clean free draining, crushed base rock, 4 inch minimum thickness, thoroughly compacted.
 - b. Vapor Retarder: Install over sub-base.

3.8 FORMED SURFACES

- A. Form all concrete members level and plumb, except as specifically indicated. Comply with tolerances specified in ACI 318 Section 26.11, ACI 301 Section 2, and this specification, except that maximum permissible deviation is 1/4 inch end-to-end for any single member.
- B. Cambers: Provide all cambers indicated in the formwork construction. Set screeds to produce specified cambers in the finished concrete.

3.9 CONCRETE FINISHES

- A. Flatwork Finishing:
1. All exposed concrete flatwork surfaces shall be non-slip. See Architectural, Civil, and Landscape drawings.
 2. Perform with experienced operators.
 3. Finish surfaces monolithically. Establish uniform slopes or level grades as indicated. Maintain full design thickness.
 4. In areas with floor drains, maintain design floor elevation at walls; slope surfaces uniformly to drains as indicated on drawings.
 5. Flatwork Finish Types:
 - a. Wood Float Finish: Surfaces to receive quarry tile, ceramic tile, or cementitious terrazzo with full bed setting system, or wood frame for raised finished floors.
 - b. Steel Trowel Finish: Surfaces to receive carpeting, resilient flooring, seamless flooring, thin set terrazzo, thin set tile or similar finishes specified in related sections. Trowel twice, minimum.
 - c. Broom Texture Finish: Exterior surfaces as indicated or for which no other finish is indicated. Finish as for steel trowel finish, except immediately following first troweling, (depending on conditions of concrete and nature of finish required) provide uniform surfaces texture using a medium or coarse fiber broom.
- B. Other Concrete: Provide as required to achieve appearance indicated on structural and architectural drawings and related sections.
1. Repair surface defects, including tie holes, immediately after removing formwork.
 2. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
 3. Exposed Form Finish: Finish concrete to match forms. Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
 - a. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
 - b. Grout Cleaned Finish: Wet areas to be cleaned and apply grout mixture by brush or spray; scrub immediately to remove excess grout. After drying, rub vigorously with clean burlap, and keep moist for 36 hours.
 - c. Cork Floated Finish: Immediately after form removal, apply grout with trowel or firm rubber float; compress grout with low-speed grinder, and apply final texture with cork float.
 4. Intermediate joint and score marks and edges: Tool smooth and flush unless otherwise indicated or as directed by the Architect.
 5. Use steel tools of standard patterns and as required to achieve details shown or specified. All exposed corners not specified to be chamfered shall have radiused edges.

3.10 TOLERANCES

- A. Minimum Flatwork Tolerances: Measure flatness of slabs within 48 hours after slab installation in accordance with ACI 302.1R and ASTM E1155 and to achieve the following FF and FL tolerances:
1. Exterior surfaces: 1/8 inch minimum per foot where sloped to drain. Level otherwise. FF20 and FL15.
 2. Interior surfaces not otherwise shown or required: Level throughout. FF25 and FL20
 3. Interior surfaces required to be sloped for drainage: 1/8 inch in 10 ft.
 4. Finish concrete to achieve the following tolerances:
 - a. Under Glazed Tile on Setting Bed: FF30 and FL20.

- b. Under Resilient Finishes: FF35 and FL25.
 - c. Flooring manufacturer and pertinent section of Division 9.
- B. Formed Surface Tolerances:
- 1. Permanently Exposed Joints and Surfaces: Provide maximum differential height within two feet of, and across construction joints of 1/16 inch.
 - 2. Vertical Elevations: Elevation of surfaces shall be as shown or approved.

3.11 SEPARATE FLOOR TOPPINGS

- A. Prior to placing floor topping, roughen substrate concrete surface and remove deleterious material. Broom and vacuum clean.
- B. Place required dividers, edge strips, reinforcing, and other items to be cast in.
- C. Apply bonding agent to substrate in accordance with manufacturer's instructions.
- D. Apply sand and cement slurry coat on base course, immediately prior to placing toppings.
- E. Place concrete floor toppings to required lines and levels. Place topping in checkerboard panels not to exceed 20 feet in either direction.
- F. Screed toppings level, maintaining surface tolerances per above.

3.12 CONCRETE CURING

- A. Curing - General: Cure in accordance with ACI 308. Maintain concrete water content for proper hydration and minimize temperature variations. Begin curing immediately following finishing.
- B. Protection During Curing: Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury. The General Contractor is responsible for the protection of the finished slab from damage.
 - 1. Avoid foot traffic on concrete for minimum of 24-hours after placement.
 - 2. Protect concrete from sun and rain.
 - 3. Maintain concrete temperature at or above 50 degrees F. during the first 7 days after placement. See Article ENVIRONMENTAL REQUIREMENTS.
 - 4. Do not subject concrete to design loads until concrete is completely cured, and until concrete has attained its full specified 28-day compressive strength or until 21 days after placement, whichever is longer.
 - 5. Protect concrete during and after curing from damage during subsequent building construction operations. See Article PROTECTION.
- C. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
 - 1. Normal concrete: Not less than 7 days.
 - 2. High early strength concrete: Not less than 4 days.
- D. Begin curing immediately following finishing.
- E. Surfaces Not in Contact with Forms:
 - 1. Start initial curing as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than 3 days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
 - 2. Begin final curing after initial curing but before surface is dry.
 - a. Moisture-retaining cover: Seal in place with waterproof tape or adhesive.

- b. Curing compound: Apply in two coats at right angles, using application rate recommended by manufacturer.
- 3. In addition, see specific conditions noted below.
- F. Slabs on Grade: Cure by one of the following methods:
 - 1. Water Cure (Ponding): Maintain 100 percent coverage of water over floor slab areas, continuously for minimum 7 calendar days.
 - 2. Spraying: Spray water over floor slab areas and maintain wet for 7 days.
 - 3. Moisture-Retaining Film or Paper: Lap strips not less than 6 inches and seal with waterproof tape or adhesive; extend beyond slab or paving perimeters minimum 6 inches and secure at edges; maintain in place for minimum 7 days.
 - 4. Absorptive Moisture-Retaining Covering: Saturate burlap-polyethylene and place burlap-side down over floor slab areas, lapping ends and sides and extend beyond slab or paving perimeters 6 inches minimum; maintain in place for minimum 7 days.
 - 5. Liquid Membrane-forming Curing Compound: Provide only when subsequent concrete treatments or finish flooring specified in related sections will not be affected by cure/sealer. Apply curing compound in accordance with manufacturer's instructions at the maximum recommended application rate in two coats, with second coat applied at right angles to first.
- G. Elevated Slabs: Cure by one of the following methods.
 - 1. Moisture-Retaining Sheet: As specified for Slabs on Grade above.
 - 2. Water Cure: As specified above for minimum 14 days.
 - 3. Apply Membrane Curing Compound as specified above after initial curing period.
- H. Concrete on Metal Decking: Moisture-Retaining Sheet method as specified above.
- I. Formed Concrete Members: Cure by moist curing with forms in place for full curing period.
 - 1. Protect free-standing elements from temperature extremes.
 - 2. Maintain forms tight for minimum 7 days. Maintain exposed surfaces continuously damp and completely covered by sheet materials thereafter.
 - 3. Maintain all shoring in place. Refer to related sections specifying formwork.
 - 4. Membrane Curing Compound: Apply compound in accordance with manufacturer's instructions in one coat.
- J. Foundations: Apply curing compound immediately after floating.

3.13 CONCRETE HARDENER

- A. Apply hardener to all floor slabs not receiving other finishes after 30 days minimum curing. Clean slabs of non-compatible cure/sealers or other foreign material(s) and apply in strict accordance with the manufacturer's directions.

3.14 GROUTING AND DRY PACK

- A. Set steel plates on concrete or masonry with high strength grout bed, completely fill all voids; thoroughly compact in place. See Section 05 1200 or 05 1100.
- B. Bolts or inserts dry packed or grouted in place shall cure for minimum 7 days before tensioning.

3.15 FIELD QUALITY CONTROL

- A. Testing and Inspections by Independent Testing Agency: Provided verification and inspection of concrete per CBC Table 1705A.3. Provide written reports for to Engineer, Architect, Contractor and Building Official for the following tests and inspections:
- B. Testing & Inspection: Provide periodic inspection of reinforcing steel. Provide continuous inspection during placement of structural class concrete, 3000 psi or more. Non-structural class concrete with a design strength of 2500 psi or less to have periodic inspection on a 150 cubic yard basis as required to assure conformance.
1. Provide periodic inspection of bolts in concrete prior to and during placement where so noted on the construction documents.
 2. Structural Concrete Cylinder Tests: Perform in accordance with ASTM C31.
 - a. Take four standard 6 inch x 12 inch (or five 4 inch x 8 inch) cylinder specimens on the site, of each class of concrete as specified in PART 2, not less than once a day or for each 50 cubic yards or 2000 sq ft or fraction thereof placed each day.
 - b. Record the location of each concrete batch in the building in a log and also note on each specimen.
 - c. Perform standard compression test of cylinders in accordance with ASTM C39, one at 7 days and two (three for 4x8 cylinders) at 28 days.
 - d. Hold fourth (fifth) cylinder untested until specified concrete strengths are attained.
 3. Structural Concrete Slump Test and Air Tests: Perform in accordance with ASTM D143 and C231 or C173 at the time of taking test cylinders, and/or at one-hour intervals during concrete placing.
 4. Measure and record concrete temperature upon arrival of transit mixers and when taking specimens. Note weather conditions and temperature.
 5. Propose adjustments to reviewed mix designs for Architect / Engineer review to account for variations in site or weather conditions, or other factors as appropriate.
 6. Water Vapor Transmission Tests: Floors receiving floor finishes specified in related sections will be tested prior to installation of flooring systems. Refer to sections specifying floor finishes for related requirements.
- C. Services by Contractor:
1. Rejection of Concrete Materials: Do not use the following without prior written approval of the Architect/Engineer;
 - a. Materials without batch plant certificates.
 - b. Materials not conforming to the requirements of these specifications.

3.16 ADJUSTING

- A. Inspect all concrete surfaces immediately upon formwork removal. Notify Architect/Engineer of identified minor defects. Repair all minor defects as directed.
- B. Surface and Finish Defects: Repair as directed by the Architect/Engineer, at no added expense to the Owner. Repairs include all necessary materials; reinforcement grouts, dry pack, admixtures, epoxy and aggregates to perform required repair.
1. Repair minor defective surface defects by use of drypack and surface grinding. Specific written approval of Architect/Engineer is required. Submit proposed patching mixture and methods for approval prior to commencing work.
 2. Slabs-on-Grade, Elevated Slabs and on Slabs on Metal Deck: Review for "curled" slab edges and shrinkage cracks prior to installation of other floor finishes. Grind curled edges flush, fill cracks of 1/16 inch and greater with cementitious grout.
 3. Grind high spots, fins or protrusions caused by formwork; Fill-in pour joints, voids, rock pockets, tie holes and other void not impairing structural strength. Provide surfaces flush with surrounding concrete.

3.17 DEFECTIVE CONCRETE

- A. Defective Concrete: Concrete not conforming to required compressive strength, lines, details, dimensions, tolerances, finishes or specified requirements; as determined by the Architect/Engineer.
- B. Repair or replacement of defective concrete will be determined by the Architect/Engineer who may order additional testing and inspection at his option. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
- C. Specific Defects:
 - 1. "Low-Strength"; Concrete Not Meeting Specified Compressive Strength after 28 days:
 - a. Concrete with less than 25% Fly Ash or 35% Slag as cementitious material: Test remaining cylinder(s) at 56 days. If strength requirements are met, concrete strength is acceptable.
 - b. Concrete with 25% or more Fly Ash or 35% or more Slag as cementitious material: Test remaining cylinder(s) at 70 days. If strength requirements are met, concrete strength is acceptable.
 - 2. Excessive Shrinkage, Cracking, Crazeing or Curling; Defective Finish: Remove and replace if repair to acceptable condition is not feasible.
 - 3. Lines, Details, Dimensions, Tolerances: Remove and replace if repair to acceptable condition is not feasible.
 - 4. Slab sections not meeting specified tolerances for trueness/flatness or lines/levels: Remove and replace unless otherwise directed by the Architect/Engineer. Minimum area for removal: Fifteen square feet area unless directed otherwise by the Architect/Engineer.
 - 5. Defective work affecting the strength of the structure or the appearance: Complete removal and replacement of defective concrete, as directed by the Architect/Engineer.

3.18 CLEANING

- A. Maintain site free of debris and rubbish. Remove all materials and apparatus from the premises and streets at completion of work. Remove all drippings; leave the entire work clean and free of debris.
- B. Slabs to Receive Floor Finishes Specified in other sections: Remove non-compatible cure/sealers or other foreign material(s) which may affect bonding of subsequent finishes. Leave in condition to receive work of related sections.

3.19 PROTECTION

- A. Protect completed work from damage until project is complete and accepted by Owner.
- B. Construction Loads: Submit engineering analysis for equipment loads (including all carried loads) specified in article submittals.
- C. Keep finished areas free from all equipment traffic for a minimum of 4 additional days following attainment of design strength and completion of curing.
- D. Protection of Drainage Systems:
 - 1. Care shall be taken not to introduce any foreign material into any specified drainage, piping or duct system.
 - 2. Cost of work to repair or clean drainage system as a result of failure to comply with this requirement will be back charged to the contractor.

- E. Cover traffic areas with plywood sheets or other protective devices; maintain protection in place and in good repair for as long as necessary to protect against damage by subsequent construction operations.

END OF SECTION

HGA
PROJECT #4952-002

06/05/2024
DSA SPC_V2

BUILDING 3000
MAINTENANCE OPERATIONS
WAREHOUSE & GARAGE
DSA 01-121159

BLANK PAGE

SECTION 03 35 43

POLISHED CONCRETE FINISHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Concrete polishing.

B. Related Requirements:

- 1. Section 03 30 00 "Cast-in-Place Concrete" for concrete for polished concrete, including concrete materials, mixture design, placement procedures, initial finishing, and curing.
- 2. Section 07 92 00 "Joint Sealants."

1.3 DEFINITIONS

- A. Design Reference Sample: Sample designated by Architect in the Contract Documents that reflects acceptable surface quality and appearance of polished concrete.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

- 1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with polished concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Ready-mix concrete manufacturer.
 - d. Cast-in-place concrete subcontractor.
 - e. Polished concrete finishing Subcontractor.
- 2. Review curing procedures, construction joints, concrete repair procedures, concrete finishing, and protection of polished concrete.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Polishing Schedule: Submit plan showing polished concrete surfaces and schedule of polishing operations for each area of polished concrete before start of polishing operations. Include locations of all joints, including construction joints.
- C. Samples for Verification: Submit five different samples, for review, by Architect. Samples shall show a range of color, aggregate size, and polished finish.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Repair materials.
 - 2. Liquid floor treatments.

1.7 QUALITY ASSURANCE

- A. Concrete Finishing Oversight:
 - 1. Manufacturer and installer to provide on-site supervision during placement and finishing.
 - 2. Acceptance of mix design, admixtures, and products.
 - 3. Maintain a floor flatness average of FF50 at 72 when tested to ASTM E1155.
 - 4. Saw cutting decorative pattern 24 hours after placement.
- B. Installer Qualifications:
 - 1. Firm specializing in work of this Section, with minimum 10 years' experience.
 - 2. Completion of 10 projects of similar size and complexity. Provide examples of work.
 - 3. Manufacturer-employed personnel. Provide resumes of personnel outlining experience with polished concrete.
- C. Field Sample Panels: After approval of verification sample and before casting concrete, produce field sample panels to demonstrate the approved range of selections made under Sample submittals. Produce a minimum of three sets of full-scale panels, approximately 48 by 48 inches minimum, to demonstrate the expected range of finish, color, and appearance variations.
 - 1. Locate panels as indicated or, if not indicated, as directed by Architect.
 - 2. Maintain field sample panels during construction in an undisturbed condition as a standard for judging the completed Work.
 - 3. Demolish and remove field sample panels when directed.

1.8 FIELD CONDITIONS

- A. Traffic Control: Maintain access for pedestrian traffic as required for other construction activities.
- B. Protect structural slab during construction to minimize chips, holes, anchors, and stains.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Performance Requirements

1. Slip Resistance, Wet Dynamic Coefficient of Friction (DCoF): Wet DCoF of installed flooring and paving shall be as follows, when measured in accordance with NFSI/ANSI B101.3.
 - a. Level Surfaces: Not less than 0.42.

2.2 LIQUID FLOOR TREATMENTS

A. Penetrating Liquid Floor Treatments for Polished Concrete Finish: Clear, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; that penetrates, hardens, and is suitable for polished concrete surfaces.

1. Hardening / Sealing Agent:
 - a. Advanced Floor Products, Inc. "Retro-Plate 99", or equal.

2.3 MANUFACTURER

A. Floor Seal Technology, Inc. "MirrorCrete" or equal.

1. Desired Level 1: Matte finish.
2. Aggregate exposure to be determined through samples and mock-ups.

2.4 MATERIALS

A. Densifier: Odorless, non-film forming penetrating colloidal silica solution, reactive with free lime and calcium hydroxide; designed to chemically harden and densify concrete surface.

1. Product: MirrorCrete.

B. Sealer: Film forming, stain resistant, water repellent, impregnating type.

1. Product: MirrorSeal.
2. Description: Translucent, water based.
3. Product: MirrorCrete Dye.
4. Color: To be selected from manufacturer's full color range.

C. Surface Repair Products: Manufacturers color matching repair system for a seamless visual surface.

1. Product: ColorMatchpatch.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Test floors in accordance with manufacturer's instructions.
- B. Contractor to polish structural slab before installing partitions
- C. Contractor to protect structural slab during construction with
 - 1. 1-layer poly (taped).
 - 2. 1-layer 1" rigid insulation.
 - 3. 1-layer ½" plywood.
- D. Contractor to avoid installing temporary structure or other construction activities on protected area.

3.2 POLISHING

- A. Polish: Match design reference sample.
- B. Apply polished concrete finish system to cured and prepared slabs to match accepted mockup.
 - 1. Machine grind floor surfaces to receive polished finishes level and smooth.
 - 2. Apply penetrating liquid floor treatment for polished concrete in polishing sequence and according to manufacturer's written instructions, allowing recommended drying time between successive coats.
 - 3. Continue polishing with progressively finer-grit diamond polishing pads to gloss level, to match approved mockup.
 - 4. Control and dispose of waste products produced by grinding and polishing operations.
 - 5. Neutralize and clean polished floor surfaces.
- C. Scoring: Score decorative jointing in concrete surfaces 1/16-inch deep with diamond blades to match pattern indicated. Rinse until water is clear.
 - 1. Joint Width: 3/8 inch.

3.3 PROTECTION

- A. Protect finished work until fully cured in accordance with manufacturer's recommendations.
- B. Use Ramboard, or equal floor covering/protection immediately following polishing and maintain through substantial project completion.

3.4 POLISHING

- A. Fill surface imperfections using surface repair products such that imperfections are not noticeable when viewed from 5 feet away under lighting conditions that will be present after construction.
- B. Apply one coat of undiluted densifier solution to point of rejection, remove excess liquid, and allow to cure according to manufacturer's instructions.

- C. Re-apply one additional coat of undiluted densifier solution to point of rejection, remove excess liquid, and allow to cure according to manufacturer's instructions.
- D. Polish floors up to 400 resin.
- E. Apply 2 coats of sealer.
 - 1. Finish: Level 2 polish, low sheen.
- F. Final Surface: Abrasion and scratch free, uniform in appearance.

3.5 SEALING

- A. Apply up to 2 coats of sealer to manufacturer's recommend coverage in gloss level selected by Architect.
- B. Burnish to uniform sheen matching approved mockup.

3.6 SAW CUTTING

- A. Apply saw cut patterns within 24 hours of concrete placement.
- B. See drawings for pattern.

3.7 FIELD QUALITY CONTROL

- A. Measure slip resistance using BOT-3000 slip-tester; ensure compliance with specified slip resistance rating.
- B. Protect surfaces from contamination and damage.

END OF SECTION

SECTION 04 20 00

CONCRETE UNIT MASONRY

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes: All labor, material and equipment and perform all operations required to complete all masonry work as indicated on the drawings and specified.
- B. Additional work included in this section: Provision of concrete grout and installation of items provided by other trades that are embedded in and/or attached to masonry work; providing forms at block-outs and formed concrete grout.
- C. Related Sections:
 - 1. Pertinent Sections of Division 01 specifying Quality Control and Testing Agency services.
 - 2. Pertinent sections of other Divisions specifying formwork, reinforcement, concrete, masonry, steel, and rough carpentry.
 - 3. Pertinent Sections of other Divisions specifying work to be embedded in concrete or work penetrating concrete work.

1.2 REFERENCES AND STANDARDS

- A. California Code of Regulations, Title 24, latest adopted edition (herein noted as CBC): Chapter 19A Concrete, Chapter 21A Masonry
- B. TMS 402 / ACI 530 / ASCE 5 “Building Code Requirements for Masonry Structures”.
- C. TMS 602 / ACI 530.1 / ASCE 6 “Specification for Masonry Structures”.
- D. ASTM A615 “Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement”.
- E. ASTM C90 “Load-Bearing Concrete Masonry Units”.
- F. ASTM C144 “Aggregate for Masonry Mortar”.
- G. ASTM C270 “Mortar for Unit Masonry”.
- H. ASTM C404 “Aggregates for Masonry Grout”.
- I. ASTM C476 “Grout for Masonry”.

1.3 SUBMITTALS

- A. Submit in accordance with Division 01 specifying submittal procedures. The General Contractor shall review and approve submittals prior to submittal to the Architect/Engineer. Submittals that do not meet these requirements will be returned for correction without review.

- B. Limitation of Review: Structural Engineer's review will be for general conformance with design intent as indicated in the Contract Documents and does not relieve Contractor of full responsibility for conformance with the Contract Documents.
- C. Product Data: Submit manufacturer's product data, specifications, location and installation instructions for proprietary materials and reinforcement accessories. Provide samples of these items upon request.
- D. Contractor Submittals:
 - 1. Mix design for all grout and mortar, prepared by a qualified testing laboratory, per TMS 602 section 1.5. Show conformance of mix to proportion specification of ASTM C270 for mortar and ASTM C476 for grout. Alternatively, provide test results and show conformance of mix to property specification of ASTM C270 for mortar and ASTM C476 for grout. Mix shall conform to all requirements herein.
 - 2. Material certificates for all materials used in mixes.
 - 3. Submit shop drawings for all shapes and sizes of concrete unit masonry shown and scheduled on the drawings. Submit shop drawings detailing and locating all masonry reinforcement.
 - 4. Certificate of compliance and test data by concrete unit masonry supplier showing conformance to specified material strengths and properties.
 - 5. Samples: Laid up sections of masonry walls for the Architect's approval of size, texture and color of block, mortar and joint pattern.
 - 6. Layout of vertical control joints in masonry walls coordinated with structural and architectural drawings.
 - 7. Submit cold and/or hot weather construction procedures when ambient temperature is below 40°F or above 90°F. See PART 3.

1.4 QUALITY ASSURANCE

- A. For requirements of the Authority Having Jurisdiction, refer to pertinent sections of Division 01 and CBC Chapter 17A.
- B. All tests shall be performed by an approved Testing Agency as specified in pertinent sections of Division 01.
- C. Testing and Inspection: Tests and inspections performed by approved Testing Agency are specified below in Articles SOURCE QUALITY CONTROL and FIELD QUALITY CONTROL and the Testing & Inspection Form. Duties and limitations of approved Testing Agency, test costs and test reports in conformance with pertinent sections of Division 01.
- D. General: Provide reports to Architect/Engineer and Authorities Having Jurisdiction (AHJ) indicating results of tests and inspections.
- E. Concrete Unit Masonry
 - 1. All testing of concrete unit masonry by the approved Testing Agency shall comply with the requirements of CBC Chapters 17A and 21A.
 - 2. Approved Testing Agency shall provide Level 3 Quality Assurance Program per TMS 602 and CBC Chapter 17A by an approved inspector of masonry construction.
- F. Contractor shall provide adequate materials for sampling and shall patch core holes made by the approved Testing Agency using non-shrink, high-strength grout.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver and store packaged material in original containers with seals unbroken and labels intact until time of use.
- B. Unload masonry units carefully and store on raised platform protected from weather.
- C. Protect cementitious materials against exposure to moisture. Use of cementitious or other materials that have become caked and hardened from absorption of moisture will not be permitted.

1.6 JOB CONDITIONS

- A. Environmental Conditions: Do not place concrete unit masonry when temperature is below 40 degrees Fahrenheit or above 90 degrees Fahrenheit unless the Contractor provides means for preventing damage due to freezing or high-temperatures before and after placement and the Architect/Engineer approves. See Section PART 3.
- B. Protection: Protect surrounding work as required against damage from masonry work. Clean satisfactorily or otherwise correct damage to surrounding work resulting from masonry work. See PART 3.

1.7 SCHEDULING AND SEQUENCING

- A. Organize the work and employ shop and field crew(s) of sufficient size to minimize inspections by the approved Testing Agency.
- B. Provide schedule and sequence information to approved Testing Agency in writing upon request. Update information as work progresses.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Hollow Load-Bearing Concrete Masonry Units:
 - 1. General: All concrete masonry units shall be double open end wherever possible (single open end otherwise).
 - 2. Concrete masonry units shall be medium or light weight and shall conform to ASTM C90. Minimum compressive strength shall be 2000psi.
 - 3. Concrete masonry units exposed to view shall be 8x8x16 unless otherwise noted on the construction drawings. Concrete masonry caps shall be 2x8x16 (nominal) standard grey unless otherwise noted on the construction drawings.
- B. Portland Cement: ASTM C150, Type II, low alkali
- C. Aggregates
 - 1. For Mortar: ASTM C144.
 - 2. For Grout: ASTM C404.
- D. Hydrated Lime: ASTM C207, Type S

- E. Quick Lime: ASTM C5, high calcium
- F. Reinforcing Steel: ASTM A615 (or A706) grade 60.
- G. Water: Clean and potable, free from impurities detrimental to mortar and grout.
- H. Grout Aid: "Grout Aid" by Sika Corporation.
- I. High Strength Grout: Conform to CRD-C621 and ASTM C1107. Non-shrink, non-ferrous, minimum compressive strength at 28 days to be 7000 psi (when placed in a fluid state). Meet or exceed BASF "Master Flow 928".
- J. Pre-molded Control Joint: ASTM D2000 M2AA-805 rubber shear keys with a minimum durometer hardness of 80 or ASTM D2287 Type PVC 654-4 PVC shear keys with a minimum durometer hardness of 85.
- K. Flexible Sealant: ASTM C920.
- L. Mortar Color: Submit to Architect for approval.

2.2 FABRICATION

- A. Reinforcement: Conform to requirements of Section 03 2000, Concrete Reinforcing.

2.3 MIXES AND MIXING

- A. General Mixing Requirements:
 - 1. Measure materials accurately. Shovel measurements will not be permitted.
 - 2. Use mechanical mixer of at least one sack capacity.
 - 3. Mix for minimum of three minutes and in no case less than time required for securing uniform mass and workable consistency.
 - 4. Completely empty drum before charging succeeding batch of materials.
 - 5. Exercise extreme care in measuring ingredients for partial batches.
 - 6. Air entraining admixtures are not permitted.
- B. Mortar
 - 1. Type M or S per ASTM C270. Minimum compressive strength at 28 days: 2000 psi (Type S), 2500 psi (Type M). Admixtures not allowed. Otherwise conform to CBC Section 2103A.2.1.
 - 2. Use and place mortar in final position within 2-1/2 hours after mixing. Mortars that have stiffened due to evaporation of water may be retempered with water as frequently as required to restore required consistency during this time period.
 - 3. Provide integrally colored mortar to match block. Colors to be submitted to Architect for approval. Add mortar colors in accordance with manufacturer's recommendations. Ensure uniformity of mix and coloration.
- C. Concrete Grout
 - 1. General:
 - a. Six sacks (94 pounds per sack) of cement per cubic yard minimum. Concrete masonry grout compressive strength to attain 2000 psi minimum after 28 days.

- b. One pound "Sika Grout Aid" per sack of cement (6 pounds maximum per cubic yard).
 - c. Slump: 8 to 11 inches.
 - d. "Coarse" type per TMS.
2. Otherwise conform to CBC Section 2103A.3.

2.4 SOURCE QUALITY CONTROL

- A. An approved Testing Agency will perform source quality control tests and submit reports, as specified in pertinent section of Division 01 and CBC Chapter 17A and 21A.
- B. Test materials per CBC Chapter 17A, 21A, and TMS 602 Section 1.4B unit strength method or prism test method.
 1. Unit strength testing, testing shall be per TMS 602 Section 1.4B and CBC Sections 2105A.3. Mortar shall be samples on (3) successive work days and at (1) per week thereafter. Grout shall be sampled (1) per every 5,000 square feet of wall area and not less than (1) per work day.
 2. Prism testing, a minimum of (3) prisms shall be tested per every 5,000 square feet of wall.

PART 3 – EXECUTION

3.1 INSPECTION BY CONTRACTOR

- A. Examine areas to receive masonry and verify following per TMS 602:
 1. Foundation surface is level to permit bed joint within range of 1/4 to 3/4-inch.
 2. Edge is true to line to permit projection of masonry to less than 1/4-inch.
 3. Projecting dowels are free from loose scale, dirt, concrete or other bond-inhibiting substances and properly located.
 4. Built-in items are properly sized and located.
- B. Do not begin work before unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean concrete surfaces to receive masonry. Remove laitance or other foreign material lodged in surface by sandblasting or other means as required. Roughen foundation bed to expose aggregate; remove loose particles and saturate before laying units.
- B. Ensure masonry units are clean and free from dust, dirt or other foreign materials before laying.

3.3 REINFORCEMENT

- A. Place bars where noted in accordance with drawings and SP-66 "ACI Detailing Manual". Do not disturb after start of masonry placement.

- B. Splice bars with dowels cast in concrete; lap bars per drawings. Bars shall not be "stabbed" after grout placement. All reinforcing shall be tied in place with wire prior to grout placement. The use of approved bar spacers is acceptable.

3.4 PLACEMENT

A. General Requirements

1. Masonry construction shall conform with TMS 602 as modified by CBC Chapter 21A.
2. Ensure masonry units are sound, clean and free of cracking at time of placement.
3. Accurately cut and fit units as required using masonry saws to accommodate work of other sections.
4. Lay masonry units plumb, true to line with level courses accurately placed. Maximum tolerance 1/4" in 8'-0".
5. Adjust unit to final position while mortar is soft and plastic.
6. Align vertical cells accurately.
7. Remove units disturbed after stiffening of mortar, clean joints and relay unit with fresh mortar.
8. Do not attach construction supports to walls.
9. Install anchor bolts and other embedded items accurately as work progresses. Use templates as necessary to meet required tolerance of other's work.
10. Brace walls adequately until supporting structure is complete.
11. Do not place conduit, pipes, wire, etc. in cells containing reinforcing steel.

B. Joints:

1. Fill joints; ensure full coverage of face shells in both horizontal and vertical joints and on webs.
2. Tool (concave) and finish joints as specified to achieve solid, smooth, watertight compacted joint.
3. Immediately fill holes made by line pin with mortar when pin is withdrawn.
4. Remove surplus mortar from joints.
5. Provide vertical control joints at 1.5 times the wall height (but not greater than 25'-0") and as detailed on the structural drawings.

C. Cold Weather Requirements

1. When ambient temperature is below 40 degrees Fahrenheit, submit cold weather protection plan per TMS 602 Section 1.8C. Ensure reinforcing, masonry units, etc. contacting mortar and grout are free of frost.

D. Hot Weather Requirements

1. When ambient temperature exceeds 90 degrees, submit hot weather protection plan per TMS 602 Section 1.8D.

E. Protection

1. Protect face materials against staining.
2. Remove misplaced grout or mortar immediately.
3. Protect sills, ledges, off-sets and similar items from mortar drippings or other damage during construction.
4. Cover top of unfinished work to protect it from weather and debris.

F. Concrete Masonry Units

1. Bond: Running bond unless specifically noted otherwise.
2. Joint Thickness: 3/8-inch both vertically and horizontally.
3. Joint Treatment:

- a. Typical exterior and interior walls; tool joint for weather tightness.
- b. Construction joints to be sealed with joint sealant or high strength grout as noted on the drawings.
4. Use proper units to provide for doors, bond beams lintels, etc. in order to minimize cutting.
5. Do not wet units.
6. Align vertical cells to provide continuous, unobstructed opening for grouting.
7. Corners: Provide standard masonry bond by overlapping units.
8. Provide mechanical cleanout methods as needed. To facilitate cleanout where pour height exceeds 48 inches, provide inverted bond beam units at the bottom of each pour and provide cleanouts in these courses as necessary, not exceeding 32 inches on center. Provide cleanout at each vertically-reinforced cell. Locate cleanouts to minimize visual impact. Verify with Architect/Engineer.

3.5 GROUTING

A. General Requirements

1. Conform to requirements of TMS 602 as modified by CBC Chapter 21A.
2. A pour is defined as the height of grout to be placed in one day. The height of masonry unit placement at the time of grouting shall not exceed the pour height. Masonry shall have cured minimum 4 hours before grout placement. Maximum pour height is 12 feet, or less, as determined by the contractor. Maximum individual lift height is 5 feet 4 inches, or less, as determined by the contractor. Allow time between lifts for initial water loss of grout to occur. Do not allow grout to cure between lifts. Contractor is responsible for adequate cleaning and prevention of blowouts.
3. Grout void between wythes and cells of concrete block.
4. Ensure grout flows into voids and completely surrounds reinforcing steel.
5. Stop grout approximately one and a half inches below top of last course except at top course without a concrete cap.
6. Grout from a non-exposed face of masonry wherever possible.
7. Where necessary to stop longitudinal run, provide suitable dam to retain grout in place.
8. Clean all cells of pour space prior to grouting. Remove all loose mortar, etc.
9. Consolidate grout with a mechanical vibrator with a 3/4" head.
10. Slushing with mortar will not be permitted.
11. Use grout pump, hopper or bucket to place grout.
12. Do not wet down grout spaces prior to grouting.
13. Otherwise conform to CBC Section 2104A.1.3.
14. Do not subject masonry to design loads until masonry is completely cured, and until masonry has attained its full specified 28-day compressive strength or until 21 days after placement, whichever is longer.

3.6 FIELD QUALITY CONTROL

- A. The approved Testing Agency will perform field quality control tests, as specified in pertinent sections of Division 01 and CBC Chapters 17A and 21A.
- B. The approved Testing Agency will provide inspections per the requirements of CBC Section 1705A.4.
- C. Concrete masonry shall have an assumed 28 day prism strength of 2000psi.
- D. Core test installed masonry per CBC Section 2105A.4.

3.7 POINTING AND CLEANING

- A. Point holes or defective mortar joints upon completion of work; where necessary, cut out and repoint defective joints.
- B. At end of workday, fiber brush new surfaces to remove mortar splashes, clean with mild detergent or enzymes, and rinse with clean water.
- C. When ordinary methods are not adequate, employ sandblasting, chipping or other special methods.
- D. Do not use acid solution to remove green stain or efflorescence resulting from vanadium salts. Follow recommendations of manufacturer for removal of such stains.
- E. Clean all surfaces upon completion of erection; leave free of grime and dirt. Remove unused materials, tools, equipment and debris from the premises and leave surfaces broomed clean.
- F. Protect work from damage by subsequent operations.

3.8 ADJUSTING

- A. Replace all defective work at Contractor's expense.
- B. Replace defective or damaged work with conforming work.
- C. Architect/Engineer shall review all proposals for the repair or replacement of damaged, defective, or missing work.
- D. Contractor to pay expenses incurred by Owner for Architect/Engineer's costs for (re-) design and obtaining approvals of Authorities Having Jurisdiction necessitated by incomplete, inefficiently scheduled, improperly performed, defective or nonconforming work, as specified in pertinent sections of Division 01.
- E. Pay expenses due to re-testing and re-inspection necessitated by incomplete, inefficiently scheduled, improperly performed, defective or nonconforming work, as specified in pertinent sections of Division 01.

END OF SECTION

SECTION 05 12 00
STRUCTURAL STEEL FRAMING

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes: All labor, materials, equipment and operations required to complete structural and miscellaneous metals in shapes and configurations indicated; including:
1. Structural steel columns, beams, bracing, base plates, bolts, joist hangers, and stud bolts welded to structural steel.
 2. Miscellaneous structural steel and connections; fabricated connectors and hangers installed by related sections.
 3. Anchor bolts and steel inserts embedded in concrete or masonry, installed by related sections.
 4. Fabricated steel items embedded in concrete or masonry installed by related sections.
 5. Supervision of anchor bolt setting, leveling and elevations to insure required fit of steel work.
 6. Shop priming and field touch-up, galvanizing.
 7. Bracing, Shoring, Fabrication and Erection.
- B. Related Sections:
1. Pertinent sections of Division 01 specifying Quality Control and Testing Agency services.
 2. Pertinent Sections of other Divisions specifying concrete reinforcement, formwork, concrete, structural and miscellaneous metal fabrications, steel joists, metal decking, cold-formed metal framing, rough carpentry.

1.2 REFERENCES

- A. California Code of Regulations, Title 24, latest adopted edition (herein noted as CBC): Chapter 22A Steel.
- B. American Institute of Steel Construction (AISC) 303 "Code of Standard Practice for Steel Buildings and Bridges".
- C. AISC 341 "Seismic Provisions for Structural Steel Buildings".
- D. AISC 358 "Prequalified Connection for Special and Intermediate Steel Moment Frames for Seismic Applications".
- E. AISC 360 "Specification for Structural Steel Buildings".
- F. American Welding Society (AWS) D1.1 "Structural Welding Code - Steel".
- G. AWS D1.8 "Structural Welding Code - Seismic Supplement".
- H. Research Council on Structural Connections (RCSC) "Specification for Structural Joints Using High-Strength Bolts".
- I. Underwriters Laboratories (UL) FRD "Fire Resistance Directory".

1.3 SUBMITTALS

- A. Submit in accordance with pertinent sections of Division 01 specifying submittal procedures. The General Contractor shall review and approve shop drawings prior to submittal to the Architect/Engineer. Submittals that do not meet these requirements will be returned for correction without review.
- B. Limitation of Review: Structural Engineer's review will be for general conformance with design intent as indicated in the Contract Documents and does not relieve Contractor of full responsibility for conformance with the Contract Documents.
- C. Product Data: Submit manufacturer's product data, specifications, location and installation instructions for proprietary materials and reinforcement accessories. Provide samples of these items upon request.
- D. Shop drawings: Submit each building as a complete unit. Do not mix components from multiple buildings or units of work in a submittal. Include all of the following;
 - 1. Profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.
 - 2. Fabrication tolerances for all steel.
 - 3. Connections: All, including type and location of shop and field connections.
 - 4. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths, type, size, and sequence. Designate demand critical welds.
 - 5. Designation of Seismic Force Resisting System (SFRS) members and connections. Locate and dimension protected zones. Braced frame gusset plates shall be drawn to scale.
 - 6. Cross-reference all shop drawing detail references to contract document detail references.
 - 7. Secure all field measurements as necessary to complete this work prior to submitting shop drawings for review.
 - 8. Provide holes, welded studs, etc. as necessary to secure work of other sections.
 - 9. Provide the following as separate submittals for each building or unit of work:
 - a. Bolt and anchor setting plans.
 - b. Layout, fabrication and erection drawings.
- E. Certifications:
 - 1. Steel Materials: Submit the following for identified materials.
 - a. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.
 - b. Mill Test Reports: Indicate structural strength, destructive test analysis, and non-destructive test analysis.
 - c. Contractor's affidavit certifying that all identified steel materials provided are of the grades specified and match the certificates supplied.
 - 2. High-Strength Bolting: Certify all materials provided are the grades specified.
 - 3. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification per AWS D1.1.
- F. Samples: Provide samples to the Testing Agency as specified in Article SOURCE QUALITY CONTROL, at no additional costs.

1.4 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies, refer to pertinent sections of Division 01 and CBC Chapter 17A.

- B. All tests shall be performed by a recognized testing agency as specified in pertinent sections of Division 01.
- C. Certification and Identification of Materials and Uses: Provide Testing Agency with access to fabrication plant to facilitate inspection of steel. Provide notification of commencement and duration of shop fabrication in sufficient time to allow inspection and all material identification/test information listed below.
 - 1. Test all steel as required by ASTM A6.
 - 2. Provide manufacturer's Mill Test Reports for all materials. Include chemical and physical properties of the material for each heat number manufactured. Tag all fabricated materials with heat number.
 - 3. Provide letter certifying all materials supplied are from heat numbers covered by supplied mill certificates. Include in letter the physical location of each material type and/or heat number in the project (i.e. walls, braced frames etc.).
 - 4. Unidentified Material Tests: Where identification of materials by heat number or mill tests cannot be made, Owner's Testing Agency shall test unidentified materials.
 - 5. Provide all certification, verifications, and other test data required to substantiate specified material properties at no additional cost to the Owner.
- D. Testing and Inspection: Tests and Inspections performed by Independent Testing Agency are specified below in Articles SOURCE QUALITY CONTROL and FIELD QUALITY CONTROL. Duties and limitations of Independent Testing Agency, test costs and test reports in conformance with pertinent sections of Division 01.
- E. The following standards are the minimum level of quality required. Provide higher quality work as specifically indicated in the Contract Documents.
 - 1. Workmanship and details of structural steel work shall conform to the CBC and AISC 360.
 - 2. The quality of materials and the fabrication of all welded connections shall conform to AWS D1.1 and D1.8.
 - 3. Comply with Section 10 of AISC 303 for architecturally exposed structural steel.
- F. The Testing Agency will review all submittals and testing of materials.
- G. All re-inspections made necessary by non-conforming work shall be at the Contractor's expense.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to project site in bundles marked with durable tags indicating heat number, mill, member size and length, proposed location in the structure and other information corresponding with markings shown on placement diagrams.
- B. Handle and store materials above ground to prevent damage, contamination or accumulation of dirt or rust.

1.6 SCHEDULING AND SEQUENCING

- A. Organize the work and employ shop and field crew(s) of sufficient size to minimize inspections by the Testing Agency.
- B. Provide schedule and sequence information to Testing Agency in writing upon request. Update information as work progresses.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Structural Steel W Shapes: ASTM A992 Gr. 50 or ASTM A572 Gr. 50.
- B. Structural Steel Plates: ASTM A36 or ASTM A572 Gr. 50 or ASTM A529 Gr. 50
- C. Structural Steel Channels, Angles: ASTM A36 or ASTM A572 Gr. 50.
- D. HSS (Hollow Structural Sections):
 - 1. Round: ASTM A500, Gr. B.
 - 2. Rectangular or Square: ASTM A500, Gr. C.
- E. Pipe: ASTM A53, Grade B.
- F. Bolts and Washers: See FINISHES section for galvanization, where required.
 - 1. Machine Bolts, Nuts, and Washers: Bearing and shear connections (denoted as "MB"); ASTM A307 Grade A machine bolts with ASTM A563 Grade A nuts and ASTM F844 washers to match.
 - 2. High Strength Bolts, Nuts, and Washers: Bearing and shear connections (denoted as "HSB"); ASTM F3125 Grade A325 or A490 with ASTM A563 Grade C nuts (Grade DH at A490) and ASTM F436 Type 1 washers.
 - a. HSB-N: For use in snug tight (ST), pretensioned (PT), and slip critical (SC) joints. Conform to the RCSC Specifications.
 - b. HSB-X: For use where specified on the drawings.
 - c. Use of ASTM F3125 Grade F1852 (twist off assemblies) is permitted conforming to requirements of RCSC Specifications.
 - d. Use of ASTM F959 Load Indicator Washers is permitted conforming to the requirements of RCSC Specifications.
 - e. Slip critical (SC) bolt faying surfaces shall be prepared per RCSC as Class A, unless noted to be Class B per the drawings. Galvanized surfaces at SC bolts shall be hand wire brushed.
- G. Headed Stud Type Shear Connectors: ASTM A108 and AWS D1.1 Section 7.
- H. Deformed Bar Anchors: ASTM A496.
- I. Anchor Bolts/Rods:
 - 1. ASTM F1554 Grade 36 or 55 with ASTM A563 Grade A nuts and ASTM F436 Type 1 washers.
 - 2. ASTM F1554 Grade 105 where indicated on plans with ASTM A563 Grade DH nuts and ASTM F436 Type 1 washers.
 - 3. No upset thread allowed.
- J. Arc-Welding Electrodes: AWS Standards E70 or equivalent, except no E70T-4 allowed. Additionally, welding electrodes to be used in the welding of seismic force resisting system to conform to AISC 341 and AWS D1.8.
- K. Other Welding Materials: AWS D1.1; type required for materials being welded.

2.2 ACCESSORIES

- A. High Strength Grout: ASTM C1107, non-shrink, premixed compound consisting of aggregate, cement, and water reducing plasticizing agents.
 - 1. Minimum Compressive Strength at 3 days: 3000 psi.
 - 2. Minimum Compressive Strength at 28 days: 7000 psi, placed in a "fluid" state.
 - 3. Provide only non-metallic grout at exposed work.
 - 4. Meet or exceed properties of BASF "Master Flow 928" mixed to fluid consistency. Other acceptable manufacturers: The Burke Company and W.R. Meadows, Inc.

- B. Building Structural Steel Primers: Comply with local VOC limitations of authorities having jurisdiction and the California Green Building Code. Verify compatibility with finish coats specified in other sections. Follow manufacturers printed instructions. Apply one coat unless otherwise directed.
 - 1. Type A: Self-Crosslinking Hydrophobic Acrylic passing 2000 hours ASTM D4585 and 7000 hours ASTM D5894. "Series 115 Uni-Bond DF" by Tnemec (2.0 to 4.0 mils DFT).
 - 2. Type B: Organic Zinc-Rich Urethane passing 50,000 hours ASTM B117 and 15000 hours ASTM G85. "Series 90-97 Tneme-Zinc" by Tnemec (2.5 to 3.5 mils DFT) or "Series 94-H2O Hydro-Zinc" by Tnemec (2.5 to 3.5 mils DFT).
 - 3. Type C: MIO-Zinc Filled Urethane passing 10,000 hours ASTM B117 and 5000 hours ASTM D4585. "Series 394 PerimePrime" by Tnemec (2.5 to 3.5 mils DFT).

- C. Galvanizing: ASTM A153 and A123.

- D. Touch-Up Primer for Galvanized Surfaces: Type B primer.

2.3 FABRICATION

- A. Shop fabricate to greatest extent possible.

- B. Continuously seal built up members by continuous welds where exposed to weather.

- C. Fabricate connections for bolt, nut, and washer connectors.

- D. Protect all materials, before and after fabrication, from rust, corrosion, dirt, grease, and other foreign matter.

- E. Fabricate framing members free from twists or bends. Form holes, cut and sheared edges neatly without kinks, burrs, or warped edges.

- F. Exposed Steel: Straight, smooth, free of nicks, scars or dents.

- G. Gas Cutting: Gas cutting of holes in a member shall not be permitted.

- H. Splicing of members: Members requiring splicing due to length requirements may be spliced using full penetration butt welds when such welds and procedures are inspected and certified by the Testing Agency, in conformance with AWS and AISC standards. The location of splices shall be approved by the Architect/Engineer in writing prior to fabrication.

- I. Welding: Welding of structural steel connections shall be performed by qualified welders in accordance with AWS Standards. All weld sizes shall match those shown on the drawings.
 - 1. Preparation: Clean all surfaces free of rust, paint and all foreign matter. Remove paint or scale by brushing, chipping or hammering as required. Chip clean and wire brush burned or flame cut edges before welding. Space and alternate

- welds, clamping as necessary to prevent warp or misalignment.
2. Sequence Welding: When welds enclose, or partially enclose, the perimeter or portion of the surface of a member, make weld bead in sequence, or staggered. Minimize internal stresses. Weld groups of members occurring in a single line in staggered sequence to minimize distortion of the structural frame.
 3. Faulty and Defective Welding: Welds failing to meet AWS standards and the Contract Documents shall be rejected and remade at Contractor expense. All welds showing cracks, slag inclusion, lack of fusion, bad undercut or other defects, ascertained by visual or other means of inspection shall be removed and replaced with conforming work.
 4. Minimum Weld Strengths: All welds shall match the minimum weld sizes recommended by AISC. Details of fabrication not specifically shown shall match similar details which are specifically shown. All bevel and groove welds shall be full penetration unless size is noted otherwise.
 5. Threaded studs, headed studs, and deformed bar anchors shall be full-fusion welded conforming to ASW D1.1.
- J. Camber: Fabricate all beams cambered as indicated on the drawings.
1. Fabricate beams without camber for installation with any "natural" crown up.
 2. Exception: Fabricate cantilever beams with "crown" down.
- K. Grinding: Grind smooth the following structural steel and connections;
1. Exposed cut ends of structural and fabricated shapes.
 2. All welds exposed to view.
 3. Mitered and fit-up corners and intersections.
- L. Back-Up Bars: Required for all complete penetration welds. See requirements of AISC 358.
- M. Bolt Holes: Edge, end distances and spacing shall conform to dimensions shown on the drawings, and as follows;
1. Round: Size indicated and 1/16 inch maximum oversize, except 1 inch and larger bolts may have 1/8 inch maximum oversize.
 2. Slotted: At locations specifically noted on the drawings, provide size indicated and 1/16 inch by 1/4 inch oversize slotted in direction perpendicular to applied loads.
 3. Holes in base plates for anchor bolts may be 1/8 inch oversize.

2.4 FINISHES

- A. Steel exposed to inclement atmospheric conditions or weather (such as coastal moisture or seasonal rain) shall be sufficiently primed or otherwise protected against corrosion. If condition of steel is suspect due to weathering/corrosion, Contractor shall bear cost of inspection to determine if excessive corrosion is present and if steel member(s) requires repair or replacement. Contractor shall bear cost of repair or replacement.
- B. Prepare and finish structural and miscellaneous steel component surfaces as follows, unless a higher standard-of-care is determined necessary per item A:
1. Unpainted, interior, dry exposure surfaces need not be primed.
 2. Finished painted, interior, dry exposure surfaces:
 - a. Surface Preparation: SSPC-SP2 Hand-Tool and/or SP3 Power-Tool Cleaning. Apply Primer Type A. Field touchup with same primer.
 - b. Where jobsite exposure is expected to exceed 6 months, SSPC-SP6 / NACE No. 3 Commercial Blast-Cleaning is required. Apply Primer Type B or C. Field touchup with same primer.
 3. Finish painted surfaces with exterior exposure, interior exposure subject to wet

conditions or fumes, or surfaces to receive high performance finish coatings (for example epoxy or urethane coatings).

- a. Surface Preparation: SSPC-SP6 / NACE No. 3 Commercial Blast-Cleaning to create a dense, uniform angular surface profile of 2.0 mils minimum. For severe (immersion) exposure, SSPC-SP10 / NACE No. 2 Near-White Blast-Cleaning is required.
 - b. Apply Primer Type B. Field touchup with same primer.
4. Surfaces to be fire proofed need not be primed unless required by the fireproofing manufacturer or if jobsite exposure is expected to be inclement per item A. Where unprimed steel is to receive fireproofing, prepare steel surface as required by fireproofing manufacturer. If fireproofed surfaces are to be primed, provide primer as follows:
- a. Surface Preparation: SSPC-SP3 Power-Tool Cleaning.
 - b. Apply Primer Type C. Field touchup with same primer.
5. Exterior exposed (unpainted) surfaces and as otherwise indicated to receive galvanizing:
- a. Galvanize per ASTM A123 Class 55 minimum. Passivation agents are not permitted on galvanized metal that is to be painted. Provide vent holes per ASTM A385 at closed sections (such as HSS). Submit proposed location of vent holes for review by Engineer.
 - b. Connection hardware shall be hot-dip galvanized per ASTM A153 or F2329. Grade A325 high-strength bolt assemblies may be mechanically galvanized per ASTM B695 class 55 or hot-dip galvanized per ASTM F2329. Mating bolts and nuts shall receive the same zinc-coating process.
 - c. Repair all uncoated, damaged, or altered galvanized surfaces per ASTM A780.
- C. Do not prime the following surfaces unless otherwise indicated:
1. Connections to be field welded.
 2. Steel in contact with concrete.
 3. Surfaces to receive welded metal decking.
- D. Slip critical bolted connection surfaces shall either be unfinished & prepared per the RCSC or primed per item B3 or B4.
- E. Do not cover up work with finish materials until inspection is complete and work is approved by the Testing Agency.

2.5 SOURCE QUALITY CONTROL

- A. An independent Testing Agency will perform source quality control tests and submit reports, as specified in pertinent sections of Division 01.
- B. Steel Materials Testing:
1. No testing is required for materials identified in accordance with CBC Section 2202A.1 (heat number, grade stencil, etc.).
 2. Unidentified steel- General: Test all structural shapes. In addition, test to verify F_y and F_u values when engineering requirements exceed $F_y = 25$ ksi for design.
- C. Shop Welding Inspection:
1. Testing Agency shall inspect and certify all structural welds.
 2. Welder Qualifications: Welding inspector shall verify that all the welders are properly qualified prior to steel fabrication and state the qualifications of each welder in the welding inspection report.
 3. Welding Inspection: Continuous inspection required unless otherwise noted

- below. Comply with requirements of AWS D1.1, AWS D1.8 and AISC 341.
 - a. Welding Inspector shall check all welds, materials, equipment and procedures.
 - b. Welding Inspector shall provide reports certifying the welding is as required and has been done in conformity with the plans, specifications and codes.
 - c. Welding Inspector shall use radiographic, ultrasonic, magnetic particle, or any other necessary aid to visual inspection to assure adequacy of welds. Ultrasonic Testing (UT) shall be required for all complete joint penetration (CJP) welds of material 5/16 inch thick or greater.
- 4. Periodic Inspection Acceptable:
 - a. Single pass fillet welds not exceeding 5/16 inch.
 - b. Welding of studs to beams.
- D. Bolts, Nuts and Washers: Provide samples to Testing Agency for required testing, at no additional cost.
- E. High Strength Bolted Connections: Provide testing and verification of shop-bolted connections in accordance with RCSC specifications. Test all bolts at each connection.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

3.2 ERECTION

- A. Erect structural steel in compliance with AISC 303.
- B. Framing:
 - 1. Erect all structural steel true and plumb.
 - 2. Verify proper final alignment prior to making final connections.
- C. Field Connections:
 - 1. Workmanship of field bolted and welded connections shall conform in all respects to methods and tolerances specified for fabrication.
 - 2. Field weld components indicated on shop drawings. Sequence field welds to minimize built-up stress and distortion of the structural frame. Verify sequence with Engineer. Coordinate field welding schedule with Testing Laboratory.
 - 3. Welded Studs: Install in accordance with manufacturer's instructions and structural welding code AWS D1.1 and AWS D1.8.
- D. Templates: Provide bolt setting templates for all anchor bolts. Provide instructions for the setting of anchors and bearing plates, verify these items are set correctly as work progresses.
- E. Column base plates: Set level to correct elevations, support temporarily on steel wedges, shims, or leveling nuts where shown, until the supported members are plumbed and base plate is grouted.
 - 1. Grout solid the full bearing area under base plates prior to installation of floor and/or roof decks.
 - 2. Comply with manufacturer's instructions for high strength grout. Trowel grouted

surfaces smooth, splaying neatly to 45 degrees.

- F. Bolting - General:
1. Inspect mating surfaces to insure that bolt head and nut will have full bearing and that metal plies will mate flush between bolts.
 2. Install bolts in matching holes. Do not distort metal or enlarge holes by drifting during assembly. Remake mismatched components to achieve tolerances indicated.
 3. Holes mismatched in excess of 1/8 inch will be rejected.
 4. Holes mismatched less than 1/8 inch may be reamed to the next larger size bolt.
 5. Do not enlarge holes by flame cutting or air/arc ("plasma") cutting.
 6. Provide flat washer(s) at over-size holes.
 7. Provide washers for all conditions per RCSC Section 6 and under nuts to connected parts less than 1/4 inch thick.
 8. Provide ASTM F436 beveled washers when the slope of the surfaces of parts in contact with the bolt head or nut is greater than 1:20.
 9. Do not install bolts with damaged threads.
 10. Threads shall commence outside of the shear plane where noted as HSB-X on drawings..
- G. Bolting - Specific:
1. Machine Bolts (MB): Install and tighten to a snug condition (ST) such that laminated surfaces bear fully on one another, using an impact wrench or "full effort" of an installer using a standard spud wrench.
 2. High Strength Bolts in Bearing/Shear or Static Tension joints snug tight (ST):
 - a. Provide a hardened washer at the head/nut at slotted holes
 - b. Install and tighten as per Machine Bolts (MB) snug tight (ST) and other requirements of RCSC specification Section 8.
 - c. Use ASTM F436 washer only in snug tight connections with static tension loads.
 3. High Strength Bolts in Pretensioned joints (PT):
 - a. Provide ASTM F436 washer per requirements of RCSC Section 6.
 - b. Install and tighten in accordance with the requirements of RCSC Section 8.
 - c. Install bolts in all holes of the joint and compact the joint until the connected plies are in firm contact prior to pretensioning.
 - d. The following tightening methods and bolt type are acceptable for PT joints:
 - (a) Turn-of-the-nut pretensioning method
 - (b) Calibrated wrench pretensioning method
 - (c) Twist-off-type tension-control bolts
 - (d) Direct-tension-indicator washer pretensioning method.
 4. High Strength Bolts in Slip Critical (SC) joints:
 - a. Provide tensioning for High Strength Bolts (PT) per above.
 - b. Faying surfaces to be prepared per RCSC Section 3 and PART 2.
- H. Supports, Shoring and Bracing: Allow for erection loads and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing. Conform to requirements of all applicable laws and governing safety regulations. Resist imposed loads, including those of stored materials and equipment.
1. Provide all temporary supports, shoring and bracing necessary to achieve work of tolerances indicated.
 2. Provide all necessary temporary flooring, planking and scaffolding required for erection of steel, and support of erection machinery.
 3. Construction Loading: Do not overload the structure or temporary supports with stored materials, equipment or other loads.

4. Maintain temporary bracing and shoring until work is complete, and longer as required to ensure stability and safety of structure.
- I. Do not make final connections until structure is aligned to meet specified tolerances.

3.3 ERECTION TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.

3.4 FIELD QUALITY CONTROL

- A. The independent Testing Agency will perform field quality control tests, as specified in pertinent sections of Division 01.
- B. Field Welding Inspection: Conform to all requirements of section SOURCE QUALITY CONTROL.
- C. High Strength Bolting: Provide testing and verification of field-bolted connections in accordance with RCSC Section 9.
 1. Inspect mating surfaces.
 2. Test all materials prior to use. Use only materials meeting specified requirements.
 3. Inspector shall review installation and verify "full effort" with installers for ST joints and shall randomly manually verify "full effort" on 10 percent of installed bolts.
 4. Inspector shall verify installation for 100% of SC and PT joints.
 5. Review installation procedures for all types of HSB joints and verify installation of "Twist-off" and load-indicator type bolts.
 6. If any bolt fails testing, all bolts at the joint shall be loosened and re-tightened. Exception: Galvanized bolts shall be replaced prior to re-testing.
- D. Welded Studs: Test headed studs electro-magnetically welded through metal deck to directly to steel members as follows:
 1. Install minimum of two trial studs.
 2. Testing Agency shall bend studs with a hammer to minimum 30 degrees out of axis.
 3. Any failure shall require new studs be welded for another test and welding apparatus adjusted.

3.5 ADJUSTING

- A. Touch-up damaged finishes with compatible specified primer.
- B. Replace defective or damaged work with conforming work. Replace all defective work at Contractor's expense.
- C. Straighten materials by means that will not injure the materials.
- D. Replace defective or damaged work which cannot be corrected in the field with new work, or return defective items to the shop for repair.
- E. Architect/Engineer shall review all proposals for the repair or replacement of damaged, defective, or missing work.

- F. Pay expenses incurred by Owner for Architect/Engineer's costs for (re-)design and obtaining approvals of Authorities Having Jurisdiction (AHJ) necessitated by incomplete, inefficiently scheduled, improperly performed, defective or nonconforming work, as specified in pertinent sections of Division 01.
- G. Pay expenses due to re-testing and re-inspection necessitated by incomplete, inefficiently scheduled, improperly performed, defective or nonconforming work, as specified in pertinent sections of Division 01.

3.6 CLEANING AND PROTECTION

- A. Clean all surfaces upon completion of erection; leave free of grime and dirt. Remove unused materials, tools, equipment and debris from the premises and leave surfaces broomed clean.
- B. Protect work from damage by subsequent operations.

END OF SECTION

HGA
PROJECT #4952-002

06/05/2024
DSA SPC_V2

BUILDING 3000
MAINTENANCE OPERATIONS
WAREHOUSE & GARAGE
DSA 01-121159

BLANK PAGE

SECTION 051213

ARCHITECTURALLY EXPOSED STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes: Requirements for preparing and finishing architecturally exposed structural steel (AESS), supplementing the requirements on the Drawings and specified in Section 051200, "Structural Steel Framing".
- B. Related Requirements:
 - 1. Section 05 1 200 "Structural Steel Framing" requirements that also apply to AESS.
 - 2. Section 05 50 00 "Metal Fabrications".
 - 3. Section 05 51 13 "Metal Stairs".
 - 4. Section 09 96 00 "High-Performance Coatings" for surface preparation and priming requirements.

1.3 REFERENCES

- A. The codes and standards listed below form part of this Specification but are not issued to Suppliers. Each code or standard shall be the latest revision and addendum in effect on the date this Specification is issued for construction, unless noted otherwise. Except as modified by the requirements specified herein or the details of the drawings, work included in this Specification shall conform to the applicable provisions of these codes and standards.
 - 1. American Institute of Steel Construction (AISC): "Section 10, Architecturally Exposed Structural Steel, Code of Standard Practice for Steel Buildings and Bridges".
 - 2. The Society for Protective Coatings (SSPC): "Steel Structures Painting Manual, Volume 2, Systems and Specifications".

1.4 DEFINITIONS

- A. Architecturally Exposed Structural Steel: Structural steel to be left exposed in the completed Work and designated as "architecturally exposed structural steel" or "AESS" in the Contract Documents.

1.5 COORDINATION

- A. Coordinate surface preparation requirements for shop-primed items.

- B. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

1.6 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Before the start of Work, meet at the Project site to review methods and sequence of installation, special details and conditions, quality standards, testing and quality control requirements, job organization and other pertinent topics related to the Work. The meeting shall include the Owner, Architect, Architect's consultants, Contractor, and subcontractors whose work is relevant to this Specification Section.

1.7 ACTION SUBMITTALS

- A. Product Data:

1. Tension-control, high-strength, bolt-nut-washer assemblies.
2. Corrosion-resisting (weathering steel), tension-control, high-strength, bolt-nut-washer assemblies.
3. Filler.
4. Primer.
5. Galvanized-steel primer.
6. Etching cleaner.
7. Galvanized repair paint.

- B. Shop Drawings: Show fabrication of AESS components.

1. Identify AESS category for each steel member and connection, including transitions between AESS categories and between AESS and non-AESS.
2. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
3. Include embedment Drawings.
4. Indicate orientation of mill marks and HSS seams.
5. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain. Indicate grinding, finish, and profile of welds.
6. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections. Indicate orientation and location of bolt heads.
7. Indicate exposed surfaces and edges and surface preparation being used.
8. Indicate special tolerances and erection requirements.
9. Indicate weep holes for HSS.
10. Indicate surface preparation, primer, and coating requirements, including systems specified in other Sections. Provide product information for High Performance Coatings specified in Section 099600, in conjunction with this submittal

- C. Samples: Submit for Architect's action. Furnish sufficient samples to establish full range of colors and textures for materials exposed in the finished Work. Label samples to indicate product and location in the Work. Samples will be reviewed for appearance only. Compliance with other requirements is the responsibility of the Contractor. Furnish samples to show each type of weld in 8-inch length, the surface cleaning and painting required for the Work.

- D. Certifications: Submit for Structural Engineer's / Architect's information. Furnish certified test reports for the following:
1. Welding: Furnish welding certificates and details of welding procedures, including tack and sealing welds. Procedures and sequences shall minimize the effect of weld shrinkage and residual stresses.
- E. Quality Assurance/Quality Control Submittals: Submit for Architect's information.
1. Certificates:
 - a. Document Review: Submit a written statement signed by the Contractor and the Applicator stating that the Contract Documents, shop drawings and product data have been reviewed with qualified manufacturer representatives. The statement shall certify that selected materials are proper, compatible with contiguous materials and adequate for the application shown.

1.8 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and fabricator.
- B. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

1.9 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category BU, or is accredited by the IAS Fabricator Inspection Program for Structural Steel (AC 172) and is experienced in fabricating AESS similar to that indicated on this Project.
- B. Installer Qualifications: A qualified Installer who participates in the AISC Quality Certification Program, is designated an AISC-Certified Erector, Category ACSE, and is experienced in erecting AESS similar to that indicated on this Project, with 5 years' experience in the installation of specified materials on comparable projects. The firm shall have the approval of the materials manufacturer.
- C. Regulatory Requirements: Comply with applicable requirements of the laws, codes, and regulations of Authorities Having Jurisdiction (AHJs). Obtain necessary approvals from AHJs.
- D. Mockups: Build mockups of AESS to set quality standards for fabrication and installation.
 1. Build mockup of typical portion of AESS as shown on Drawings.
 2. Coordinate high-performance coatings requirements with Section 09 9600 "High-Performance Coatings."
 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Use special care in handling AESS to prevent twisting, warping, nicking, and other damage during fabrication, delivery, and erection. Store materials to permit easy access for inspection and identification. Keep AESS members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect AESS members and packaged materials from corrosion and deterioration.
 - 1. Do not store AESS materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

1.11 FIELD CONDITIONS

- A. Field Measurements: Where AESS is indicated to fit against other construction, verify actual dimensions by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Comply with requirements of ANSI/AISC 303, Sections 1 through 9 and as modified in Section 10, "Architecturally Exposed Structural Steel."

2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. Tension-Control, High-Strength, Bolt-Nut-Washer Assemblies: ASTM F3125/F3125M, Grade F1852, Type 1, round-head assemblies consisting of steel structural bolts with splined ends; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers.

2.3 FILLER

- A. Polyester filler intended for use in repairing dents in automobile bodies.

2.4 PRIMER

- A. Steel Primer:
 - 1. Comply with Section 09 96 00 "High-Performance Coatings."

2.5 FABRICATION

- A. Shop fabricate and assemble AESS to the maximum extent possible. Locate field joints at concealed locations if possible. Detail assemblies to minimize handling and to expedite erection.
- B. Category AESS 1: Not used.
- C. Category AESS 2: At all locations unless otherwise noted.
 - 1. Comply with overall profile dimensions of AWS D1.1/D1.1M for welded built-up members. Keep appearance and quality of welds consistent. Maintain true alignment of members without warp exceeding specified tolerances.
 - 2. Prepare surfaces according to Part 2 "Shop Priming" Article and SSPC-SP 6 (WAB)/NACE WAB-3.
 - 3. Grind sheared, punched, and flame-cut edges to remove burrs and provide smooth surfaces and eased edges.
 - 4. Make intermittent welds appear continuous, using filler or additional welding.
 - 5. Seal weld open ends of hollow structural sections with 3/8-inch closure plates.
 - 6. Limit butt and plug weld projections to 1/16 inch.
 - 7. Install bolt heads on the same side of each connection and maintain orientation consistently from one connection to another.
 - 8. Remove weld spatter, slivers, and similar surface discontinuities.
 - 9. Remove blemishes and surface irregularities resulting from temporary braces or fixtures by filling or grinding, before cleaning, treating, and shop priming.
 - 10. Grind tack welds smooth unless incorporated into final welds.
 - 11. Remove backing and runoff tabs, and grind welds smooth.
 - 12. Limit as-fabricated straightness tolerance to one-half that permitted for structural-steel materials in ANSI/AISC 303.
 - 13. Limit as-fabricated curved structural steel tolerance to that permitted for structural-steel materials in ANSI/AISC 303.
 - 14. Limit as-fabricated straightness tolerance of welded built-up members to one-half that permitted by AWS D1.1/D1.1M.
 - 15. Conceal fabrication and erection markings from view in the completed structure.
 - 16. Make welds uniform and smooth.
- D. Category AESS 3: Not used.
- E. Category AESS 4: At interior stairs, guard rails, and exterior canopy construction elements indicated on Drawings.
 - 1. Comply with overall profile dimensions of AWS D1.1/D1.1M for welded built-up members. Keep appearance and quality of welds consistent. Maintain true alignment of members without warp exceeding specified tolerances.
 - 2. Prepare surfaces according to Part 2 "Shop Priming" Article and SSPC-SP 6 (WAB)/NACE WAB-3.
 - 3. Grind sheared, punched, and flame-cut edges to remove burrs and provide smooth surfaces and eased edges.
 - 4. Make intermittent welds appear continuous, using filler or additional welding.
 - 5. Seal weld open ends of hollow structural sections with 3/8-inch closure plates.
 - 6. Limit butt and plug weld projections to 1/16 inch.
 - 7. Install bolt heads on the same side of each connection and maintain orientation consistently from one connection to another.

8. Remove weld spatter, slivers, and similar surface discontinuities.
9. Remove blemishes and surface irregularities resulting from temporary braces or fixtures by filling or grinding, before cleaning, treating, and shop priming.
10. Grind tack welds smooth unless incorporated into final welds.
11. Remove backing and runoff tabs, and grind welds smooth.
12. Limit as-fabricated straightness tolerance to one-half that permitted for structural-steel materials in ANSI/AISC 303.
13. Limit as-fabricated curved structural steel tolerance to that permitted for structural-steel materials in ANSI/AISC 303.
14. Limit as-fabricated straightness tolerance of welded built-up members to one-half that permitted by AWS D1.1/D1.1M.
15. Conceal fabrication and erection markings from view in the completed structure.
16. Make welds uniform and smooth.
17. Cut out mill marks from mill material or hide these markings from view in the completed structure. Where neither method is possible, remove mill marks by grinding and filling surfaces as approved by Architect.
18. Grind butt and plug welds smooth or fill, removing weld splatter exposed to view.
19. Orient HSS seams as indicated or away from view.
20. Align and match abutting member cross sections.
21. At visible open joints of copes, miters, and cuts, maintain uniform clear gaps of 1/8 inch. At closed joints, maintain uniform contact within 1/16 inch.
22. Fabricate with exposed surfaces smooth, square, and of surface quality approved by Architect.
23. Treat HSS seams to appear seamless.
24. Contour and blend welds and weld transitions between members, removing splatter exposed to view.
25. Fill surface imperfections with filler and sand smooth to achieve surface quality approved by Architect.
26. Minimize weld show-through and distortion on the opposite side of exposed connections by grinding to a smooth profile aligned with adjacent material.

- F. Cleaning Corrosion-Resisting (Weathering) AESS: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 6 (WAB)/NACE WAB-3.

2.6 MATERIALS

- A. Comply with requirements specified in Section 05 12 00, "Steel Framing".

2.7 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
- C. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding specified tolerances.
- D. Use weld sizes, fabrication sequence, and equipment for AESS that limit distortions to allowable tolerances.

- E. Remove backing bars or runoff tabs; back-gouge and grind steel smooth.
- F. At locations where welding on the far side of an exposed connection, grind distortions and marking of the steel to a smooth profile aligned with adjacent material.
- G. Make fillet welds oversize and grind to uniform profile with smooth face and transition.

2.8 GALVANIZING

- A. Surface Preparation Prior to Galvanizing: In accordance with SSPC Specification SP-10, "Near White Blast Cleaning."
- B. Provide zinc coating using the hot-dip process after fabrication for AESS exposed to exterior atmosphere.
- C. Do not quench or apply post-galvanizing treatments that might interfere with paint adhesion.
- D. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A123/A123M.

2.9 SHOP PRIMING

- A. Shop prime steel surfaces, except the following:
 - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
 - 2. Surfaces to be field welded.
 - 3. Surfaces to be high-strength bolted with slip-critical connections.
 - 4. Galvanized surfaces unless indicated to be painted.
- B. Removal soluble salts prior any surface preparation.
- C. Surface Preparation for Structural Steel Custom Elements: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according SSPC-SP 10, "Near White Blast Cleaning."
- D. Surface Preparation for Galvanized Surfaces, if Applicable: Surfaces shall be cleaned and profiled prior to receiving applied coatings in accordance with ASTM D6386.
- E. Surface Preparation: Clean nongalvanized surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
 - 1. SSPC-SP 6 (WAB)/NACE WAB-3.
- F. Preparing Galvanized Steel for Shop Priming: After galvanizing, thoroughly clean steel of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner or according to SSPC-SP 16.
- G. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5

mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

1. Stripe paint corners, crevices, bolts, welds, and eased edges.
2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

2.10 FABRICATION

A. General:

1. Shop-fabricate and assemble AESS to the maximum extent possible.
 - a. Locate field joints at concealed locations if possible.
Detail assemblies to minimize handling and to expedite erection.

B. Fabricate with exposed surfaces smooth, square, and free of surface blemishes including pitting, rust, scale, and roughness.

C. Remove blemishes by filling or grinding or by welding and grinding, before cleaning, treating, and shop priming.

D. Fabricate with piece marks fully hidden in the completed structure or made with media that permits full removal after erection.

2.11 FINISHING

A. Finish Coating: Field-apply per Specifications Section 09 96 00 "High Performance Coatings".

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify, with steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedment for compliance with requirements.

B. Verification of Conditions: Before starting work, examine adjoining work on which execution is in any way dependent for workmanship and fit. Give written notification of any existing deficiencies detrimental to proper and timely installation of work under this Section.

C. Examine AESS for twists, kinks, warping, gouges, and other imperfections before erecting.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep AESS secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

3.3 EXAMINATION

- A. Verification of Conditions: Before starting work, examine adjoining work on which execution is in any way dependent for workmanship and fit. Give written notification of any existing deficiencies detrimental to proper and timely installation of work under this Section. Do not proceed until conditions are satisfactory.

3.4 ERECTION

- A. Take special care during erection to avoid marking or distorting the AESS and to minimize damage to shop painting. Set AESS accurately in locations and to elevations indicated and according to ANSI/AISC 303 and ANSI/AISC 360.

1. Remove welded tabs that were used for attaching temporary bracing and safety cabling and that are exposed to view in the completed Work. Take care to avoid any blemishes, holes, or unsightly surfaces resulting from the use or removal of temporary elements.
2. Grind tack welds smooth.
3. Remove backing and runoff tabs, and grind welds smooth.
4. Orient bolt heads on the same side of each connection and maintain orientation consistently from one connection to another.
5. Conceal fabrication and erection markings from view in the completed structure.

- B. In addition to ANSI/AISC 303, Section 10 requirements, comply with the following.

1. Erection of Category AESS 2:

- a. Erect AESS to the standard frame tolerances specified in ANSI/AISC 303 for non-AESS.
- b. Comply with AWS D1.1/D1.1M. Keep appearance and quality of welds consistent. Maintain true alignment of members without warp exceeding specified tolerances.
- c. Remove weld spatter, slivers, and similar surface discontinuities.
- d. Grind off butt and plug weld projections larger than 1/16 inch.
- e. Continuous welds shall be of uniform size and profile.
- f. Ream holes that must be enlarged. Use of drift pins or burning is not permitted. Replace misaligned connection plates where holes cannot be aligned with acceptable appearance.
- g. Splice members only where indicated on Drawings.
- h. No torch cutting or field fabrication is permitted.

2. Erection of Category AESS 4:

- a. Erect AESS to the standard frame tolerances specified in ANSI/AISC 303 for non-AESS.
- b. Comply with AWS D1.1/D1.1M. Keep appearance and quality of welds consistent. Maintain true alignment of members without warp exceeding specified tolerances.
- c. Remove weld spatter, slivers, and similar surface discontinuities.
- d. Grind off butt and plug weld projections larger than 1/16 inch.
- e. Continuous welds are to be of uniform size and profile.
- f. Ream holes that must be enlarged. Use of drift pins or burning is not permitted. Replace misaligned connection plates where holes cannot be aligned with acceptable appearance.

- g. Splice members only where indicated on Drawings.
- h. No torch cutting or field fabrication is permitted.
- i. Weld profiles, quality, and finish are to be as approved by Architect.
- j. Make joint welds, including tack welds, appear continuous by filling intermittent welds.
- k. Grind welds smooth.
- l. Minimize weld show-through and distortion on the opposite side of exposed connections by grinding to a smooth profile aligned with adjacent material.
- m. Oversize welds where ground, contoured, or blended, and grind to provide a smooth transition, matching profile approved by Architect.

3.5 FIELD CONNECTIONS

- A. General: As specified under Section 05 12 00 "Structural Steel", except as modified under Paragraph Fabrication of this Section.
- B. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified. Orient heads in same direction.
- C. Weld Connections: Comply with AWS D1.1 and AWS D1.8 for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

3.6 REPAIR

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and touchup galvanizing to comply with ASTM A780/A780M.
- B. Remove welded tabs exposed to view where used for attaching temporary supports and grind steel smooth.
- C. Repair or replace damaged materials that cannot be repaired in field to meet appearance requirements specified.
- D. Touchup Painting:
 - 1. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting, to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - a. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
 - 2. Cleaning and touchup painting are specified in Section 09 96 00 "High-Performance Coatings."
- E. Touchup Priming: Cleaning and touchup priming are specified in Section 09 96 00 "High-Performance Coatings."

3.7 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to inspect AESS as specified in Section 051200 "Structural Steel Framing." The testing agency is not responsible for enforcing requirements relating to aesthetic effect.
- B. Architect will observe AESS in place to determine acceptability relating to aesthetic effect.

END OF SECTION

SECTION 05 30 00

METAL DECKING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: All material, labor, equipment and services necessary for the fabrication, erection, and completion of all metal decking as noted on drawings, including all supports for erection. The work shall include, but not necessarily be limited to the following:
1. Furnish metal decking, supports at structural steel, closures, flashing, weld plates, and necessary accessories, complete and ready to receive concrete or roofing.
 2. Install metal decking including cutting, fitting, and welding.
 3. All cutting and reinforcing of openings as required, and as laid out by other trades.
- B. Related Sections:
1. Pertinent Sections of Division 01 Specifying Quality Control and Testing Agency Services
 2. Pertinent Sections of Division 03 Specifying Concrete Construction
 3. Pertinent Sections of Division 05 Specifying Structural Steel

1.2 REFERENCES

- A. California Code of Regulations, Title 24, latest adopted edition (herein noted as CBC): Chapter 19A Concrete, Chapter 22A Steel.
- B. American Iron and Steel Institute (AISI) S100 "North American Specification for the Design of Cold-Formed Steel Structural Members".
- C. Steel Deck Institute (SDI) "Design Manual for Composite Decks, Form Decks and Roof Decks".
- D. International Code Council (ICC) "Acceptance Criteria (AC) 43 – Steel Deck Roof and Floor Systems".
- E. American Society for Testing and Materials (ASTM):
1. ASTM A653 "Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process".
 2. ASTM A780 "Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings".
 3. ASTM A1003 "Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members".
 4. ASTM A1008 "Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable".
 5. ASTM C1513 "Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections".

- F. American Welding Society (AWS) "D1.3 Structural Welding Code – Sheet Steel".

1.3 SUBMITTALS

- A. Shop drawings shall indicate all details of layout, fabrication and installation, location and dimension of openings, reinforcing and accessories, metal closures and flashing and type, size and location of all welds, and electromagnetically welded studs. Submit shop drawings before the start of fabrication. All details must reference detail callouts on the construction documents. Submittals that do not meet these requirements will be returned for correction without review.
- B. Current ICC reports indicating design values.
- C. Obtain reviewed structural steel shop drawings and verify all conditions before preparing shop drawings for metal decking; show all members required for support of metal decking on shop drawings for metal decking.
- D. The Contractor shall review and approve shop drawings prior to submittal. The Architect's review is of a general nature only and all responsibility for conformance with drawings and specifications and for dimensions shall remain with the Contractor.

1.4 QUALITY ASSURANCE

- A. All work under this section shall be fabricated and installed in strict accordance with the incorporated documents. Refer to pertinent sections of Division 05, Structural Steel.
- B. Decking shall be installed in the field by an approved steel deck applicator with at least five years demonstrated successful experience in this type work.
- C. All installation and welding shall be done by qualified, experienced workers skilled in their trade, in conformance with established standards of good practice and the manufacturer's recommendations. All welders shall be AWS certified.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Protection: Steel decking sheets shall be covered and protected from weather during transit and during storage at the job site. Sheets shall not be in contact with the ground and are to have a waterproof covering.

1.6 JOB CONDITIONS

- A. Coordination: The Contractor shall secure all field measurements necessary for the completion of this work. The Contractor shall be responsible for all errors of detailing and fabrication and for the correct fitting of all metal decking to each other and to their supports. Provide holes and reinforcement for mechanical and electrical penetrations.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Deck shall be of type and by manufacturer as specified on the drawings or approved equal. All equals must meet or exceed ICC approved design values of specified decking.
- B. Steel decking and flashing shall be formed from steel sheets conforming to ASTM A653, A1003, or A1008 with a minimum yield strength of 40,000 psi. Before forming, the steel shall receive a protective metal coating of zinc conforming to ASTM A653 G60 wiped coating.
- C. Deck Sections
 - 1. Deck units shall be supplied in lengths to span over at least 3 supports where layout permits. All single span units shall have temporary mid-span shoring.
 - 2. All deck units shall be provided with either an interlocking side lap or a lapping type of side lap.
 - 3. Venting Devices: Unless noted otherwise, all deck sections to receive cementitious fill shall be vented using individual separating clips of type, style and spacing recommended by deck manufacturer (space no more than 48" o.c. or a two per deck span) or built-in venting-slot formed as an integral part of deck profile. Venting slots are required only in non-cellular deck. Tabs shall be turned up into deck so that they cannot be used for hangers. Provide three rows of slots at 2'-0" on centers in three foot wide deck sections.
 - 4. Flashing and Closure Plates: Provide 16 gauge zinc coated continuous flashing for deck units as detailed, or as required, at ends and sides, at openings and at deck perimeter to contain fill. Flashing shall be detailed and installed to prevent concrete leakage.
 - 5. Reinforcing at openings and penetrations: Provide reinforcing at all openings and penetrations per PART 3.
 - 6. Galvanization Coating Repair: Zinc dust-zinc oxide primer, ASTM A780.
- D. Headed welded studs and deformed bar anchors: See section 05 1200 or 05 1100.
- E. Painted Finish: Where painted finish is specified it shall be Manufacturer's standard; baked on, rust inhibitive, applied to chemically cleaned surface.
- F. Welding Electrodes: AWS Standard E60 or equivalent or E70 or equivalent, or as specified by AWS D1.3 and Manufacturer's recommendation.

2.2 FABRICATION

- A. All fabrication bevel cuts, etc. shall be done in the shop, and shall be equal to a high standard of workmanship. All deck units shall be shipped to the field in standard widths and in precut lengths so that end joints occur over supporting members.
- B. Deck section shall be cut to fit all openings, which are required. Dimensions of openings and holes required for the work of other trades will be provided by respective trades for cutting of deck.
- C. Misalignment of deck sections and cuts, short lengths, and poor workmanship shall be cause for rejection. All rejected work shall be replaced at the Contractor's expense.

2.3 SOURCE QUALITY CONTROL

- A. An independent testing agency will perform source quality control tests and submit reports as specified in pertinent sections of Division 01.
- B. Steel Materials Testing:
 - 1. No Testing Required for Materials as follows:
 - a. Materials identified in accordance with CBC 2202A.1 and ASTM A6. (heat number, grade stencil, etc.)
 - b. Materials accompanied by certified mill test reports for all members, and Contractor's affidavit confirming that all materials used in the fabrication and shipped to the job are from the grades specified and match the certificates supplied.
 - 2. Unidentified steel: Where identification of materials by heat number or mill reports cannot be made, testing agency shall test unidentified deck.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The steel deck units shall be placed on the supporting framework, aligned, and adjusted to final position before being permanently fastened. Each unit shall be brought to proper bearing on the supporting beams. If the supporting beams are not properly aligned or sufficiently level to permit proper bearing of the steel units, the Contractor shall notify the Architect prior to taking corrective action to insure properly aligned work.
- B. Deck units shall be placed in straight alignment for the entire length of run with close registration of the cells of one unit with those of abutting and adjoining units. Provide a minimum of 2 inch end bearing at abutting deck units. Continuous deck units shall be provided with a minimum of 3" bearing, all butt joints shall be "tight" (no gap).
- C. Deck units shall not be placed on supporting members until all structural steel is completely installed, plumbed, and connections are completed.
- D. Welding:
 - 1. Steel deck units shall be fastened to the steel framework by the arc welding process. Welds shall be free of sharp points or edges.
 - 2. All welding shall be done by competent experienced welders, thoroughly familiar with the metal to be welded, and certified for welding of light gauge metal.
 - 3. Deck sheets shall be welded to the supporting member and to each other with welds as listed below unless otherwise noted on the drawings.
 - a. End and intermediate support perpendicular to deck flutes: 3/4" diameter spot weld at each flute.
 - b. Side joints between individual deck units with side interlock joint: 1-1/2" top or side seam weld at 12" on center. Button punch at 36" on center before welding to draw units together.
 - c. Side joints between individual deck units where concrete is placed on the metal deck is to be button punched at 36" on center.
 - d. Boundary deck units to parallel supports and interior deck units to parallel framing supports 3/4" diameter spot weld or 3/8" x 1-1/4" arc seam weld at 12" on center.
 - 4. Weld all closure angles and plates with 3/4" diameter spot weld or 3/8"x 1-1/4" arc seam welds at 18" apart.

5. Headed welded studs and deformed bar anchors: See section 05 1200 or 05 1100.
- E. Screw Attachment: When called for on the drawings, painted roof deck is to be attached with galvanized #12 hex head metal screws with neoprene washers at flutes and at 24" on center at side laps and at 12" on center at perimeter side laps. Screws and metal washers shall be painted to match deck color where decking is a painted finish surface.
- F. Decking shall be installed in a continuous operation to avoid delays in the construction.
- G. Opening reinforcement shall be as detailed on the drawings. Cutting of holes other than those detailed on the drawings shall be done only as specifically approved by the Architect. Holes not shown on structural drawings shall be cut and reinforced in accordance with details on drawings. In general, reinforcing is not required for holes less than 4" in diameter. Holes at column penetrations shall be reinforced as any other hole. See details on drawings for other requirements.
- H. Leave slag in place at welds to be covered by concrete. Elsewhere, remove slag to bright metal and touch up all welds and field cut edges with galvanization repair primer.
- I. Field Finishing:
 1. Permanently exposed galvanized surfaces requiring welding shall be thoroughly cleaned by wire brushing after welding and then touched up with galvanization repair primer.
 2. After erection all damaged surfaces shall be primed.
 3. Painted deck shall be touched up with primer and matching paint.

3.2 FIELD QUALITY CONTROL

- A. Welding Inspection:
 1. Testing Agency shall inspect and certify all structural welds. Submit certification to the Architect/Engineer for review and the Building Official for approval.
 2. Welder Qualifications: Welding inspector shall verify that all the welders are properly qualified prior to steel fabrication and state the qualifications of each welder in the welding inspection report.
 3. Welding Inspection:
 - a. Welding Inspector shall check all welds, materials, equipment and procedures.
 - b. Welding Inspector shall provide reports certifying the welding is as required and has been done in conformity with the plans, specifications and codes.
 - c. Periodic inspection per CBC is acceptable.

3.3 DEFECTIVE WORK

- A. All work not in conformance with these specifications and/or generally accepted standards of the trade, will be deemed defective by the Architect and will be rejected. All work that is defective shall be corrected or replaced as directed by the Architect. Corrections redesign, and replacement of defective work shall be at Contractor's expense.

3.4 CLEANING

- A. After erection, all surfaces shall be cleaned and left free of all grime and dirt. Decking shall be cleaned with solvents, if necessary to provide a surface, which will readily bond with concrete fill and direct-to-steel fireproofing. Remove unused materials, tools, scaffolding and debris from the premises and leave the area broom clean.

END OF SECTION

SECTION 05 40 00

COLD-FORMED METAL FRAMING

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. All design and other services, material, labor and equipment as necessary for the fabrication, erection and completion of all cold formed metal framing including all bracing and shoring required for erection, miscellaneous metal, and related work.
- B. Related Sections:
 - 1. Pertinent Sections of Division 01 Specifying Quality Control and Testing Agency Sections
 - 2. Pertinent Sections of Division 05 Specifying Structural Steel.

1.2 REFERENCE STANDARDS

- A. California Code of Regulations, Title 24, latest adopted edition (herein noted as CBC): Chapter 22A Steel.
- B. American Iron and Steel Institute (AISI) S100 "North American Specification for the Design of Cold-Formed Steel Structural Members".
- C. AISI S200 "North American Standard for Cold-Formed Steel Framing – General Provisions".
- D. AISI D100 "Cold-Formed Steel Design Manual.
- E. American Welding Society (AWS) D1.3 "Structural Welding Code – Sheet Steel"
- F. American Society for Testing and Materials (ASTM):
 - 1. ASTM A307 "Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60000 PSI Tensile Strength".
 - 2. ASTM A606 "Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance".
 - 3. ASTM A653 "Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process".
 - 4. ASTM A780 "Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings".
 - 5. ASTM A1003 "Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members".
 - 6. ASTM A1008 "Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable".
 - 7. ASTM A1011 "Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength".
 - 8. ASTM C645 "Standard Specification for Nonstructural Steel Framing Members".

9. ASTM C754 "Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products".
 10. ASTM C955 "Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases".
 11. ASTM C1007 "Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories".
 12. ASTM C1513 "Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections".
- G. The Society for Protective Coatings (SSPC) SSPC-Paint20 "Zinc-Rich Coating (Inorganic or Organic)".

1.3 SUBMITTALS

- A. Shop Drawings
1. Show size and locations of all framing members in conformance to the criteria shown on the drawings.
 2. Shop and field assembly details, including cuts and connections. All details must reference detail callouts on the construction documents.
 3. Type and location of shop and field welds, screws, bolts, and fastening devices.
 4. General Contractor shall review and approve shop drawings prior to submittal.
 5. Shop drawing submittals that do not meet these requirements will be returned for correction without review.
- B. Manufacturer's Literature:
1. Descriptive data illustrating cold-formed framing system components including framing members, fasteners, and accessories, including ICC-ES reports.
 2. Erection instructions containing sequence of operations.
- C. Samples: Provide adequate samples of unidentified material to the Owner's Testing Laboratory for testing purposes.

1.4 QUALITY ASSURANCE

- A. Erector Qualifications:
1. Minimum of three years successful experience on comparable cold-formed metal framing projects.
 2. Welders qualified in accordance AWS D1.3.
- B. Cold form carbon and low alloy steel used for structural purposes shall be identified per CBC Section 2202A.1.
- C. Welding inspections shall conform to AWS D1.3 and CBC 1705A.2.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Members of the "Steel Stud Manufacturers Association (SSMA)" with products meeting ICC-ES ESR-3064P. Members of the "Certified Steel Stud Association (CSSA)" with products meeting ICC-ES ESR-3016.

2.2 MATERIALS

- A. Steel Framing System:
 - 1. All stud and/or joist framing members shall be of the type & size as shown on the plans and reviewed shop drawings.
 - 2. All runner and end tracks, bridging, and non-load bearing studs shall be of the type & size shown on the plans.
 - 3. All studs, joists, and tracks 54 mils or greater in thickness shall be formed from steel that corresponds to the requirements of ASTM A1003 (Grade ST50H or ST50L) with a minimum yield of 50,000 psi.
 - 4. All studs, joists, track, bridging, U-channel, (hat) furring (F) channels, and accessories 43 mils or thinner in thickness shall be formed from steel that corresponds to the requirements of ASTM A1003 (Grade ST33H or ST33L) with a minimum yield of 33,000 psi.
 - 5. All stud and joist components shall be formed from steel having a minimum G-60 galvanized coating (equivalent coatings such as "G60e" are not acceptable), unless noted otherwise, or shall be primed with paint meeting the performance requirements SSPC-Paint20, where noted.
 - 6. Welding Electrodes: Shall conform to AWS D1.3. E60 or E70. Touch up all welds with zinc-rich paint in compliance with ASTM A780.
 - 7. Primer: SSPC-Paint20.
- B. Screws shall be per ASTM C1513.
- C. Machine bolts shall be per ASTM A307.
- D. Powder Driven Pins (PDP): Hilti X-U, ICC ESR-2269. For use only where specified by the drawings.
- E. Accessories: Cold-formed metal framing manufacturer's standard.

2.3 FABRICATION

- A. Form members to manufacturer's standard shapes meeting design criteria.
- B. Cut right angle connections of framing components to fit squarely against abutting members.
- C. Prime un-galvanized steel to 1.5 mil (0.038) minimum dry film thickness.

PART 3 – EXECUTION

3.1 ERECTION

- A. Clean surfaces that will be in contact after assembly.
- B. Position members plumb, square and true to line.

- C. Seat studs squarely in track with stud web and flange abutting track web with maximum 1/8 inch gap.
- D. Connect members together by welding and/or fasteners in accordance with the drawings.
- E. Do not splice studs. Provide "headers" and "trim studs" at openings as required. Studs shall be securely attached to tracks at all exterior walls except as noted below.
- F. Provide for expansion and contraction between floors at solid wall sections of two stories or more by providing a slip joint between stud and track at one end. This connection shall be capable of transmitting lateral loads to the structure.
- G. Provide and install bridging, fire blocking, etc. per manufacturer's recommendations, the plans, and code requirements.
- H. Perform welding in accordance with AWS D1.3
- I. Remove erection bolts and screws used in welded construction.
- J. Do not use gas cutting for field correction of fabrication without concurrence of Architect/Engineer.
- K. Touch-up field connections and breaks in shop coating with same primer used for shop priming.

3.2 DEFECTIVE WORK AND MATERIALS

- A. Work found to be defective, missing or damaged shall be immediately replaced with proper work. Such replaced work and the inspection for same shall be at the expense of the Contractor.
- B. Straightening of any materials, if necessary, shall be done by a process and in a manner that will not injure the materials, and which is approved by the Architect. Sharp kinks or bends shall be cause for rejection. Heating will not be allowed.
- C. If defects or damaged work cannot be corrected in the field, the material shall be returned to the shop or new parts furnished, as the Architect directs; the Contractor shall replace all work at his own expense.

3.3 CLEANING

- A. After erection, all surfaces shall be cleaned and left free of all grime and dirt. Remove unused materials, tools, equipment and debris from the premises and leave broom clean.

END OF SECTION

SECTION 05 50 00

METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Steel framing and supports for ceiling-hung toilet compartments.
2. Steel framing and supports for overhead doors.
3. Steel framing and supports for countertops.
4. Steel framing and supports for applications where framing and supports are not specified in other Sections.
5. Elevator machine beams, hoist beams, and divider beams.
6. Steel shapes for supporting elevator door sills and supplemental guardrails.
7. Shelf angles.
8. Metal ladders.
9. Elevator pit ladders.
10. Abrasive metal nosings.

B. Products furnished, but not installed, under this Section include the following:

1. Loose steel lintels.
2. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
3. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

C. Related Requirements:

1. Section 03 30 00 "Cast-in-Place Concrete" for installing anchor bolts, steel pipe sleeves, slotted-channel inserts, wedge-type inserts, and other items cast into concrete.
2. Section 05 12 00 "Structural Steel Framing" for steel framing, supports, elevator machine beams, hoist beams, divider beams, door frames, and other steel items attached to the structural-steel framing.
3. Section 09 96 00 "High Performance Coatings".

1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.4 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Nonslip aggregates and nonslip-aggregate surface finishes.
 - 2. Fasteners.
 - 3. Shop primers.
 - 4. Shrinkage-resisting grout.
 - 5. Manufactured metal ladders.
 - 6. Abrasive metal nosings.
- B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for the following:
 - 1. Steel framing and supports for ceiling-hung toilet compartments.
 - 2. Steel framing and supports for overhead doors.
 - 3. Steel framing and supports for countertops.
 - 4. Steel framing and supports for applications where framing and supports are not specified in other Sections.
 - 5. Elevator machine beams, hoist beams, and divider beams.
 - 6. Steel shapes for supporting elevator door sills and supplemental guardrails.
 - 7. Shelf angles.
 - 8. Metal ladders.
 - 9. Elevator pit ladders.
 - 10. Abrasive metal nosings.
- C. Samples for Verification:
 - 1. For each finish specified, minimum 4 inches square.
 - 2. For each type and finish of extruded nosing and tread.
- D. Delegated-Design Submittal:
 - 1. For ladders, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For professional engineer's experience with providing delegated-design engineering services of the kind indicated, including documentation that engineer is licensed in the jurisdiction in which Project is located.
- B. Mill Certificates: Signed by stainless steel manufacturers, certifying that products furnished comply with requirements.
- C. Welding certificates.
- D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- E. Research Reports: For post-installed anchors, from ICC-ES.

1.6 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
 - 3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls, floor slabs, decks, and other construction contiguous with metal fabrications by field measurements before fabrication

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design ladders.
- B. Structural Performance of Aluminum Ladders: Ladders shall withstand the effects of loads and stresses within limits and under conditions specified in ANSI A14.3.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- C. Stainless Steel Sheet, Strip, and Plate: ASTM A240/A240M or ASTM A666, Type 316L.
- D. Stainless Steel Bars and Shapes: ASTM A276/A276M, Type 316L.
- E. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.
- F. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
 - 1. Size of Channels: 1-5/8 by 1-5/8 inches.
 - 2. Material: Galvanized steel, ASTM A653, commercial steel, Type B, Grade 33, with G90 coating; 0.108-inch nominal thickness.
- G. Aluminum Plate and Sheet: ASTM B209, Alloy 6061-T6.
- H. Aluminum Extrusions: ASTM B221, Alloy 6063-T6.

2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 OR Type 316 stainless steel fasteners (as shown on Drawings) for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
 - 1. Provide stainless steel fasteners for fastening aluminum, stainless steel and at all conditions exposed to exterior elements.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563; and, where indicated, flat washers.
- C. High-Strength Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 3, heavy-hex steel structural bolts; ASTM A563, Grade DH3, heavy-hex carbon-steel nuts; and where indicated, flat washers.
- D. Stainless Steel Bolts and Nuts: Regular hexagon-head annealed stainless steel bolts, ASTM F593; with hex nuts, ASTM F594; and, where indicated, flat washers; Alloy [Group 1.
- E. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563; and, where indicated, flat washers.
 - 1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.
- F. Eyebolts: ASTM A 489.

- G. Machine Screws: ASME B18.6.3.
- H. Plain Washers: Round, ASME B18.22.1.
- I. Lock Washers: Helical, spring type, ASME B18.21.1.
- J. Anchors, General: Capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified independent testing agency.
- K. Cast-in-Place Anchors in Concrete: Either threaded or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A47/A47M malleable iron or ASTM A27/A27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F2329/F2329M.
- L. Post-Installed Anchors: Torque-controlled expansion anchors.
 - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.
 - 2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless steel bolts, ASTM F593, and nuts, ASTM F594.
- M. Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4, 1-5/8 by 7/8 inches by length indicated with anchor straps or studs not less than 3 inches long at not more than 8 inches o.c. Provide with temporary filler and tee-head bolts, complete with washers and nuts, all zinc-plated to comply with ASTM B633, Class Fe/Zn 5, as needed for fastening to inserts.

2.4 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Shop Primers: Provide primers that comply with Section 09 96 00 "High-Performance Coatings."
- C. Water-Based Primer: Emulsion type, anticorrosive primer for mildly corrosive environments that is resistant to flash rusting when applied to cleaned steel, complying with MPI#107 and compatible with topcoat.
- D. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.
- E. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- F. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.
- G. Shrinkage-Resistant Grout: Factory-packaged, nonmetallic, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

- H. Concrete: Comply with requirements in Section 03 30 00 "Cast-in-Place Concrete" for normal-weight, air-entrained concrete with a minimum 28-day compressive strength of 3000 psi.

2.5 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. 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.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with 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 no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated, coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
 - 1. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
 - 1. Fabricate units from slotted channel framing where indicated.
 - 2. Furnish inserts for units installed after concrete is placed.
- C. Galvanize miscellaneous framing and supports where indicated.
- D. Prime miscellaneous framing and supports with primer specified in Section 09 96 00 "High-Performance Coatings" where indicated.

2.7 COUNTERTOP BRACKETS

- A. Countertop Support Brackets: Refer to Section 105910 "Aluminum Counter Support Brackets".
- B. Fabricate shelf angles from steel angles of sizes indicated and for attachment to metal framing. Provide horizontally slotted holes to receive 3/4-inch bolts, spaced not more than 6 inches from ends and 24 inches o.c., unless otherwise indicated.
 - 1. Provide mitered and welded units at corners.
 - 2. Provide open joints in shelf angles at expansion and control joints. Make open joint approximately 2 inches larger than expansion or control joint.
- C. For cavity walls, provide vertical channel brackets to support angles from backup masonry and concrete.
- D. Galvanize and prime shelf angles located in exterior walls.
- E. Prime shelf angles located in exterior walls with primer specified in Section 09 9600 "High-Performance Coatings".
- F. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete.

2.8 METAL PIPE BOLLARDS, CONCRETE FILLED

- A. Fabricate metal bollards from Schedule 40 steel pipe, concrete filled.
 - 1. Size: As shown on Drawings.
- B. Galvanize metal bollards after fabrication.

2.9 SHELF ANGLES

- A. Fabricate shelf angles from steel angles of sizes indicated and for attachment to concrete framing. Provide horizontally slotted holes to receive 3/4-inch bolts, spaced not more than 6 inches from ends and 24 inches o.c., unless otherwise indicated.
 - 1. Provide mitered and welded units at corners.

2. Provide open joints in shelf angles at expansion and control joints. Make open joint approximately 2 inches larger than expansion or control joint.
- B. For cavity walls, provide vertical channel brackets to support angles from backup masonry and concrete.
- C. Galvanize and prime shelf angles located in exterior walls.
- D. Prime shelf angles located in exterior walls with primer specified in Section 09 9600 "High-Performance Coatings".
- E. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete.

2.10 METAL LADDERS

A. General:

1. Comply with ANSI A14.3, except for elevator pit ladders, and OSHA 1910.
2. For elevator pit ladders, comply with ASME A17.1/CSA B44.
3. Exterior ladders shall be hot dip galvanized.

B. Steel Ladders:

1. Dimensions: As shown on Drawings.
2. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
3. Provide nonslip surfaces on top of each rung, either by coating rung with aluminum-oxide granules set in epoxy-resin adhesive or by using a type of manufactured rung filled with aluminum-oxide grout.
4. Provide nonslip surfaces on top of each rung by coating with abrasive material metallically bonded to rung.
5. Source Limitations: Obtain nonslip surfaces from single source from single manufacturer.
6. Provide platforms as required to meet OSHA requirements fabricated from welded or pressure-locked steel bar grating, supported by steel angles. Limit openings in gratings to no more than 1/2 inch in least dimension.
7. Support each ladder at top and bottom and not more than 60 inches o.c. with welded or bolted steel brackets.
8. Hot dip galvanize, shop prime and field paint interior and exterior ladders, including brackets, with products specified in Section 09 96 00 "High-Performance Coatings."
9. At access ladders to roof hatches, provide steel angles for roof hatch opening. Coordinate roof opening supports with top of access ladder and anchorage.
10. Provide minimum 72-inch high, hinged security door with padlock hasp at foot of ladder to prevent unauthorized ladder use.

2.11 FRAMING FOR OVERHEAD COILING DOORS

- ### A. General:
- Provide steel framing for overhead coiling doors fabricated from steel angles and shapes in accordance with the requirements of the grille manufacturer. Plug weld built-up members and continuously weld exposed joints.

2.12 MISCELLANEOUS STEEL TRIM

- A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.
- B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
 - 1. Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.
- C. Galvanize and prime exterior miscellaneous steel trim.
- D. Prime exterior miscellaneous steel trim with primer specified in Section 09 96 00 "High-Performance Coatings."

2.13 ABRASIVE METAL NOSINGS

- A. Cast-Metal Units: Cast **[iron] [aluminum] [bronze (leaded red or semired brass)] [nickel silver (leaded nickel bronze)]**, with an integral-abrasive, as-cast finish consisting of aluminum oxide, silicon carbide, or a combination of both. Fabricate units in lengths necessary to accurately fit openings or conditions.
 - 1. Source Limitations: Obtain units from single source from single manufacturer.
 - 2. **Nosings: Cross-hatched units, 4 inches wide with [1/4-inch] [1-inch] lip, for casting into concrete.**
 - 3. **Nosings: Cross-hatched units, 1-1/2 by 1-1/2 inches, for casting into concrete.**
 - 4. **Treads: Cross-hatched units, full depth of tread with 3/4-by-3/4-inch nosing, for application over bent plate treads or existing stairs.**
 - 5. **Thresholds: Fluted-saddle-type units, 5 inches wide by 1/2 inch high, with tapered edges.**
 - 6. **Thresholds: Fluted-interlocking- (hook-strip-) type units, 5 inches wide by 5/8 inch (16 mm) high, with tapered edge.**
 - 7. **Thresholds: Plain-stepped- (stop-) type units, 5 inches wide by 1/2 inch high, with 1/2-inch step.**
- B. Extruded Units: **[Aluminum] [Bronze]**, with abrasive filler consisting of aluminum oxide, silicon carbide, or a combination of both, in an epoxy-resin binder. Fabricate units in lengths necessary to accurately fit openings or conditions.
 - 1. Source Limitations: Obtain units from single source from single manufacturer.
 - 2. Provide ribbed units, with abrasive filler strips projecting 1/16 inch above aluminum extrusion.
 - 3. Provide solid-abrasive-type units without ribs.
 - 4. Nosings:
 - a. Square-back units, **[1-7/8 inches (48 mm)] [3 inches (75 mm)] [4 inches (100 mm)]** wide, for casting into concrete steps.
 - b. Beveled-back units, **[3 inches (75 mm)] [4 inches (100 mm)]** wide with 1-3/8-inch (35-mm) lip, for surface mounting on existing stairs.
 - c. Two-piece units, 3 inches (75 mm) wide, with subchannel for casting into concrete steps.

5. Treads: **[Square] [Beveled]**-back units, full depth of tread with 1-3/8-inch (35-mm) lip, for application over existing stairs.
- C. Provide anchors for embedding units in concrete, either integral or applied to units, as standard with manufacturer.
- D. Drill for mechanical anchors and countersink. Locate holes not more than 4 inches (100 mm) from ends and not more than 12 inches (300 mm) o.c., evenly spaced between ends, unless otherwise indicated. Provide closer spacing if recommended by manufacturer.
 1. Provide two rows of holes for units more than 5 inches (125 mm) wide, with two holes aligned at ends and intermediate holes staggered.
- E. Apply bituminous paint to concealed surfaces of cast-metal units.
- F. Apply clear lacquer to concealed surfaces of extruded units.

2.14 STEEL WELD PLATES AND ANGLES

- A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.15 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish metal fabrications after assembly. All exterior metal fabrications shall be galvanized.
- C. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.
- D. Dissimilar Materials: Separate dissimilar metals with coating of dielectric separator. Do not extend coating onto exposed or finished surfaces.

2.16 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.
 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
- B. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 1. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 2. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."

3. Items Indicated to Receive Primers Specified in Section 09 9600 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 4. Other Steel Items: SSPC-SP 3, "Power Tool Cleaning."
 5. Galvanized-Steel Items: SSPC-SP 16, "Brush-off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals."
- C. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

2.17 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, Class I, AA-M12C22A41.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. 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 surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
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 no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals.
- G. Anchor supports for ceiling hung toilet partitions, operable partitions, overhead doors securely to, and rigidly brace from, building structure.

- H. Anchor shelf angles securely to existing construction with expansion anchors, anchor bolts, or through bolts.
- I. Support steel girders on solid grouted masonry, concrete, or steel pipe columns. Secure girders with anchor bolts embedded in grouted masonry or concrete or with bolts through top plates of pipe columns.
 - 1. Where grout space under bearing plates is indicated for girders supported on concrete or masonry, install as specified in "Installing Bearing and Leveling Plates" Article.
- J. Metal Screens: Install straight and true and in accordance with manufacturer's recommendations.
- K. Overhead Coiling Doors and Grilles: Anchor supports for overhead coiling doors and grilles securely to, and rigidly brace from, building structure.
- L. Ladders: Install in accordance with manufacturer's instructions and in proper relationship with adjacent construction. Secure vertical ladders to concrete with a minimum of two 1/2-inch diameter expansion bolts at each bracket, unless additional attachments are required to sustain imposed loads.

3.2 INSTALLATION OF NOSINGS

- A. Center nosings on tread widths unless otherwise indicated.
- B. For nosings embedded in concrete steps or curbs, align nosings flush with riser faces and level with tread surfaces.
- C. Seal thresholds exposed to exterior with elastomeric sealant complying with Section 07 92 00 "Joint Sealants" to provide a watertight installation.

3.3 INSTALLATION OF BEARING AND LEVELING PLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of plates.
- B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with shrinkage-resistant grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.4 ADJUSTING AND CLEANING

- A. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 09 91 00 "Painting and Coating".
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

3.5 REPAIRS

A. Touchup Painting:

1. Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - a. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
2. Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 09 9600 " High Performance Coating."

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780.

3.6 INSTALLATION OF MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

END OF SECTION

SECTION 05 51 00

METAL PAN STAIRS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Preassembled steel stairs with precast concrete treads.
- 2. Steel tube handrails attached to walls or guardrails adjacent to metal stairs.

B. Related Sections:

- 1. Section 05 50 00 "Metal Fabrications" for stair nosings.
- 2. Section 05 52 13 "Pipe and Tube Railings" for additional railing requirements.
- 3. Section 09 22 16 "Non-Structural Metal Framing" for metal backing for anchoring railings.
- 4. Section 09 91 00 "Painting and Coating".

1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorages for metal stairs, railings, and guards.
 - 1. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, blocking for attachment of wall-mounted handrails, and items with integral anchors, that are to be embedded in concrete or masonry.
 - 2. Deliver such items to Project site in time for installation.
- C. Coordinate locations of hanger rods and struts with other work so they do not encroach on required stair width and are within fire-resistance-rated stair enclosure.
- D. Schedule installation of railings and guards so wall attachments are made only to completed walls.
 - 1. Do not support railings and guards temporarily by any means that do not satisfy structural performance requirements.

1.4 ACTION SUBMITTALS

- A. Product Data: For metal stairs and the following:
 - 1. Precast concrete treads.
 - 2. Paint products.
 - 3. Grout.

B. Shop Drawings:

1. Include plans, elevations, sections, details, and attachments to other work.
2. Indicate sizes of metal sections, thickness of metals, profiles, holes, and field joints.
3. Include plan at each level.
4. Indicate locations of anchors, weld plates, and blocking for attachment of wall-mounted handrails.

1.5 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.
- B. Welding Qualifications: Qualify procedures and personnel according to the following:
1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification.
1. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers.
 2. Protect steel members and packaged materials from corrosion and deterioration.
 3. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures.
 - a. Repair or replace damaged materials or structures as directed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.
1. Uniform Load: 100 lbf/sq. ft.
 2. Concentrated Load: 300 lbf applied on an area of 4 sq. in.
 3. Uniform and concentrated loads need not be assumed to act concurrently.
 4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
 5. Limit deflection of treads, platforms, and framing members to L/240 or 1/4 inch, whichever is less.

- B. Structural Performance of Railings and Guards: Railings and guards, including attachment to building construction, withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
1. Handrails and Top Rails of Guards:
 - a. Uniform load of 50 lbf/ft. applied in any direction.
 - b. Concentrated load of 200 lbf applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 2. Infill of Guards:
 - a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft.
 - b. Infill load and other loads need not be assumed to act concurrently.
 3. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - a. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
- C. Seismic Performance of Stairs: Metal stairs withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. Component Importance Factor: 1.5.

2.2 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.3 FERROUS METALS

- A. Steel Plates, Shapes, and Bars: ASTM A36.
- B. Steel Tubing: ASTM A 500 (cold formed) or ASTM A513.
- C. Rolled-Steel Floor Plate: ASTM A786, rolled from plate complying with ASTM A36 or ASTM A283, Grade C or D.
- D. Uncoated, Cold-Rolled Steel Sheet: ASTM A1008, either commercial steel, Type B, or structural steel, Grade 25, unless another grade is required by design loads; exposed.

2.4 FASTENERS

- A. General: Provide zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5 where built into exterior walls. Select fasteners for type, grade, and class required.
- B. Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and, where indicated, flat washers.
- C. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.

- D. Expansion Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E488, conducted by a qualified independent testing agency.
 - 1. Material for Anchors in Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B633, Class Fe/Zn 5.
 - 2. Approved expansion bolts:
 - a. Simpson Strong Tie; Strong-Bolt.
 - b. Hilti Corporation; Kwik Bolt TZ
- E. Machine Screws: ASME B18.6.3.
- F. Lag Screws: ASME B18.2.1.
- G. Plain Washers: Round, ASME B18.22.1.
- H. Lock Washers: Helical, spring type, ASME B18.21.1.

2.5 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Acrylic Primer for Interior Stairs: Benjamin Moore P04 D.T.M. Acrylic Metal Primer, or equal.
- C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.
- D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.6 PRECAST CONCRETE TREADS

- A. Concrete Materials and Properties: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, ready-mixed concrete with a minimum 28-day compressive strength of 5000 psi and a total air content of not less than 4 percent or more than 6 percent.
 - 1. Basis-of-Design Manufacturer: Meridian Precast, Empire Precast, or equal.
 - 2. Product: Size and profile as shown on Drawings; integral visual warning strips with sanded epoxy infill.
 - 3. Factory Finish: Honed, non-slip finish.
- B. Reinforcement: Galvanized, welded-wire reinforcement, 2 by 2 inches by 0.062-inch-diameter steel wire; comply with ASTM A1064/A1064M, except for minimum wire size.

2.7 FABRICATION, GENERAL

- A. Per approved shop drawings and product data. Pans, risers, stringers, platform frames, and support stations: ASTM A572, Grade 50, 14 gauge minimum.
- B. Provide complete stair assemblies, including metal framing, hangers, struts, offset railings, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.
 - 1. Join components by welding unless otherwise indicated.

2. Use connections that maintain structural value of joined pieces.
 3. Fabricate treads and platforms of exterior stairs so finished walking surfaces slope to drain.
- C. Preassembled Stairs: Assemble stairs in shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- D. Cut, drill, and punch metals cleanly and accurately.
1. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.
 2. Remove sharp or rough areas on exposed surfaces.
- E. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- F. Form exposed work with accurate angles and surfaces and straight edges.
- G. Weld connections to comply with 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. Weld exposed corners and seams continuously unless otherwise indicated.
 5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 2 welds: completely sanded joint, some undercutting and pinholes are acceptable.
- H. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible.
1. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts unless otherwise indicated.
 2. Locate joints where least conspicuous.
 3. Provide weep holes where water may accumulate internally.
- 2.8 FABRICATION OF STEEL-FRAMED STAIRS
- A. General: All stairs and guardrails to be 2022 California Building Code, Chapter 11B, and OSHA compliant.
- B. Stair Framing:
1. Fabricate stringers of channels, as required, with closures for exposed ends of channel stringers.
 2. Construct platforms of channel tube headers and miscellaneous framing members as needed to comply with performance requirements indicated.
 3. Weld or bolt stringers to headers; weld or bolt framing members to stringers and headers. If using bolts, fabricate and join so bolts are not exposed on finished surfaces.
 4. Where masonry walls support metal stairs, provide temporary supporting struts designed for erecting steel stair components before installing masonry.

2.9 STAIR RAILINGS

- A. Steel Tube Railings: Fabricate railings to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of tube, post spacings, and anchorage, but not less than that needed to withstand indicated loads.
- B. Welded Connections: Fabricate railings with welded connections. Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
 - 1. Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 2 welds: completely sanded joint, some undercutting and pinholes are okay.
- C. Form changes in direction of railings as follows:
 - 1. By bending or by inserting prefabricated elbow fittings.
- D. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- E. Close exposed ends of railing members with prefabricated end fittings.
- F. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is $\frac{1}{4}$ inch or less.
- G. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work. Furnish inserts and other anchorage devices for connecting to concrete or masonry work.
 - 1. Connect posts to stair framing by direct welding unless otherwise indicated.
 - 2. For nongalvanized railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves.
- H. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thicknesses and to produce adequate bearing area to prevent bracket rotation and overstressing of substrate.

2.10 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Prime metal stairs in shop after assembly.
- C. 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 products:
 - 1. Interior Stairs (SSPC Zone 1A): SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 2. Interior Stairs: SSPC-SP 3, "Machine Tool Cleaning."
- D. Apply shop primer to uncoated surfaces of metal stair components, except those to be embedded in concrete or masonry unless otherwise indicated. Comply with SSPC-PA 1, "Paint

Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces and conditions receiving or affecting the work.
- B. Verify dimensions and location of preset anchorage.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.
- C. 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.
- D. Field Welding: Comply with requirements for welding in "Fabrication, General" Article.

3.3 ERECTION

- A. General: Erect stair work to line, plumb, square, and true with runs registering level with floor and platform levels.
- B. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction. Include threaded fasteners for concrete inserts, through-bolts, lag bolts, and other connectors.
- C. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.
- D. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete, unless otherwise indicated.
- E. Provide temporary bracing or anchors in formwork for items, which are to be built into concrete or similar construction.
- F. Fit exposed connections accurately together to form tight hairline joints. Weld connections, which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind joints smooth and touch up shop paint coat.
- G. Field Welding: Comply with AWS Code for the procedures of manual shielded metal-arc welding, the appearance and quality of welds made, and the methods used in correcting welding work.

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 no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

3.4 INSTALLING RAILINGS

- A. Refer to Section 05 52 13 for additional installation requirements.
- B. Adjust railing systems before anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated or, if not indicated, as required by design loads. Plumb posts in each direction. Secure posts and rail ends to building construction as follows:
 1. Anchor posts to steel by welding directly to steel supporting members.
 2. Anchor handrail ends to concrete and masonry with steel round flanges welded to rail ends and anchored with postinstalled anchors and bolts.
- C. Attach handrails to wall with wall brackets. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt. Provide bracket with minimum 1-1/2-inch clearance from inside face of handrail to finished wall surface and as required to provide continuously straight railing at each single run of stair or ramp unless otherwise indicated on Drawings. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads. Secure wall brackets to building construction as required to comply with performance requirements.

3.5 PAINTING, ADJUSTING, AND CLEANING

- A. Touch-Up Painting:
 1. Immediately after erection, clean field welds, bolted connections, and abraded areas of the shop paint, and paint all exposed areas with the same material as used for shop painting.
 2. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
- B. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Paint entire assembly in accordance with Section 09 91 00 "Painting."

END OF SECTION

SECTION 05 52 13

PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Steel railings.

- B. Related Requirements:

- 1. Section 05 51 00 "Metal Pan Stairs" for railings associated with metal pan stairs.
 - 2. Section 09 96 00 "High Performance Coatings".

1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- C. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

1.4 ACTION SUBMITTALS

- A. Product Data: Indicate product description for specified coating system and instructions for preparation of surfaces of mechanically connected railings, infill panels, grout, paint, and accessories to receive coatings, rates and methods of applications and finishes to be expected in finished work. Include product data for the following:

- 1. Manufacturer's product lines of mechanically connected railings.
 - 2. Fasteners.
 - 3. Post-installed anchors.
 - 4. Handrail brackets.
 - 5. Shop primer.

6. Intermediate coats and topcoats.
7. Bituminous paint.
8. Nonshrink, nonmetallic grout.
9. Anchoring cement.
10. Metal finishes.
11. Paint products.

- B. Shop Drawings: Indicate sizes, shapes, configuration, sections, locations, fabrication, and installation details. Indicate fabricated sizes. Indicate that railings meet code requirements for vertical and horizontal loading. Include dimensioned plan of built-in anchorage devices, materials, finishes and itemization of parts and accessories. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples for Verification: For each type of exposed finish required.
1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters, including finish.
 2. Fittings and brackets.
 3. Assembled Sample of railing system, made from full-size components, including top rail, post, handrail, and infill. Sample need not be full height.
 - a. Show method of connecting and finishing members at intersections.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Welding certificates: Submit welders' qualifications in accord with AWS D1.1, current within the previous 6 months, for Architect's information only.
- C. Mill Certificates: Signed by manufacturers of stainless steel products, certifying that products furnished comply with requirements.
- D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- E. Product Test Reports: For tests on railings performed by a qualified testing agency, in accordance with ASTM E894 and ASTM E935.
- F. Research Reports: For post-installed anchors, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.6 QUALITY ASSURANCE

- A. Fabricator/Installer Qualifications: A firm experienced in producing handrails and railings similar to those indicated for this Project for a minimum of 5 years, with a record of successful in-service performance, with sufficient production capacity to produce required units without causing delay in the work.
1. Employ only experienced tradesmen for both fabrication and installation, who are capable of producing work of the highest standards of quality in the industry.

- B. 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 handrails and railings that are similar to those indicated for this Project in material, design, and extent.
- C. Allowable tolerances:
1. Machine field and shop assembled mechanical joints shall fit within $\pm 1/32$ ".
 2. Sizes of each element of an assembly shall be correct within $1/8$ "; total size of a freestanding assembly shall be correct within $1/2$ ".
 3. Install railings plumb and aligned within $1/4$ " in $12'-0$ ", and parallel with adjacent surfaces to within $1/4$ ".
 4. Concrete blockouts and inserts shall be spaced within $\pm 3/8$ ", aligned within $\pm 1/4$ " and plumbed within $\pm 1/8$ ".
- D. Applicable standards:
1. American Institute of Steel Construction (AISC), "Specification for Structural Steel Buildings", current edition.
 2. American Iron and Steel Institute (AISI), standards as referenced herein.
 3. American Welding Society (AWS).
 - a. AWS D1.1, "Structural Welding Code -- Steel."
 - b. AWS B2.1, "Welding Procedure and Performance Qualification."
 4. ASTM International (ASTM), standards as referenced herein.
 5. Society for Protective Coatings (SSPC), standards as referenced herein.
- E. Qualifications of welders:
1. Welders employed on the work shall have passed qualification tests and shall be current within the past 6 months in the position for which employed, in accord with AWS D1.1 procedures.
 2. Contractor shall require any welder to retake the qualification test when, in Architect's opinion, welder's work creates a reasonable doubt as to the welder's proficiency. Requalification tests shall be conducted at no additional expense to Owner. Recertification shall be made to Architect after welder has passed the retest.
- F. Field measurements: Take field measurements prior to preparation of shop drawings and fabrication, to ensure fitting of work.
- G. Mockup:
1. General:
 - a. Use the same installation methods and materials as required for the Work.
 - b. Schedule construction so that it may be reviewed, and any necessary adjustments made, prior to commencing fabrication of the Work.
 - c. When accepted, mock-up shall serve as the standard for materials, workmanship, and appearance throughout the Project.
 - d. Construction shall proceed only after acceptance of the on-site visual mockup.
- H. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Transport, deliver and store railings with expanded polystyrene pads or dunnage between prefinished units to prevent marring and chipping.
- B. Handle prefinished units in shop and at jobsite using fabric or other non-abrasive slings; use no metal or abrasive slings.
- C. Protect mechanical finishes on exposed surfaces of railings from damage by applying a strippable, temporary protective covering before shipping.

1.8 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Component Importance Factor: 1.5.
 - 2. Handrails and Top Rails of Guards:
 - a. Uniform load of 50 lbf/ ft. applied in any direction.
 - b. Concentrated load of 200 lbf applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 - 3. Infill of Guards:
 - a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft.
 - b. Infill load and other loads need not be assumed to act concurrently.
 - 4. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - a. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
- B. Deflection Criteria: The larger deflections at the top from either the horizontal live loads or applicable wind loads shall be the lesser of 3/4-inch or $h/90$ for cantilever elements, and $h/175$ for simple span elements, where h is the distance from the floor level to the top of guardrail. Applied loads shall be allowable stress design loads.
- C. Railings and guardrails shall comply with ADA requirements.

2.2 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

- B. Materials shall be free from defects impairing strength, durability or appearance. Exposed surfaces throughout project shall have the same inherent texture and color for like locations.
- C. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.
 - 1. Provide type of bracket with flange tapped for concealed anchorage to threaded hanger bolt and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.

2.3 STEEL RAILINGS

- A. Tubing: ASTM A500/A500M (cold formed).
- B. Pipe: ASTM A53/A53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads. Provide galvanized finish for exterior installations and where indicated.
- C. Plates, Shapes, and Bars: ASTM A36/A36M.
- D. Steel stringer anchors: Manufacturer's standard weld-on type anchor flange or insert.
- E. Handrail wall brackets: Malleable cast iron with wall plate drilled to receive two bolts.

2.4 FASTENERS

- A. Fastener Materials:
 - 1. Ungalvanized-Steel Railing Components: Plated steel fasteners complying with ASTM B633 or F1941, Class Fe/Zn 5 for zinc coating.
 - 2. Hot-Dip Galvanized Railing Components: Type 304 stainless steel or hot-dip zinc-coated steel fasteners complying with ASTM A153/A153M or ASTM F2329/F2329M for zinc coating.
 - 3. Finish exposed fasteners to match appearance, including color and texture, of railings.
- B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction and capable of withstanding design loads.
- C. Fasteners for Interconnecting Railing Components:
 - 1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.
 - 2. Provide tamper-resistant flat-head machine screws for exposed fasteners unless otherwise indicated.
- D. Post-Installed Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193[or **ICC-ES AC308**].

1. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.
2. Exposed fasteners shall be of same materials, color and finish as material to which applied, shall be countersunk and finished flush.

2.5 MISCELLANEOUS MATERIALS

- A. Handrail Brackets: Material to match guardrail; dimensions as shown on Drawings.
- B. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for metal alloy welded.
 1. For stainless steel railings, provide type and alloy as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.
- C. Etching Cleaner for Galvanized Metal: Complying with MPI#25.
- D. Galvanizing Repair Paint: High-zinc-dust-content paint, complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- E. Shop Primers: Provide Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with performance requirements in FS TT-P-664; selected for good resistance to normal atmospheric corrosion, compatibility with finish paint systems indicated, and capability to provide a sound foundation for field-applied topcoats despite prolonged exposure.
- F. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- G. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.
- H. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.
- I. Intermediate Coats and Topcoats: Provide products that comply with Sections 09 9100 "Painting and Coating" and 09 96 00 "High-Performance Coatings".
- J. Bituminous Paint: Cold-applied asphalt emulsion, complying with ASTM D1187/D1187M.
- K. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout, complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- L. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.
 1. Water-Resistant Product: At exterior locations, provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.6 FABRICATION

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
 - 1. Railing dimensions: 1-1/4 inches outside diameter.
- B. Fabricate steel railings in accord with approved shop drawings using mitered and welded joints and radius bends and returns as indicated on the drawings and approved shop drawings. Miter and cope intersections of posts and rails.
- C. Shop-assemble railings to greatest extent possible, up to 20'-0" long in one length, to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations.
 - 1. Clearly mark units for reassembly and coordinated installation.
 - 2. Use connections that maintain structural value of joined pieces.
- D. Cut, drill, and punch metals cleanly and accurately.
 - 1. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.
 - 2. Remove sharp or rough areas on exposed surfaces.
- E. Form work true to line and level with accurate angles and surfaces.
- F. Fabricate connections that are exposed to weather in a manner that excludes water.
 - 1. Provide weep holes where water may accumulate.
 - 2. Locate weep holes in inconspicuous locations.
- G. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- H. Connections: Fabricate railings with welded connections unless otherwise indicated.
- I. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
 - 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 flux immediately.
 - 4. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #1 welds; ornamental quality with no evidence of a welded joint.
- J. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
 - 1. Fabricate splice joints for field connection, using an epoxy structural adhesive, if this is manufacturer's standard splicing method.

- K. Form changes in direction as follows:
 - 1. As detailed on Drawings.
- L. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, grain separation, distortion of surface, or otherwise deforming exposed surfaces of components.
- M. Close exposed ends of hollow railing members with prefabricated cap and end fittings of same metal and finish as railings.
- N. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less. Close wall return ends using welded steel caps and grind smooth.
- O. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.
 - 1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.
- P. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work.
 - 1. Fabricate anchorage devices capable of withstanding loads imposed by railings.
 - 2. Coordinate anchorage devices with supporting structure.
- Q. For railing posts set in concrete, provide stainless steel sleeves not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, with metal plate forming bottom closure.
- R. Toe Boards: Where indicated, provide toe boards at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details indicated.

2.7 STEEL AND IRON FINISHES

- A. Galvanized Railings: Hot-dip galvanize steel railings, including hardware, after fabrication.
 - 1. Hot-dip galvanize exterior steel railings, including hardware, after fabrication.
 - 2. Comply with ASTM A123/A123M for hot-dip galvanized railings.
 - 3. Comply with ASTM A153/A153M for hot-dip galvanized hardware.
 - 4. Do not quench or apply post-galvanizing treatments that might interfere with paint adhesion.
 - 5. Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.
- B. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.

- C. Preparing Galvanized Railings for Shop Priming: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner and as follows.
 - 1. Comply with SSPC-SP 16.
- D. For nongalvanized-steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves; however, hot-dip galvanize anchors to be embedded in exterior concrete or masonry.
- E. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with requirements indicated below:
 - 1. Railings Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3.
 - 2. Railings Indicated to Receive Primers Specified in Section 09 9600 "High-Performance Coatings": SSPC-SP 6/NACE No. 3.
 - 3. Other Railings: SSPC-SP 3.
- F. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1 for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.
- G. **High-Performance Coating:** Apply epoxy intermediate and polyurethane topcoats to prime-coated surfaces. Comply with coating manufacturer's written instructions and with requirements in SSPC-PA 1 for shop painting. Apply at spreading rates recommended by coating manufacturer.
- H. **Powder Coat:** Bonderized for paint adhesion and painted with manufacturer's standard rust-inhibitive primer followed by a powder coat finish of the color selected by the Architect from the manufacturer's palette.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements are clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

- A. Perform cutting, drilling, and fitting required for installing railings.
 - 1. Fit exposed connections together to form tight, hairline joints.
 - 2. Install railings level, plumb, square, true to line; without distortion, warp, or rack.
 - 3. Set railings accurately in location, alignment, and elevation; measured from established lines and levels.
 - 4. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
 - 5. Set posts plumb within a tolerance of 1/16 inch in 3 feet .

6. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
- C. Adjust railings before anchoring to ensure matching alignment at abutting joints.
- D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 RAILING CONNECTIONS

- A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings. Seal recessed holes of exposed locking screws, using plastic cement filler colored to match finish of railings.
- B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article, whether welding is performed in the shop or in the field.
- C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve, extending 2 inches beyond joint on either side; fasten internal sleeve securely to one side; and locate joint within 6 inches of post.

3.4 ANCHORING POSTS

- A. Use stainless steel pipe sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.
- B. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.
- C. Cover anchorage joint with flange of same metal as post, welded to post after placing anchoring material.
- D. Leave anchorage joint exposed with 1/8-inch anchoring material flush with adjacent surface.
- E. Anchor posts to metal surfaces with flanges, angle type, or floor type, as required by conditions, connected to posts and to metal supporting members as follows:
 1. For steel railings, weld flanges to post and bolt to metal supporting surfaces.
 2. For stainless steel railings, weld flanges to post and bolt to supporting surfaces.
- F. Install removable railing sections, where indicated, in slip-fit stainless steel sockets cast in concrete.

3.5 ATTACHING RAILINGS

- A. Anchor railing ends to concrete and masonry with railing ends and anchored to wall construction with anchors and bolts.
- B. Attach railings to wall with wall brackets, except where end flanges are used. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
- C. Attach handrails to walls with wall brackets. Provide brackets with 1-1/2-inch clearance from inside face of handrail and finished wall surface.
 - 1. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.
 - 2. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
- D. Secure wall brackets and railing end flanges to building construction as shown on Drawings.

3.6 REPAIR

- A. Touchup Painting:
 - 1. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - a. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
- B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 09 96 00 "High-Performance Coatings".

3.7 CLEANING

- A. Clean metal by washing thoroughly with clean water and soap and rinsing with clean water.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A780.

3.8 PROTECTION

- A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.
- B. Restore finishes damaged during installation and construction period, so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit or provide new units.

END OF SECTION

SECTION 06 10 53

MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
1. Wood blocking, cants, and nailers.
 2. Wood furring and grounds.
 3. Plywood backing panels.
 4. Plywood paneling at interior.
- B. Related Requirements:
1. Section 09 91 00 "Painting and Coating" for field painting of plywood backerboards.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details. Include wood-preservative and fire-retardant treatment data.
1. Include physical properties of treated materials based on testing by a qualified independent testing agency.
 2. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
 3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.4 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For the following, from ICC-ES:
1. Fire-retardant-treated wood.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Stack wood flat with spacers beneath and between each bundle to provide air circulation. Protect wood from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
- C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.
- D. Application: Treat all rough carpentry unless otherwise indicated.
 - 1. Plywood backing panels.

2.4 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction.
- B. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- C. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- D. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.
- E. For items of dimension lumber size, provide Construction or No. 2 grade lumber:
 - 1. Spruce-pine-fir; NLGA.
 - 2. Western woods; WCLIB or WWPA.

2.5 PLYWOOD PANELS

- A. Equipment Backing and Interior Exposed Panels: Plywood, DOC PS 1, Exterior, A-C in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness. Panels shall not contain added urea-formaldehyde.
 - 1. Panels shall be pre-painted, color: white.
 - 2. Dimensions: As shown on Drawings.

2.6 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. Use stainless steel where exposed to weather, in ground contact, in contact with treated wood, or in area of high relative humidity
- B. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- C. Lag Bolts: ASME B18.2.1.
- D. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.
- E. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.
- C. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

END OF SECTION

SECTION 06 16 00

SHEATHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Wall sheathing.
- 2. Roof sheathing.
- 3. Sheathing joint and penetration treatment.

B. Related Requirements:

- 1. Section 06 10 53 "Miscellaneous Rough Carpentry" for plywood backing panels.
- 2. ACTION SUBMITTALS Section 07 25 00 "Weather Barriers" for water-resistive barrier applied over wall sheathing.

1.3

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Include physical properties of treated materials.
 - 2. For fire-retardant treatments, include physical properties of treated plywood both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D5516.
 - 3. For products receiving waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
- B. Shop Drawings: For air-barrier and water-resistant glass-mat gypsum sheathing assemblies.
- C. Test Reports: Submit alternative/equivalent UL test data, if sheathing is substituted and does not match assemblies listed in the Wall Schedule found on the Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For the following, from ICC-ES:
 - 1. Wood-preservative-treated plywood.
 - 2. Fire-retardant-treated plywood.
- B. Qualification Data: For Installer.
- C. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Mockups: Build mockups to set quality standards for materials and execution and for preconstruction testing.
- B. Testing Agency Qualifications:
 - 1. For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

1.7 QUALITY ASSURANCE

- A. Mockups: Build mockups to set quality standards for materials and execution and for preconstruction testing.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance Ratings: As tested according to ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- B. Air-Barrier and Water-Resistant Glass-Mat Gypsum Sheathing Performance: Air-barrier and water-resistant glass-mat gypsum sheathing assembly, and seals with adjacent construction, shall be capable of performing as a continuous air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate

expansion and control joints, construction material changes, penetrations, tie-ins to installed waterproofing, tie-ins to other installed air barriers, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

2.2 WALL SHEATHING

A. Mat-Faced Gypsum Sheathing:

1. Typical Vertical Finish Board: ASTM C1177, Type X, Securock as manufactured by USG; GlasRoc as manufactured by CertainTeed; Gold Bond "eXP" Sheathing by National Gypsum Company; or equal.
 - a. Size: 48 inches by maximum available length to minimize joints. provide metal stud framing or backing as shown at all panel edges.
2. Fasteners: Steel drill screws, in length recommended by Mat-Faced Gypsum Sheathing manufacturer, but no less than 1 inch penetration into steel framing. ASTM C954 or ASTM C1002 self-drilling and self-tapping corrosion-resistant screws; minimum No. 6 x 1-1/2 inches at 8-inches on center maximum spacing at perimeter and intermediate framing member and backing.

2.3 ROOF SHEATHING

A. Glass-Mat Roof Sheathing:

1. Typical Horizontal or Sloped Finish Board: ASTM E119, Type X, Securock as manufactured by USG or equal.
 - a. Note: Glass-Mat Roof Sheathing provided by the manufacturer of the selected roof system(s) shall be considered equal.
2. Vertical Applications: ASTM E119, Type X, Dens-Deck Prime as manufactured by USG, or equal.
 - a. Provide at parapets as a substrate where the finish is single-ply membrane roofing.
3. Fasteners: Steel drill screws, in length recommended by Glass-Mat-Faced Gypsum Sheathing manufacturer for thickness of sheathing board, but no less than 1 inch penetration in to steel framing, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.
 - a. Provide FMRC0-approved fasteners in accordance with FMRC requirements and roof system manufacturers' written recommendations.

2.4 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

A. Silicone Emulsion Sealant: ASTM C834, compatible with sheathing tape and sheathing, recommended by tape and sheathing manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners. Refer to VOC limits specified in Section 01 10 00 – Sustainable Design Requirements.

1. Sheathing Tape: Self-adhering glass-fiber tape, minimum 2 inches wide, 10 by 10 or 10 by 20-threads/inch, of type recommended by sheathing and tape manufacturers for use

with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing and with a history of successful in-service use.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with building code.
 - 1. GA-253, ASTM C 1280 and manufacturer's recommendations.
- D. Use common wire nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.
- E. Coordinate wall, parapet, and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
- G. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 GYPSUM SHEATHING INSTALLATION

- A. Comply with GA-253 and with manufacturer's written instructions.
 - 1. Fasten gypsum sheathing to cold-formed metal framing with screws.
 - 2. Install boards with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
 - 3. Install boards with a 1/4-inch gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.
- B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.
- C. Seal sheathing joints according to sheathing manufacturer's written instructions.
- D. Horizontal Installation: Install sheathing with V-grooved edge down and tongue edge up. Interlock tongue with groove to bring long edges in contact with edges of adjacent panels without forcing. Abut ends over centers of studs, and stagger end joints of adjacent panels not less than one stud spacing. Attach at perimeter and within field of panel to each stud.

1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of panels.
- E. Vertical Installation: Install vertical edges centered over studs. Abut ends and edges with those of adjacent panels. Attach at perimeter and within field of panel to each stud.
1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of panels.
 2. For sheathing under stucco cladding, panels may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.
- F. Seal sheathing joints according to sheathing manufacturer's written instructions.
1. Apply elastomeric sealant to joints and fasteners and trowel flat. Apply sufficient amount of sealant to completely cover joints and fasteners after troweling. Seal other penetrations and openings.
 2. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing joints and apply and trowel sealant to embed entire face of tape in sealant. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.

3.3 FIELD QUALITY CONTROL

- A. ABAA Quality Assurance Program: Perform examinations, preparation, installation, testing, and inspections under ABAA's Quality Assurance Program.
- B. Testing and Inspecting Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- C. Inspections: Air-barrier and water-resistant glass-mat gypsum sheathing, accessories, and installation are subject to inspection for compliance with requirements.

END OF SECTION

SECTION 06 40 23

INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Wood and plastic laminate casework.
 - 2. Wood furring, blocking, shims, and hanging strips for installing interior architectural woodwork items that are not concealed within other construction.
 - 3. Shop priming of interior architectural woodwork.
 - 4. Shop finishing of interior architectural woodwork.
- B. Related Requirements:
 - 1. Section 06 10 53 "Miscellaneous Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing interior architectural woodwork that are concealed within other construction before interior architectural woodwork installation.
 - 2. Section 09 91 00 "Painting and Coating" for opaque coating of MDF.

1.3 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections, to ensure that interior architectural woodwork can be supported and installed as indicated.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

- A. Product Data: For anchors, adhesives, shop finishing materials, and wood preservative treatment.
- B. Shop Drawings:
 - 1. Include the following:
 - a. Dimensioned plans, elevations, and sections.

- b. Attachment details.
 - 2. Show full-size details.
 - 3. Show locations and sizes of furring, blocking, and hanging strips, including blocking and reinforcement concealed by construction and specified in other Sections.
 - 4. Apply WI Certified Compliance Program label to Shop Drawings.
- C. Samples: For each exposed product and for each shop-applied color and finish specified.
 - 1. Size:
 - a. Panel Products: 12 inches by 12 inches.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For the following:
 - 1. Composite wood and agrifiber products.
 - 2. Adhesives.
- C. Evaluation Reports: For preservative-treated and fire-retardant-treated wood materials, from ICC-ES.
- D. Field quality-control reports.

1.7 CLOSEOUT SUBMITTALS

- A. Quality Standard Compliance Certificates: WI Certified Compliance Program certificates.

1.8 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Build mockups of typical interior architectural woodwork as shown on Drawings.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Owner specifically approves such deviations by Change Order.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Comply with the Architectural Woodwork Standards, Section 2.

- B. Do not deliver interior architectural woodwork until painting and similar finish operations that might damage woodwork have been completed in installation areas.
- C. Store woodwork in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.
 - 1. Handle and store fire-retardant-treated wood to comply with chemical treatment manufacturer's written instructions.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install interior architectural woodwork until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels designed for building occupants for the remainder of the construction period.
- B. Environmental Limitations: Do not deliver or install interior architectural woodwork until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 25 and 55 percent during the remainder of the construction period.
- C. Field Measurements: Where interior architectural woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings.
 - 1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being concealed by construction, and indicate measurements on Shop Drawings.
- D. Established Dimensions: Where interior architectural woodwork is indicated to fit to other construction, establish dimensions for areas where woodwork is to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.11 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that architectural woodwork can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 ARCHITECTURAL WOODWORK, GENERAL

- A. Quality Standard: Unless otherwise indicated, comply with the North American Architectural Woodwork Standards for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.
 - 1. Provide labels and certificates from WI certification program indicating that woodwork and installation complies with requirements of grades specified.

2. The Contract Documents contain requirements that are more stringent than the Architectural Woodwork Standards. Comply with Contract Documents and Architectural Woodwork Standards.

2.2 PLASTIC LAMINATE AND CABINET LINER MATERIALS

- A. Manufacturer: Provide plastic laminate products manufactured by Nevamar, Pionite, Laminart or equal, and as required to match the Architect's samples.
 1. Provide Plastic Laminate and Cabinet Liner from the same manufacturer for each application.
- B. Plastic Laminate:
 1. General: Per requirements of NEMA publication LD3 and made from fire-retardant chemicals mixed together at time of manufacture to achieve flame-spread index of 25 or less and smoke-developed index of 25 or less per ASTM E84.
 2. Plastic Laminate Horizontal Surfaces, Shelf Tops and Bottoms: Grade HGS, 0.048-inch-thick nominal.
 - a. Edges of Plastic Laminate Shelves: PVC tape, matching laminate in color, pattern, and finish
 - b. Banded Edges: 3mm (1/8") thick banding at exposed edges (doors, drawer fronts, leg panels, aprons, valances, open cabinet parts) and thin band (0.020") at all other banded edges.
 3. Vertical Surfaces: Grade VGS, minimum 0.028-inch-thick.
 4. Types: As shown and scheduled on the Drawings.
- C. Cabinet Liner:
 1. General: High-Pressure Plastic Laminate, per requirements of NEMA publication LD3.
 2. Cabinet Liner: Minimum 0.020-inch-thick plastic laminate.
 3. Types: As shown and scheduled on the Drawings.

2.3 WOOD SUBSTRATE MATERIALS

- A. General Requirements:
 1. Material Grades: Provide AWS Premium grade unless otherwise noted.
 2. Lumber and plywood shall be kiln-dried to equilibrium moisture content suitable for fabrication in shop and for use intended.
 3. Use only material that is free of urea-formaldehyde.
- B. Concealed or Semi-Concealed Lumber: Finish exposed edges to match adjacent veneer or black paint as shown on drawings.
 1. Softwood: Poplar, custom grade.
- C. Medium-Density Fiberboard: ANSI A208.2, Grade MD, made with binder containing no urea formaldehyde. "Meditate" by SierraPine Ltd.; Medite Div; or equal.
- D. Softwood Plywood: DOC PS 1, Medium Density Overlay samples and showing compliance with Materials Red List as specified.
 1. Adhesive: Exterior waterproof type.
 2. Finish: Opaque paint finish at semi-concealed faces.
- E. Fire-Retardant Fiberboard: Medium-density fiberboard panels complying with ANSI A208.2, made from softwood fibers, synthetic resins, and fire-retardant chemicals mixed together at time

of panel manufacture to achieve flame-spread index of 25 or less and smoke-developed index of 200 or less per ASTM E 84.

1. Product: Subject to compliance with requirements, provide "Meditate FR" by SierraPine Ltd.; Mediate Div., or equal.

2.4 HARDWARE AND ACCESORIES

A. General Requirements:

1. Furnish necessary screws, bolts, or other fastening of proper size and type to secure item in position and, where exposed, to match finish of hardware item fastened.
2. Refer to Drawings for further information.

B. Basis-of-Design Products:

1. Trash and Recycle Pull-Out Bins: Knape & Vogt, "USC18-2-50PT", two bins, capacity: 50qt., finish: platinum.
2. Cabinet Drawer Slides: Knape & Vogt, Light Duty Drawer Slide: MuV 34; full extension, soft close; roller bearings; under drawer mount.
 - a. Pound Class 75.
 - b. Height: 1-7/8 inches.
 - c. Model MuV for drawer material 5/8 inch to 3/4 inch thick.
 - d. Finish: Zinc.

2.5 FABRICATION

A. Plastic Laminate Casework:

1. Applicable Standard: AWS Section 10 – Casework – Laminated Plastic.
2. Grade: AWS Custom unless otherwise noted.
3. Construction Style: Flush overlay.
4. Scribing: Flush with door faces and per Premium Grade regardless of specified casework grade.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition interior architectural woodwork to humidity conditions in installation areas for not less than 72 hours prior to beginning of installation.
- B. Before installing interior architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming of concealed surfaces.

3.2 INSTALLATION

- A. Grade: Install interior architectural woodwork to comply with same grade as item to be installed.

- B. Assemble interior architectural woodwork and complete fabrication at Project site to the extent that it was not completed during shop fabrication.
- C. Install interior architectural woodwork level, plumb, true in line, and without distortion.
 - 1. For flush paneling with revealed joints, install with variations in reveal width, alignment of top and bottom edges, and flushness between adjacent panels.
- D. Anchor paneling to supporting substrate.
 - 1. Shim as required with concealed shims.
- E. Install level and plumb to a tolerance of 1/8 inch in 96 inches.

3.3 FIELD QUALITY CONTROL

- A. Inspections: Provide inspection of installed Work through WI's Certified Compliance Program certifying that woodwork, including installation, complies with requirements of the Architectural Woodwork Standards for the specified grade.
 - 1. Inspection entity shall prepare and submit report of inspection.

3.4 REPAIR

- A. Repair damaged and defective interior architectural woodwork, where possible, to eliminate functional and visual defects and to result in interior architectural woodwork being in compliance with requirements of Architectural Woodwork Standards for the specified grade.
- B. Where not possible to repair, replace defective woodwork.
- C. Shop Finish: Touch up finishing work specified in this Section after installation of interior architectural woodwork.
 - 1. Fill nail holes with matching filler where exposed.
 - 2. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are shop applied.
- D. Field Finish: See Section 09 91 00 " Painting and Coating" for final finishing of installed interior architectural woodwork not indicated to be shop finished.

3.5 CLEANING

- A. Clean interior architectural woodwork on exposed and semiexposed surfaces.

END OF SECTION

SECTION 06 64 00

PLASTIC PANELING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Plastic sheet paneling.
- 2. Factory-laminated plastic sheet paneling.

B. Related Requirements:

- 1. Section 06 10 53 "Miscellaneous Rough Carpentry" for wood furring for installing plastic paneling.
- 2. Section 07 92 00 "Joint Sealants."
- 3. Section 10 26 00 "Wall and Door Protection" for corner guards installed over plastic paneling.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Submit sufficient manufacturer's data to indicate compliance with these specifications, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- B. Shop Drawings: Submit elevations of each wall showing location of paneling and trim members with respect to all discontinuities in the wall elevation.
- C. Samples: For plastic paneling and trim accessories, in manufacturer's standard sizes.

1.4 QUALITY ASSURANCE

- A. Testing Agency: Acceptable to authorities having jurisdiction and FM Approvals.
- B. Conform to building code requirements for interior finish for smoke and flame spread requirements as tested in accordance with:
 - 1. ASTM E 84 (Method of test for surface burning characteristics of building Materials)
 - a. Wall Required Rating – Class A.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials factory packaged on strong pallets.
- B. Store panels and trim lying flat, under cover and protected from the elements. Allow panels to acclimate to room temperature (range of 60 to 75°F) for 48 hours prior to installation.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install plastic paneling until spaces are enclosed and weathertight and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.7 WARRANTY

- A. Furnish one-year guarantee against defects in material and workmanship.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain plastic paneling and trim accessories from single manufacturer.

2.2 PLASTIC SHEET PANELING

- A. Glass-Fiber-Reinforced Polyester Panels: Fiberglass reinforced thermosetting polyester resin panel sheet complying with ASTM D5319.
 - 1. Basis-of-Design: Marlite "Marlite Standard Panels" or equal.
 - 2. Surface-Burning Characteristics: As follows when tested by a qualified testing agency according to ASTM E84. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: 200 or less.
 - b. Smoke-Developed Index: 450 or less.
 - 3. Nominal Thickness: Not less than 3/32-inch nominal.
 - 4. Surface Finish: As shown on Drawings.
 - 5. Location: At wet locations, typical.
 - 6. Color: As shown on Drawings.
- B. Engineered PETG rigid sheet. Chemical and stain resistance shall be per ASTM D 543.
 - 1. Basis-of-Design: Construction Specialties "Acrovyn 4000" or equal.

2. Surface-Burning Characteristics: As follows when tested by a qualified testing agency according to ASTM E84. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less.
3. Thickness: Not less than 0.060-inch nominal.
4. Sheet size: 48 by 120 inches.
5. Surface Finish: Suede texture.
6. Location: As shown on Drawings for decorative use.
7. Color and Pattern: As selected by Architect from manufacturer's standard palette.
8. Caulk: Color-match caulk as needed for joints and transitions.

2.3 ACCESSORIES

- A. Trim Accessories: Manufacturer's standard vinyl extrusions designed to retain and cover edges of panels. Provide division bars, inside corners, outside corners, and caps as needed to conceal edges.
 1. Color: To match fiber-reinforced paneling.
- B. Exposed Fasteners: Nylon drive rivets recommended by panel manufacturer.
- C. Adhesive: As recommended by plastic paneling manufacturer.
- D. Sealant: Sealant recommended by plastic paneling manufacturer and complying with requirements in Section 07 92 00 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove wallpaper, vinyl wall covering, loose or soluble paint, and other materials that might interfere with adhesive bond.
- B. Examine backup surfaces to determine that corners are plumb and straight, surfaces are smooth, uniform, clean and free from foreign matter, nails countersunk, joints and cracks filled flush and smooth with the adjoining surface.
- C. Prepare substrate by sanding high spots and filling low spots as needed to provide flat, even surface for panel installation.

- D. Clean substrates of substances that could impair adhesive bond, including oil, grease, dirt, and dust.
- E. Condition panels by unpacking and placing in installation space before installation according to manufacturer's written recommendations.
- F. Lay out paneling before installing. Locate panel joints to provide equal panels at ends of walls not less than half the width of full panels unless otherwise shown on Drawings.
 - 1. Mark plumb lines on substrate at panel joint locations for accurate installation.
 - 2. Locate trim accessories and panel joints to allow clearance at panel edges according to manufacturer's written instructions.

3.3 INSTALLATION

- A. Install plastic paneling according to manufacturer's written instructions.
- B. Install panels in a full spread of adhesive.**
- C. Install panels with fasteners. Layout fastener locations and mark on face of panels so that fasteners are accurately aligned.**
 - 1. Drill oversized fastener holes in panels and center fasteners in holes.**
 - 2. Apply sealant to fastener holes before installing fasteners.**
- D. Install trim accessories with adhesive. Do not fasten through panels.
- E. Fill grooves in trim accessories with sealant before installing panels, and bed inside corner trim in a bead of sealant.
- F. Maintain uniform space between panels and wall fixtures. Fill space with sealant.
- G. Maintain uniform space between adjacent panels and between panels and floors, ceilings, and fixtures. Fill space with sealant.
- H. Remove excess sealant and smears as paneling is installed. Clean with solvent recommended by sealant manufacturer and then wipe with clean dry cloths until no residue remains.

3.4 CLEANING

- A. Remove excess sealant from panels and moldings. Wipe panel down using a damp cloth and mild soap solution or cleaner.
- B. Refer to manufacturer's specific cleaning recommendations Do not use abrasive cleaners.

END OF SECTION

SECTION 07 13 26

SHEET WATERPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes: Horizontal and vertical waterproofing of elevator pit.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review waterproofing requirements including surface preparation, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details and sheet flashings, installation procedures, testing and inspection procedures, and protection and repairs.
 - 2. The following are recommended to attend the pre-construction meeting: Manufacturer, installer, Contractor, third party monitor, Architect/ Owner representative, concrete contractor.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
Include construction details, material descriptions, and tested physical and performance properties of waterproofing.
- B. CALGreen Submittals: Submit product data in accordance with Section 01 81 15 "CALGreen Requirements".
 - 1. Product Data for CALGreen 5.504.4.1 Adhesives, Sealants, Caulks: Product Data and material safety data sheets (MSDS) for adhesives and sealants used on the project, indicating VOC content of each product used.
 - 2. Product Data for Requirement 5.504.4.3: For paints and coatings, documentation indicating products meet Table 5.504.4.3 in the California Building Code, unless more stringent local limits apply.
- C. Shop Drawings: Show locations and extent of waterproofing and details of substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining

waterproofing, and other termination conditions. Show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades. Include the following:

1. Tie back heads.
 2. Grout port/joint layouts.
 3. All other project specific conditions.
- D. Samples: For each exposed product and for each color and texture specified, including the following products:
1. 8-by-8-inchesquare of waterproofing and flashing sheet.
 2. 8-by-8-inch square of insulation.
 3. 4-by-4-inchesquare of drainage panel.
- E. Performance Requirement Certificates: Submit certificate(s) signed by manufacturer certifying materials comply with specified performance characteristics and physical requirements.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Approved Applicator Certificate: Submit written certification that installer has current Approved Applicator status with waterproofing material manufacturer
- B. Field quality-control reports.
- C. Sample Warranties: Submit project specific sample warranty by manufacturer and installer

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer. Submit written certification that installer has current Approved Applicator status with waterproofing material manufacturer
- B. Installer Qualifications: Installer shall meet or exceed the qualifications listed below and indicated elsewhere in the Contract Documents.
 1. A firm which has at least 10 years' experience in work of the type required by this Section, who can comply with manufacturer's warranty requirements.
 2. Installer must have been an authorized applicator of the specified materials for a minimum of 5 years.
 3. Installer shall employ adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section
- C. Mockups: Build mockups to verify selections made under Sample submittals and to set quality standards for installation.
 1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

- D. **Manufacturer Qualifications:** Manufacturer shall meet or exceed the qualifications listed below and indicated elsewhere in the Contract Documents.
 - 1. Sheet membrane waterproofing system shall be manufactured and marketed by a firm with a minimum of 20 years experience in the production and sales of sheet membrane waterproofing.
 - 2. Manufacturer shall be capable of providing field service representation during construction, approving an acceptable installer, recommending appropriate installation methods, and conducting a final inspection of the waterproofing and drainage system applied.
 - 3. Manufacturers proposed for use but not named in these specifications shall submit evidence of ability to meet all requirements specified, and include a list of 20 projects of similar design and complexity completed within the past 5 years.
- E. **Manufacturer's Representative:** Make arrangements necessary to have a trained employee of the manufacturer on-site periodically during membrane waterproofing work to review installation procedures.
- F. **Independent Inspection:** Owner shall make all arrangements and payments for an independent inspection service to monitor waterproofing material installation compliance with the project contract documents and manufacturer's published literature and site specific details. Independent Inspection Firm shall be an approved company participating with the waterproofing manufacturer's Certified Inspection Program.
- G. **Materials:** For each type of material required for the Work of this Section, provide materials which are the products of one manufacturer. For products indicated that are not manufactured by the sheet waterproofing manufacturer, provide products approved by the sheet waterproofing manufacturer.
- H. **Source Limitation:** All materials shall be sourced from or approved by one manufacturer.
- I. **Scheduling:** Schedule work such that membrane will not be left exposed to weather or construction debris for longer than that recommended by the manufacturer but in no case left unprotected for more than 56 days.
- J. **Schedule Coordination:** Schedule work such that membrane will not be left exposed to weather for longer than that recommended by the manufacturer

1.7 FIELD CONDITIONS

- A. **Environmental Limitations:** Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate.
Do not apply waterproofing in snow, rain, fog, or mist.
- B. **Proceed with installation only when substrate construction and preparation work is complete and in condition to receive waterproofing.**

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver the materials to the job site in the manufacturer's unopened containers with all labels intact and legible at time of use.
- B. Store and handle in strict compliance with manufacturer's instructions, recommendations and material safety data sheets.
- C. Maintain the products in a dry condition during delivery, storage, handling, installation, and concealment.
- D. Protect from damage from sunlight, weather, excessive temperatures and construction operations.
- E. Do not double-stack pallets of membrane on the job site. Provide cover on top and at all sides allowing for adequate ventilation.
- F. Protect mastic and adhesives from moisture and potential sources of ignition.
- G. Store drainage composite or protection board flat and off the ground. Provide cover on top and all sides.
- H. Remove damaged material from the site and dispose of in accordance with applicable regulations.
- I. Sequence deliveries to avoid delays, but minimize on-site storage

1.9 WARRANTY

- A. **Manufacturer's Warranty:** Manufacturer's water-tightness warranty in which manufacturer agrees to provide labor and material to replace waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.
Warranty Period: 10-year warranty from date of Substantial Completion.
- B. **Installer's Warranty:** Installer's warranty against all leaks in the waterproofing system in which Installer agrees to repair or replace waterproofing system that does not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. **Warranty Period:** Five years from date of Substantial Completion.
 - a. Warranty shall provide for crack injection repairs for leakage that occurs during the warranty period at no additional cost to the Owner.
 - b. Warranty includes removing and reinstalling drain mat, and other overburden at no additional cost to the Owner.
 - c. Warranty shall state that the waterproofing system shall remain watertight for the entire warranty period and that the contractor will make timely leak repairs upon notification.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Source Limitations for Waterproofing System: Obtain waterproofing materials, protection course, and molded-sheet drainage panels from single source from single manufacturer.
- B. CALGreen Requirements:
 - 1. 5.504.4.1 Adhesives, Sealants, Caulks: Refer to VOC limits found in Section 01 81 15 "CALGreen Requirements."
 - 2. 5.504.4.3 Paints and Coatings: Refer to VOC limits found in Section 01 81 15 "CALGreen Requirements."

2.2 SHEET WATERPROOFING

- A. Bonded HDPE or Polyethylene Sheet for Blindsided Horizontal Applications, and cast-in place locations (at below grade slab): Uniform, flexible, multilayered-composite sheet membrane consisting of either an HDPE film coated with pressure-sensitive adhesive and protective release liner, total 46-mil thickness.
 - 1. Basis of Design Product:
 - a. GCP Applied Technologies "Preprufe 300R Plus" under slab.
- B. Post-applied waterproofing at vertical and for grade terminations/transitions.
 - 1. Basis of Design Product:
 - a. GCP Applied Technologies "Bituthene 4000" as shown on Drawings.

2.3 AUXILIARY MATERIALS

- A. General: Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.
- B. Primer: For post-applied waterproofing.
 - 1. Basis-of-Design Product: GCP Applied Technologies "B2 LVC Primer" over liquid, surface conditioner recommended for substrate by sheet-waterproofing material manufacturer.
- C. Liquid Membrane: Elastomeric, two-component liquid, cold fluid applied, of trowel grade or low viscosity.
 - 1. Basis-of-Design Product: GCP Applied Technologies "Bituthene Liquid Membrane" over liquid, surface conditioner recommended for substrate by sheet-waterproofing material manufacturer.
- D. Metal Termination Bars: Type 316 stainless steel, approximately 1 inch by 1/8 inch thick, predrilled at 6-inch centers.
 - 1. Provide 6-inch wide stainless steel at transition between HRA and below grade.
- E. Protection Course: Asphaltic Board: Asphalt-impregnated mats with asphalt core in accordance with ASTM D 6506.
 - 1. PC-3 Heavy Duty Protection Course, 1/4-inch; WR Meadows.

- F. Tape for covering cold joints, cut edges, roll ends, penetrations and detailing.
 - 1. Preprufe Tape HC: For hot climates, minimum of 50° F.
 - 2. Preprufe Tape LC: For temperatures between 25° F and 86° F.
- G. Protection Board: Cement board approved for exterior below-grade use.
 - 1. Thickness: 1/2-inch.
- H. Fasteners:
 - 1. Drive Pin Fasteners: Stainless steel drive pin fasteners with threaded pins. Subject to compliance with requirements, provide Zamac Hammer Screw by Powers Fasteners or approved equal.
 - 2. Wood Fasteners: Stainless steel screws of sufficient length to penetrate substrate 1-1/4 inches.
 - 3. All other miscellaneous fasteners shall be stainless steel.
- I. Miscellaneous Materials: Tape and accessories specified or acceptable to manufacturer of sheet membrane waterproofing. Provide accessory products indicated in the Contract Documents and as required by the manufacturer for a complete and watertight installation

2.4 INSULATION

- A. Insulation, General: Where insulation is used below grade, comply with Section 07 21 00 "Thermal Insulation."
- B. Board Insulation: Extruded-polystyrene board insulation complying with ASTM C 578, square edged.
 - 1. Basis of Design Product: Subject to compliance with requirements, provide the following:
 - a. Dow Chemical Company (The); closed-cell XPS Dow Blue Board for below grade applications.
 - 2. Type VI, 40-psi minimum compressive strength.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the waterproofing.
 - 1. Verify that concrete has cured and aged for minimum time period recommended in writing by waterproofing manufacturer.
 - 2. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer.
 - 3. Verify that compacted subgrade is dry, smooth, sound, and ready to receive waterproofing sheet.
 - 4. Verify that shoring wall to receive waterproofing is smooth, sound, and per manufacturers requirements.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

- A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.
- B. Substrate:
 - 1. Prepare substrate according to manufacturer's written requirements.
 - 2. Substrate must be clean, smooth and dry.
 - 3. Remove dust, dirt and debris.
 - 4. Do not proceed with installation until concrete has properly cured and dried.
 - 5. Prior to waterproofing, repair voids and lagging out of plane by greater than 1/2 inch.
 - 6. Grind irregular construction joints to suitable flush surface.
 - 7. Prepare joints in accordance with manufacturer's instructions.
 - 8. Ensure no active water running down shoring.
 - 9. Standing water shall not be allowed during construction.
 - 10. Grout around all penetrations, e.g., utility conduits, etc. for stability.
 - 11. Horizontal Surfaces: The substrate must be free of loose aggregate and sharp protrusions. Avoid curved or rounded substrates. When installing over earth or crushed stone, ensure substrate is well compacted to avoid displacement of substrate due to traffic or concrete pour. The surface does not need to be dry, but standing water must be removed.
 - 12. Vertical Surfaces: Use concrete, plywood, insulation or other approved facing to sheet piling to provide support to the membrane. Board systems such as timber lagging must be close butted to provide support and not more than 1/2-inch out of alignment
- C. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.
- D. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- E. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids.
- F. Apply primer to clean surfaces at manufacturer's recommended coverage rate. Do not apply directly to self-adhering sheet membrane.
- G. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks according to ASTM D 4258.
 - 1. Install sheet strips of width according to manufacturer's written instructions and center over treated construction and contraction joints and cracks exceeding a width of 1/16 inch or 1/8 inch for modified bituminous deck-paving waterproofing.
- H. Corners: Prepare, prime, and treat inside and outside corners according to ASTM D 6135.
 - 1. Install membrane strips centered over vertical inside corners. Install 3/4-inch fillets of liquid membrane on horizontal inside corners and as follows:
- I. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through waterproofing and at drains and protrusions according to ASTM D 6135.

3.3 POST-APPLIED WATERPROOFING

- A. Install per manufacturer's requirements and as shown on Drawings. Lap all seams 3 inches and seal with liquid membrane. Prime surfaces to receive waterproofing with primer.
- B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.
- C. Apply primer to clean surfaces at manufacturer's recommended coverage rate. Do not apply directly to self-adhering sheet membrane
- D. Pre-strip all slab and wall cracks over 1/16 inch wide and all construction and control joints with 9 in. wide sheet membrane strip.
- E. Substrate:
 - 1. Do not proceed with installation until concrete has properly cured and dried.
 - 2. Repair bugholes over 1/2-inch in length and 1/4 inch in depth and finish flush with surrounding surface.
 - 3. Remove scaling to sound, unaffected concrete and repair exposed area.
 - 4. Grind irregular construction joints to suitable flush surface.
 - 5. Prepare joints in accordance with manufacturer's instructions.
- F. Corners: Prepare, prime, and treat inside and outside corners according to manufacturer's recommendations.
- G. Install self-adhering waterproofing sheets according to manufacturer's written instructions. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch minimum lap widths and end laps. Overlap and seal seams and stagger end laps a minimum of 9 inches to ensure watertight installation.
 - 1. Roll overlaps using a lap roller to ensure complete adhesion and continuity. Apply firm, consistent pressure to roller.
 - 2. Seal all seams with liquid membrane. At locations with two layers of self-adhering membrane, seal seams of outer layer.
- H. Apply continuous sheets over sheet strips bridging substrate cracks, construction, and contraction joints.
- I. Install sheet waterproofing and auxiliary materials to tie into adjacent waterproofing.
- J. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches beyond repaired areas in all directions.
- K. Correct deficiencies in or remove sheet waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.
- L. Termination Bar:
 - 1. Termination bars shall be cut at all changes in plane. Edges of termination bars shall be ground smooth with file or grinding wheel prior to installation. Provide a gap of 1/8-inch between adjacent termination bar sections

2. Termination bars shall be installed with drive pin fasteners installed at 6-inches on center into pre-drilled holes. First fastener shall be installed within 1-inch of the end of each termination bar section. Fastener holes shall be drilled to sufficient depth and cleaned to permit proper seating of the fastener over the termination bar. Fasteners that are not properly seated shall be removed and properly reinstalled.
3. Cover the termination bar and 1-inch over and under the bar with liquid membrane.

3.4 INSULATION INSTALLATION

- A. Install one or more layers of board insulation to achieve required thickness over waterproofed surfaces. Cut and fit to within 3/4 inch of projections and penetrations.
- B. On vertical surfaces, install insulation board against shoring wall, fastened securely according to manufacturer's written instructions.

3.5 FIELD QUALITY CONTROL

- A. Owner will engage a site representative qualified by waterproofing membrane manufacturer to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components, and to furnish daily reports to Architect.
- B. For 15-year NDL warranty, provide third party monitoring required to observed substrate, waterproofing, post-rebar, and shotcrete/concrete pour, and all grade terminations.
- C. Prepare test and inspection reports.

3.6 PROTECTION, REPAIR, AND CLEANING

- A. Do not permit foot or vehicular traffic on unprotected membrane.
- B. Protect waterproofing from damage and wear during remainder of construction period.
- C. Protect installed board insulation, and insulation drainage panels, from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.
- D. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.
- E. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.
- F. Remove any masking materials after installation. Clean any stains on materials which would be exposed in the completed work.
 1. Markings are to be limited to permanent pen only. No spray paint or chalk shall be used.

- G. Protect completed membrane waterproofing and accessory products from subsequent construction activities as recommended by manufacturer.
 - 1. Membrane is to be protected from concrete splatter. Uncovered areas that receive accidental splatter are to be cleaned immediately while concrete is still wet.
- H. Provide third party observation and documentation of backfill operations to confirm the waterproofing system is not damaged during concealment.
- I. Protect from rain, strong winds, high temperatures and freezing for 48 hours minimum after application.

END OF SECTION

SECTION 07 21 00
THERMAL BUILDING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Glass-fiber blanket insulation.
2. Mineral-wool blanket insulation.
3. Mineral-wool board insulation.
4. Sound-attenuation blankets.

B. Related Requirements:

1. Section 06 16 00 "Sheathing" for board sheathing installed directly over steel framing.
2. Section 07 92 19 "Acoustical Joint Sealants" for sealing joints in sound-rated construction.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For the following:

1. Glass-fiber blanket insulation.
2. Mineral-wool blanket insulation.
3. Mineral-wool board insulation.
4. Sound-attenuation blankets.

1.5 INFORMATIONAL SUBMITTALS

- A. Installer's Certification: Listing type, manufacturer, and R-value of insulation installed in each element of the building thermal envelope.

1. For blown-in or sprayed fiberglass and cellulosic-fiber loose-fill insulation, indicate initial installed thickness, settled thickness, settled R-value, installed density, coverage area, and number of bags installed.
2. Sign, date, and post the certification in a conspicuous location on Project site.

- B. Product Test Reports: For each product, for tests performed by a qualified testing agency.

- C. Research Reports: For foam-plastic insulation, from ICC-ES.

1.6 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Apply adhesives or sealants within the range of ambient and substrate temperatures recommended in writing by waterproofing manufacturer.
 - 1. Do not apply adhesives or sealants to a damp or wet substrate or when substrate and ambient air temperatures are less than 40 deg F (4 deg C) above dew point.
- B. Maintain adequate ventilation during application and curing of adhesives or sealants materials.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Fiber glass insulation: One of the following, or equal.
 - 1. Owens Corning.
 - 2. CertainTeed.
 - 3. Knauf Insulation.
 - 4. Johns Manville.

2.2 PERFORMANCE/DESIGN CRITERIA

- A. Comply with these Specifications for thermal resistance, and to the Drawings for maximum or minimum thickness of insulation required.
 - 1. Provide the thermal resistance (R value) indicated to limit building thermal gains and losses.
 - 2. Select appropriate products from list of materials to provide (a) the specified thermal value for the building envelope, (b) compatibility when incorporated into finished system while ensuring substrate conditions as well as their ability to adhere components permanently, where applicable, in rigid manner, and (c) maintain flexibility where required in finished work.
 - 3. Provide insulation materials and their facings that do not support fungal growth when tested in accordance with ASTM C1338.

2.3 THERMAL INSULATION

- A. Thermal resistance ("R" value): Minimum of 19, except as noted.
- B. Sprayed foam sealant: Fire-rated polyurethane foam insulation meeting ASTM E 84, one- or 2-component, foamed-in-place, polyurethane foam sealant, 1.5 to 2.0 pcf density; flame spread index of 25 or less according to ASTM E 162; with primer and noncorrosive substrate cleaner recommended by foam sealant manufacturer.
 - 1. Dow.
 - 2. Tiger Foam Insulation.
 - 3. Fomo Products, Inc., or equal.

2.4 INSTALLATION MATERIALS

- A. Impaling pins and clips: Cemco 1500 Series, Tactoo Insul-Hangers Series T by AGM Industries, Inc. or equal by Eckel Industries, Inc., of appropriate length required for insulation thickness used.
- B. Adhesive used with impaling pins: Made or approved by the clip manufacturer. Do not use "peel and press" hangers with self-adhesive back.
- C. Staples, zinc-coated wires and other devices for fastening insulation: As recommended by the insulation manufacturer.
- D. Insulation tape:
 - 1. Polyethylene Adhesive Tape: "Scotch brand No. 483" by 3M.
 - 2. Foil Vapor Barrier Tape:
 - a. "FSK Copolymer" by Compac Corp.
 - b. "General Purpose FSK Facing Tape" by Venture Tape.
 - c. Or equal FSK-faced cold weathertape.

2.1 GLASS-FIBER BLANKET INSULATION

- A. Glass-Fiber Blanket Insulation, Unfaced: ASTM C665, Type I; passing ASTM E136 for combustion characteristics.
 - 1. Basis-of-Design: Knauf Insulation "Eco-Batt" or equal.
 - 2. Flame-Spread Index: Not more than 25 when tested in accordance with ASTM E84.
 - 3. Smoke-Developed Index: Not more than 50 when tested in accordance with ASTM E84.

2.2 MINERAL-WOOL BLANKET INSULATION

- A. Mineral-Wool Blanket Insulation, Unfaced: ASTM C665, Type I (blankets without membrane facing); consisting of fibers; passing ASTM E136 for combustion characteristics.
 - 1. Basis-of-Design: Rockwool "Cavity Rock", Thermafiber SAFB, or equal.
 - 2. Flame-Spread Index: Not more than 25 when tested in accordance with ASTM E84.
 - 3. Smoke-Developed Index: Not more than 50 when tested in accordance with ASTM E84.

2.3 MINERAL-WOOL BOARD INSULATION

- A. Rigid and Semi-Rigid Mineral-Wool Board Insulation: Unfaced: ASTM C612; passing ASTM E136 for combustion characteristics.

1. Basis-of-Design: Rockwool Comfortboard 110, Thermafiber RainBarrier ci High Compressive Strength Plus (110), or equal. Provide Rockwool Black Rainscreen Insulation for UV Protection, as needed.
2. Flame-Spread Index: Not more than zero when tested in accordance with ASTM E84.
3. Smoke-Developed Index: Not more than zero when tested in accordance with ASTM E84.
4. Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches and wider in width.

2.5 INTERIOR ACOUSTICAL BATT INSULATION

- A. Sound Attenuation Blankets: Provide in accordance with the Partition Schedule indicated on the drawings. ASTM C665, Type I unfaced blanket insulation with water-resistant binders produced by combining fiberglass with thermosetting resins. Density to be 1-1/2 to 3 pcf.
 1. Basis of Design: Knauf, Ecobatt; maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84.

2.4 INSULATION FASTENERS

- A. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position with self-locking washer in place.
 1. Plate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
 2. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation.

2.5 ACCESSORIES

- A. Insulation for Miscellaneous Voids:
 1. Glass-Fiber Insulation: ASTM C764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E84.
 2. Spray Polyurethane Foam Insulation: ASTM C1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84.
 3. Polyurethane Pour-In-Place Insulation: Closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84, specifically formulated for pour-in-place applications.
- B. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Install insulation with manufacturer's R-value label exposed after insulation is installed.
- D. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- E. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.3 INSTALLATION OF CAVITY-WALL INSULATION

- A. Mineral-Wool Board Insulation: Install insulation fasteners 4 inches from each corner of board insulation, at center of board, and as recommended by manufacturer.
 - 1. Fit courses of insulation between obstructions, with edges butted tightly in both directions, and with faces flush.
 - 2. Press units firmly against inside substrates.

3.4 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

- A. Blanket Insulation: Install in cavities formed by framing members. according to the following requirements:
- B. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
- C. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
- D. Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
- E. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
- F. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
 - 1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft.
 - 2. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

3.5 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.
- B. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION

SECTION 07 25 00

WEATHER BARRIERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- B. Section Includes:
1. Self-adhering sheet air and water barriers at exterior walls.
 2. Underlayment at metal standing seam roof.
- C. Related Sections:
1. Section 06 16 00 "Gypsum Sheathing".
 2. Section 07 41 13 "Standing Seam Metal Roof Panels."
 3. Section 07 42 13 "Metal Wall Panels" for cladding over weather barriers.
 4. Section 07 46 46 "Cementitious Wall Panels".
 5. Section 07 62 00 "Sheet Metal Flashings and Trim".
 6. Section 07 92 00 "Joint Sealants".

1.3 ACTION SUBMITTALS

- A. Product Data: Submit for Architect's action. Submit manufacturer's literature and installation instructions for each material and accessory, clearly notating specified requirements.
1. Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; and tested physical and performance properties of products.
- B. Safety Data Sheets (SDS): For storage at project site.
- C. Samples: Submit for Architect's action. Submit 6 in. square samples of self-adhesive membrane, self-adhesive flashing, and accessories.
- D. Shop Drawings: Submit for Architect's action. Submit shop drawings for the fabrication and installation of the Work. Prepare details at not less than 3 in. = 1 ft. scale. Show details for intersections, penetrations, inside and outside corners, terminations, expansion joints, and interface with adjacent materials.
- E. Quality Assurance/Quality Control Submittals: Submit for Architect's information.
1. Certificates:
 - a. Document Review: Submit a written statement signed by the Contractor and the Applicator stating that the Contract Documents, shop drawings and product data have been reviewed with qualified manufacturer representatives. The statement shall certify that selected materials are proper, compatible with contiguous materials and adequate for the application shown.
 - b. Installer's Qualifications

- F. Closeout Submittals: Submit for Owner's documentation.
 - 1. Warranties.
- G. CALGreen Submittals: Submit product data in accordance with Section 01 81 15 "CALGreen Requirements".
 - 1. Product Data for CALGreen 5.504.4.1 Adhesives, Sealants, Caulks: Product Data and material safety data sheets (MSDS) for adhesives and sealants used on the project, indicating VOC content of each product used.
 - 2. Product Data for Requirement 5.504.4.3: For paints and coatings, documentation indicating products meet Table 5.504.4.3 in the California Building Code, unless more stringent local limits apply.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: From air-barrier manufacturer, certifying compatibility of air barriers and accessory materials with Project materials that connect to or that come in contact with air barrier.
- C. Product Test Reports: For each air-barrier assembly, for tests performed by a qualified testing agency.
- D. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

- A. Qualified Installer: Installer to have 5 years experience in the installation of specified materials on comparable projects. The firm shall have the approval of the materials manufacturer. Installation of weather barriers, flashing, and sealant shall be the responsibility of the membrane applicator to ensure undivided responsibility.
- B. Qualified Manufacturer: Weather barrier systems shall be manufactured and marketed by a firm with a minimum of 15 years experience in the production and sales of waterproofing and air barrier products.
- C. Regulatory Requirements: Comply with applicable requirements of the laws, codes, and regulations of Authorities Having Jurisdiction (AHJs). Obtain necessary approvals from AHJs.
- D. Pre-Installation Meetings: Before the start of Work, meet at the Project site to review methods and sequence of installation, special details and conditions, quality standards, testing and quality control requirements, job organization and other pertinent topics related to the Work. The meeting shall include the Owner, Architect, Architect's consultants, Contractor, and subcontractors whose work is relevant to this Specification Section.
- E. Mockups: Before beginning installation of air barrier, provide air barrier mock-up for exterior wall assembly, incorporating backup wall construction, external cladding, window, door frame and sill, insulation, and flashing to demonstrate surface preparation, crack and joint treatment, and sealing of gaps, terminations, and penetrations of air barrier membrane.
 - 1. Coordinate construction of mockup to permit inspection by Owner's testing agency of air barrier before plaster or cladding is installed.
 - 2. If Architect determines mockups do not comply with requirements, reconstruct mockups and apply air barrier until mockups are approved.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Packing, Shipping, Handling, and Unloading: Products delivered to the job site shall be in the original unopened containers or wrappings.
- B. Storage and Protection: Handle all materials to prevent damage. Place all materials on pallets and fully protected from moisture with canvas tarpaulins.
- C. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- D. Protect stored materials from direct sunlight.
- E. Do not double-stack pallets of fluid applied components on the job site. Provide cover on top and all sides, allowing for adequate ventilation.
- F. Protect fluid-applied components from freezing and extreme heat.
- G. Store and handle in strict compliance with manufacturer's instructions, recommendations, and material safety data sheets.

1.7 FIELD CONDITIONS

- A. Proceed with weather barriers installation only after substrate preparation is complete. Obtain acceptance from the weather barriers manufacturer's representative of substrate surface before proceeding with installation. Ensure substrate is adequately prepared to receive weather barriers system. Perform work only when existing and forecasted weather conditions are within the limits established by the manufacturer of the materials used.
 - 1. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

1.8 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's written material warranty agreeing to replace air barrier membrane materials installed in conformance with manufacturer's written installation instructions that fail within 10 years from date of Substantial Completion.
- B. Installer's Warranty: Provide installer's written 5-year warranty upon completion of work. Include removing and reinstalling collateral materials associated with replacement of waterproofing that fails within specified warranty period. Warranty shall cover damage to building and contents resulting from failure to resist penetration of water.

PART 2 – PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Air barrier shall be capable of performing as a continuous weather barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, tie-ins to installed waterproofing, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

2.2 CALGREEN REQUIREMENTS

- A. 5.504.4.1 Adhesives, Sealants, Caulks: Refer to VOC limits found in Section 01 81 15 "CALGreen Requirements."
- B. 5.504.4.3 Paints and Coatings: Refer to VOC limits found in Section 01 81 15 "CALGreen Requirements."

2.3 MATERIALS, GENERAL

- A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.

2.4 SELF-ADHERING SHEET AIR AND WATER BARRIER, VAPOR PERMEABLE

- A. Modified Bituminous Sheet: 40-mil- thick, self-adhering sheet consisting of 36 mils of rubberized asphalt laminated to a 4-mil- thick, cross-laminated polyethylene film with release liner on adhesive side and formulated for application with primer that complies with VOC limits of authorities having jurisdiction.
 - 1. Basis-of-Design:
 - a. Wrapshield "VaproShield", GCP Applied Technologies "Perm-A-Barrier VPS 30", or equal.
 - 2. Physical and Performance Properties:
 - a. Air Permeance, ASTM E2178: Not to exceed 0.004 cfm/sq. ft. under a pressure differential of 0.3 in. water. (1.57 psf) (equal to 0.02L/sq. m @ 75 Pa).
 - b. Assembly Air Permeance, ASTM E2357: Not to exceed 0.04 cfm/sq.ft. under a pressure differential of 0.3 in. water (1.57 psf) (equal to 0.2 L/sq.m @ 75 Pa).
 - c. Water Vapor Permeance, ASTM E96: Not less than 13.9 perms.
 - d. Water Resistance, AATCC-127: No less than 5 hrs at 55 cm/21 inch.
 - e. Breaking Force, ASTM D5034: 55 lbf MD, and 44 lbf CD.
 - f. Pull Adhesion, ASTM D4541: min. 15 psi to primed glass faced gypsum sheathing, min.
 - g. Peel Strength, ASTM D903: 1.5 lb/in.
 - h. Water Penetration Resistance Around Nails, ASTM D1970 Modified: Pass.
 - i. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

2.5 SELF-ADHERING SHEET MEMBRANE ROOF UNDERLAYMENT

- A. Heat Resistant Butyl Sheet: 30 mil thick, self-adhering sheet consisting of butyl rubber adhesive backed by high density cross laminated polyethylene film.
 - 1. Basis-of-Design: GCP Applied Technologies "Grace Ultra."

2.6 ACCESSORY MATERIALS (For Bituminous Sheet)

- A. General: Accessory materials recommended by air-barrier manufacturer to produce a complete air-barrier assembly and compatible with primary air-barrier membrane.
- B. Primer: GCP Applied Technologies "Perm-A-Barrier Primer Plus"; a water-based primer which imparts an aggressive, high tack finish on the treated substrate. Product shall have the following minimum physical properties:
 - 1. Color: Milky White (wet), Clear (dry).
 - 2. Weight: 8.25 lbs./gal.
 - 3. Solids Content (by wt.): 53-57%.
 - 4. Solvent Type: Water.

5. VOC Content: Not to exceed 1 g/L
 6. Application Temperature: 40°F and above.
- C. Modified Self-Adhering Flashing Bituminous Strip: Vapor retarding, 40 mils thick, smooth surfaced, self-adhering; consisting of 36 mils of rubberized asphalt laminated to a 4-mil- thick, cross-laminated polyethylene film with release liner backing; Grace Perm-a-Barrier Detail Membrane.
1. Location: For use with air-barrier membrane except where otherwise shown or noted.
 2. Water Vapor Transmission, ASTM E96, Method B: 2.9 ng/m²sPa (0.05 perms) max.
 3. Air Permeance at 75Pa (0.3 in. water) pressure difference: 0.0006 L/(s.m²) (0.00012 cfm/ft²) max.
 4. Puncture Resistance, ASTM E154: 178 N (40 lbs.) min.
 5. Lap Adhesion at -4°C (25°F), ASTM D1876: 880 N/m (5.0 lbs./in.) of width
 6. Low Temperature Flexibility, ASTM D1970: Unaffected to -43°C (-45°F)
 7. Tensile Strength, ASTM D412, Die C Modified: min. 2.7 MPa (400 psi) 8
 8. Elongation, Ultimate Failure of Rubberized Asphalt, ASTM D412, Die C: min. 200%.
- D. Foil-Faced Self-Adhered Detail Membrane: 35 mils of self-adhesive rubberized asphalt integrally bonded to 5 mils of aluminum film to provide a minimum 40 mils thick membrane, Grace Perm-a-Barrier Aluminum Flashing.
- E. Termination Mastic: Air-barrier manufacturer's standard cold fluid-applied elastomeric liquid; trowel grade. Grace Bituthene Liquid Membrane.
- F. Substrate-Patching Membrane: Manufacturer's standard trowel-grade substrate filler.
- G. Adhesive and Tape: Air-barrier manufacturer's standard adhesive and pressure-sensitive adhesive tape.
- H. Joint Sealant: ASTM C 920, single-component, neutral-curing silicone; Class 100/50 (low modulus), Grade NS, Use NT related to exposure, and, as applicable to joint substrates indicated, Use O. Comply with Section 07 92 00 "Joint Sealants."
1. Provide silicone sealants for sealing flashing at storefronts, curtain walls., entrances, etc. and where shown on Drawings.
- I. Factory Formed Corners: Grace Vycorners
- J. Small Penetration Flashing: Sheet metal collars with integral flanges; "Quick-Flash" (QuickFlash Waterproofing Products, Inc.).

2.7 DRAINAGE LAYER

- A. Subject to compliance with requirements, provide WaterWay by Stuco-O-Flex.
1. Thickness: 5/16-inch.
 2. Approved Equal: 5/16-inch drainage mat by VaproShield.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
 2. Coordinate installation of the air barrier with the roof installer to ensure continuity of membrane with roof air barrier.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Fill voids, gaps, and spalled areas in substrate to provide a sound and even plane.
- D. Curing compounds or release agents used in concrete construction must be resin based without oil, wax, or pigments

3.2 SURFACE PREPARATION

- A. Clean, prepare, and treat substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air-barrier application.
- B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks according to ASTM D 4258.
 - 1. Install modified bituminous strips and center over treated construction and contraction joints and cracks exceeding a width of 1/16 inch.
- E. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.
- F. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.

3.3 INSTALLATION

- A. General: Install modified bituminous sheets and accessory materials according to air-barrier manufacturer's written instructions and according to recommendations in ASTM D 6135.
 - 1. When ambient and substrate temperatures range between 25 and 40 deg F, install self-adhering, modified bituminous air-barrier sheet produced for low-temperature application. Do not install low-temperature sheet if ambient or substrate temperature is higher than 60 deg F.
- B. Corners: Prepare, prime, and treat inside and outside corners according to ASTM D 6135.
 - 1. Install modified bituminous strips centered over vertical inside corners. Install 3/4-inch fillets of termination mastic on horizontal inside corners.
- C. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations with termination mastic and according to ASTM D 6135.
- D. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air-barrier sheet on same day. Reprime areas exposed for more than 24 hours.
 - 1. Prime glass-fiber-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.
- E. Apply and firmly adhere modified bituminous sheets horizontally over area to receive air barrier. Accurately align sheets and maintain uniform 2-1/2-inch- minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure airtight installation.

1. Apply sheets in a shingled manner to shed water without interception by any exposed sheet edges.
 2. Roll sheets firmly with a manufacturer approved hand roller to enhance adhesion to substrate.
- F. Apply continuous modified bituminous sheets over modified bituminous strips bridging substrate cracks, construction, and contraction joints.
- G. Seal top of through-wall flashings to air-barrier sheet with an additional 6-inch- wide, modified bituminous strip.
- H. Seal exposed edges of sheet at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with compatible sealant.
- I. Install air-barrier sheet and accessory materials to form a seal with adjacent construction and to maintain a continuous air barrier.
1. Coordinate air-barrier installation with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
 2. Install modified bituminous strip on roofing membrane or base flashing so that a minimum of 3 inches of coverage is achieved over each substrate.
- J. Connect and seal exterior wall air-barrier membrane continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
- K. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply modified bituminous transition strip so that a minimum of 3 inches of coverage is achieved over each substrate. Maintain 3 inches of full contact over firm bearing to perimeter frames with not less than 1 inch of full contact.
1. Modified Bituminous Transition Strip: Roll firmly with a manufacturer approved hand roller to enhance adhesion.
 2. Seal around all penetrations with air-barrier sealant.
- L. At end of each working day, seal top edge of air-barrier material to substrate with termination mastic.
- M. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- N. Repair punctures, voids, and deficient lapped seams in air barrier. Slit and flatten fishmouths and blisters. Patch with air-barrier sheet extending 6 inches beyond repaired areas in all directions.
- O. Do not cover air barrier until it has been tested and inspected by Owner's testing agency.
- P. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner may engage a qualified testing agency to perform tests and inspections and prepare test reports.

- B. Inspections: Air barrier materials and installation are subject to inspection for compliance with requirements. Inspections may include the following:
1. Continuity of air barrier system has been achieved throughout the building envelope with no gaps or holes.
 2. Continuous structural support of air barrier system has been provided.
 3. Site conditions for application temperature and dryness of substrates have been maintained.
 4. Maximum exposure time of materials to UV deterioration has not been exceeded.
 5. Surfaces have been primed.
 6. Laps in self-adhering flashing have complied with minimum requirements and have been shingled in the correct direction with no fish-mouths.
 7. Air-barrier sealant has been applied on cut edges.
 8. Self-adhering flashing been firmly adhered to substrate.
 9. Compatible materials have been used.
 10. Transitions at changes in direction and structural support at gaps have been provided.
 11. Connections between assemblies, including membrane and sealants, have complied with requirements for cleanliness, preparation and priming of surfaces, structural support, integrity, and continuity of seal.
 12. All penetrations have been sealed.
- C. Tests: Testing to be performed will be determined by Owner's testing agency from among the following tests:
1. Qualitative Testing: Air barrier assemblies will be tested for evidence of air leakage according to ASTM E1186, smoke pencil with pressurization or depressurization.
- D. Remove and replace deficient air barrier components and retest as specified above.

3.5 DRAINAGE LAYER INSTALLATION

- A. Prior to installing drainage layer, ensure the following:
1. Windows and doors have been properly flashed and sealed.
 2. Air barrier is properly installed to allow drainage without water penetration.
- B. Install drainage layer in accordance with manufacturer's written instructions and recommendations.
- C. Install drainage layer in a horizontal manner starting at the lower portion of the wall surface with subsequent layers installed abutted.
- D. At window and door openings, cut tight to vertical part of window and door casings. Take care not to cut or damage air barrier and waterproof coating.
- E. Secure drainage layer to wall with no more fasteners than is required to hold in place until lath or cladding is installed.

3.6 CLEANING AND PROTECTION

- A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.
1. Protect air barrier from exposure to UV light and harmful weather exposure as required by manufacturer. If exposed to these conditions for more than 30 days, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed membrane according to air-barrier manufacturer's written instructions.
 2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.

- B. Clean spills, stains, and soiling from construction that would be exposed in the completed Work, using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

SECTION 07 26 16

CONCRETE VAPOR TREATMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes concrete vapor treatment at interior flooring.
- B. Related Requirements:
 - 1. Section 03 30 00 "Cast-in-Place Concrete".
 - 2. Section 09 30 00 "Tiling".
 - 3. Section 09 65 19 "Resilient Tile Flooring".
 - 4. Section 09 68 13 "Tile Carpeting".

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

- A. Test Reports: Independent laboratory testing to support specified ASTM performance.
- B. Certificates:
 - 1. Installer's Qualifications

1.5 CLOSEOUT SUBMITTALS

- A. Warranties.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Firm specializing in Work of this Section, with minimum 10 years' experience.
 - 2. Completion of 5 documented projects of similar size and complexity.
 - 3. Manufacturer-employed personnel.
- B. Regulatory Requirements: Comply with applicable requirements of the laws, codes, and regulations of Authorities Having Jurisdiction (AHJs). Obtain necessary approvals from AHJs.

- C. Pre-Installation Meetings: Before the start of Work, meet at the Project site to review methods and sequence of installation, special details and conditions, quality standards, testing and quality control requirements, job organization and other pertinent topics related to the Work. The meeting shall include the Owner, Architect, Architect's consultants, Contractor, and subcontractors whose work is relevant to this Specification Section.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Packing, Shipping, Handling, and Unloading: Deliver packaged materials to the project site in manufacturer's original, unopened containers with seals unbroken and labels indicating brand names, colors, patterns, and quality designations legible and intact.
- B. Storage and Protection: Do not open containers or remove labels until materials have been inspected and accepted.

1.8 FIELD CONDITIONS

- A. Environmental Conditions: Install system treatments when concrete surface temperatures exceed 60°F and rain is not expected during scope.

1.9 WARRANTY

- A. Manufacturer's 15-year warranty for material performance and workmanship. Includes repair and replacement of finished flooring system damaged by substrate moisture at no cost to Owner.
- B. Manufacturer to guarantee the installation.
- C. Manufacturer to guarantee floor covering bond and adhesion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Performance Requirements
 - 1. Slip Resistance, Wet Dynamic Coefficient of Friction (DCoF): Wet DCoF of installed flooring shall be as follows, when measured after polishing in accordance with ANSI 326.3.
 - a. Level Surfaces: Not less than Wet 0.42.
- B. Concrete moisture compliance requirements for flooring:
 - 1. Water vapor emission: Less than 3 lbs. when tested to ASTM F1869.
 - 2. Relative humidity: Meet flooring manufacturer requirements when tested to ASTM F2170.
 - 3. Water absorption: Compliant with ASTM F3191 requirements.
- C. Flatness Tolerances: Maintain a floor flatness of FF50 (minimum of FF35) and FL20 (minimum of FL18) within 72 hours of placement when tested to ASTM E1155, following ACI 117 using 3D laser imaging to meet requirements.

1. Utilize 3D Trimble thermal laser scanner to live scan concrete placement and finishing
2. Onsite manufacturer supervision of concrete placement and finishing.
3. Post pour reporting verifying specified FF and FL values achieved.

2.2 MANUFACTURERS

- A. Manufacturer: FST Design Build Concrete, Inc. www.fstconcrete.com
1. Contact: Michael Nicodemus, Architectural Director, 916-532-5115, michael.nicodemus@fstconcrete.com

2.3 MATERIALS

- A. Preventative Vapor-Control Curing:
1. Product: Vapor-Seal 309.
 2. Type: Single-component, resin-based, liquid membrane forming compound for water vapor emission control and curing.
 3. Water retention: 0.36 kg/sq meter in 72 hours when tested to ASTM C156.
 4. Alkali Resistance: Tolerant to 5 percent alkali solution, when tested to ASTM C1308.
 5. Low-Emission: Compliant with CDPH 01350 testing.
- B. Remedial Water Vapor Emission Control:
1. Product: MES-100.
 2. Type: Two-component, moisture-alkaline tolerant epoxy meeting ASTM F3010.
 3. Perm rating: 0.10 when tested to ASTM E96.
 4. Alkali-pH resistance: up to 14pH.
 5. Vapor Emission: up to 25 lbs. when tested to ASTM F1869.
 6. Adhesion: 600psi or 100-percent concrete cohesive failure when tested to ASTM D7234.
 7. Only to be utilized if deemed necessary by FST Design Build Concrete.

2.4 ACCESSORIES

- A. Primer: Manufacturer recommended non-porous primer for securing underlayment.
- B. Underlayment:
1. Description: Moisture tolerant, Portland cement based.
 2. Compressive strength: Minimum 5,000 PSI when tested to ASTM C109.

PART 3 - EXECUTION

3.1 PREPARATION

- A. General: Prepare and scarify concrete surfaces not less than 90 days prior to moisture testing and installation of resilient flooring and carpet. Mechanically profile surface to ICRI No. 3 profile.
- B. Preparation: Grind down high spots and protrusions; clean concrete of debris and dust; and fill cracks, cavities, and low spots with a cement-based compound. Gypsum-based underlayment and filler materials shall not be permitted.

- C. Clean surfaces of debris and contaminates.

3.2 APPLICATION

- A. Apply remedial water vapor emission control in accordance with manufacturer's instructions.
- B. Prime surface to receive underlayment.
- C. Install underlayment to nominal 1/8-thickness from wall to wall; feather edge to match adjacent elevations for flooring compatibility.

3.3 FIELD QUALITY CONTROL

- A. Perform required inspection and materials required to obtain water vapor emission control and flooring manufacturers' warranty.

END OF SECTION

SECTION 072616

UNDERSLAB VAPOR RETARDER

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes: Underslab vapor retarder, complete, as shown and specified.
- B. Related Requirements:
 - 1. Section 03 30 00 "Cast-in-Place Concrete".

1.3 REFERENCES

- A. General: Comply with the applicable provisions of the referenced standards, except as modified by governing codes and the Contract Documents. Where a recommendation occurs in the referenced standards, it shall be considered mandatory. In the event of conflict, the more stringent standard or requirement shall govern.
 - 1. American Society for Testing and Materials (ASTM):
 - a. ASTM E96 "Test Methods for Water Vapor Transmission of Materials".
 - b. ASTM E1643 "Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs".
 - c. ASTM E1745 "Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs".

1.4 SUBMITTALS

- A. Product Data: Submit for Architect's action. Submit copies of specifications, standard installation details, installation instructions, and general recommendations by manufacturer of vapor retarder materials.
- B. Shop Drawings: Show details for special conditions not covered by manufacturer's standard published details. Show terminations and penetration detailing.
- C. Certification:
 - 1. Prior to Commencement of Installation: Submit the following:
 - a. Certification from manufacturer of vapor retarder materials that applicator complies with qualification requirements specified.

2. Prior to Delivery of Materials: Certification that materials and components proposed for use conforms to requirements shown and specified.
 3. Prior to Acceptance of the Work: Certification stating that materials and workmanship have been provided in conformance with Contract Documents and material manufacturer's requirements.
- D. Product Test Reports: For tests referenced of each vapor retarder material, performed by a qualified testing agency.
- E. Warranties: Sample of warranties.

1.5 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum ten (10) years verified experience.
1. Manufacturer shall make available factory-trained representatives for consultation at Project site at no additional cost to the Owner.
- B. Installer's Qualifications:
1. Minimum 5 years' experience with specified materials on projects of similar scope and complexity.
 2. Acceptable to manufacturer of vapor retarder materials.
- C. Materials: For each type of material required for the work of this section, provide primary materials that are the products of one manufacturer.

1.6 PROJECT CONDITIONS

- A. Jobsite Meeting: Prior to starting Work, arrange a jobsite meeting with Architect and participants in the coordination meeting to discuss Contract Documents, review step-by-step application procedure, shop drawings, job and surface readiness, and material storage and protection.
- B. Notification: Notify Architect 2 calendar days prior to jobsite meeting, starting Work, and if Work is done intermittently, before restarting Work.
- C. Schedule Coordination: Schedule work such that membrane will not be left exposed to weather for longer than that recommended by the manufacturer.
- D. Perform all mandatory ASTM E1745 testing on a single production roll per ASTM E1745 Section 8.1.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in labeled packages. Store and handle in strict compliance with manufacturer's instructions. Protect from damage from weather, excessive temperature and

construction operations. Remove and dispose of damaged material in accordance with applicable regulations.

1.8 WARRANTY

- A. Warranty: Manufacturer's written warranty agreeing to repair or replace materials that do not comply with requirements of this Section or that deteriorate during the warranty period.
 - 1. Warranty Period: Manufacturer's standard "Life of the Building Warranty" from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Vapor Retarder: Provide where indicated or at slabs on grade to receive applied floor finishes. ASTM E1745, Class A. Water vapor transmission rate shall be no greater than 0.01 gr./ft²/hr, when tested in accordance with mandatory conditioning tests per ASTM E1745 Section 7.1.
 - 1. Basis of Design:
 - a. Stego Industries LLC, "Stego Wrap Vapor Barrier (15-mil)" or equal.
 - 2. Maintain permeance of less than 0.01 Perms after mandatory conditioning tests per ASTM E154 Sections 8,11,12, and 13.
 - 3. Tensile Strength: Minimum 70 pounds/inch per ASTM E154 Section 9 (Method D882).
 - 4. Puncture Resistance: Minimum 2400 grams, complying with ASTM D1709, Method B.
 - 5. Thickness: 15 mils.
- B. Accessory Products:
 - 1. Vapor Barrier Seam Tape: 3-inch CreteClaw Tape to be used at all vapor barrier lapped seams instead of standard Stego Tape.
 - 2. Seam Tape: Pressure-sensitive seam tape recommended by the selected vapor retarder manufacturer for use in sealing seams and penetrations with their product under actual project conditions with a Water Vapor Transmission Rate per ASTM E96 0.3 perms or lower.
 - 3. Vapor Proofing Mastic: Vapor proofing mastic recommended by the selected vapor retarder manufacturer for use with their product under actual project conditions with a Water Vapor Transmission Rate per ASTM E96 0.3 perms or lower.
 - 4. Double-Sided Perimeter Tape: StegoTack Tape, double-sided to be used for bonding onto footings.
 - 5. Liquid Mastic: Stego Mastic to be used to seal all penetrations through vapor barrier in combination with Stego Tape.
 - 6. Pipe Boots: Construct pipe boots from vapor barrier material, pressure sensitive tape and/or mastic per manufacturer's instructions.
- C. Capillary Break: Open graded, clean coarse rock no larger than 3/4-inch; river-run rock.

PART 3 - EXECUTION

3.1 GENERAL

- A. Manufacturer's Instructions: Prepare substrates, apply primers and install the work, including components and accessories, in accordance with the manufacturer's instructions, except where more stringent requirements are shown or specified. Examine the areas to receive the Work and remedy detrimental conditions.

3.2 INSTALLATION

- A. Granular Course: Cover base drainage layer with fine-graded granular material, moisten, and compact with mechanical equipment to elevation tolerances of plus 0 inch or minus 3/4 inch.
 - 1. Provide minimum 6 inches deep capillary break.
 - 2. Note: Do not place granular course or sand above vapor retarder.
- B. Vapor Retarder for Slabs on Grade: Install in accordance with requirements of ASTM E 1643. Place sheet to create fewest number of laps with long dimension parallel to length of the slab area. Make laps a minimum of 6 inches wide. Completely seal the laps and penetrations with waterproof seaming tape. Ballast the sheet as required to hold in place and protect from damage during placement of reinforcing and concrete. Install to configuration shown.
 - 1. Turn down at edges and intervening foundations.
 - a. Tape to top of footing.
 - 2. Verify that vapor barrier is placed directly in contact with structural concrete slab. No sand or blotter layer is allowed.
 - a. Seal vapor barrier lapped seams with Vapor Barrier Seam Tape instead of manufacturer's standard seam tape.
 - 3. Turn onto foundation walls, lap face of wall at least 6-inches and seal in place with approved adhesive.
 - 4. Seal to pipes and other permanent penetrations watertight with manufacturer's mastic compound in addition to a target patch of membrane sealed with tape. Note: Sealing penetrations with only tape shall not be a permitted.
 - 5. Seal around screed supports or other temporary penetrations with 1-1/2-inch fillet of plastic cement.
 - 6. Seal perimeter vapor barrier conditions with Double-Sided Tack Tape to bond to the concrete footings.
 - 7. No penetration of vapor barrier is allowed except for reinforcing steel and permanent utilities.
 - 8. Repair damaged vapor retarder before covering with other materials.

3.3 FIELD QUALITY CONTROL

- A. Arrange for manufacturer's technical personnel to inspect project conditions prior to installation of vapor retarder and to provide Owner with letter of confirmation that the installation is in conformance with the manufacturer's requirements. Representative shall inspect completed membrane installation prior to concrete pour and damaged membrane shall be repaired as recommended by manufacturer at no additional cost to Owner.
- B. Additional inspections, at Contractor's expense, shall be performed to determine compliance of replaced or additional work with specified requirements.

3.4 PROTECTION

- A. Do not allow vapor retarder to be pierced or otherwise compromised do to adjacent Work by others.
- B. Provide screed pads to hold screed posts or similar non-penetrating techniques to restrain screed boards.
 - 1. Do not use screed stakes in areas where the vapor retarder membrane is installed.
- C. Repair all damage to vapor retarder per manufacturer's recommendations prior to covering by other materials.

END OF SECTION

SECTION 07 41 13

STANDING-SEAM METAL ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes standing-seam metal roof panels.
- B. Related Sections:
 - 1. Section 05 40 00 "Cold-Formed Metal Framing."
 - 2. Section 06 16 00 "Sheathing."
 - 3. Section 07 21 00 "Thermal Building Insulation."
 - 4. Section 07 25 00 "Weather Barriers" for high-temperature underlayment.
 - 5. Section 07 62 00 "Sheet Metal Flashing and Trim."
 - 6. Section 07 92 00 "Joint Sealants."
 - 7. Section 09 96 00 "High Performance Coatings."

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of roof accessories and roof-mounted equipment.
 - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
 - 4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
 - 5. Review structural loading limitations of deck during and after roofing.
 - 6. Review flashings, special details, drainage, penetrations, equipment curbs, and condition of other construction that affect metal panels.
 - 7. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
 - 8. Review temporary protection requirements for metal panel systems during and after installation.
 - 9. Review procedures for repair of metal panels damaged after installation.

10. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.
2. Provide product data that clearly delineates how the proposed product meets the Performance Requirements specified.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
 - a. Profile.
 - b. Gauge of panel.
 - c. Location and type of fasteners.
 - d. Shape and method of attachment of all trim.
 - e. Locations and type of sealants.
 - f. Other details as may be required for a weathertight installation.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches.

C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

1. Metal Panels: 12 inches long by actual panel width. Include clips, fasteners, closures, and other metal panel accessories.

D. Delegated Design: Design standing seam metal roofing system, submit comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Manufacturer Installation Instructions: Provide manufacturer's written installation instructions including proper material storage, material handling, installation sequence, panel location(s), and attachment methods, details and required trim and accessories.

C. Product Test Reports: For each product, for tests performed by a qualified testing agency.

D. Field quality-control reports.

E. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For metal panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer shall have a minimum of ten (10) years experience in the production of metal roof panels. Manufacturer shall demonstrate past experience with examples of projects of similar type and exposure.
- B. Installer Qualifications: Installer shall be authorized by the manufacturer regarding proper installation of the specified product. Installer shall have a minimum of five years' experience in the installation of standing seam metal roofing.
- C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 - 1. Build mockup of typical roof area and eave, including fascia, and soffit as shown on Drawings; approximately 12 feet square by full thickness, including attachments, underlayment, and accessories.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Retain strippable protective covering on metal panels during installation.

1.9 FIELD CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.10 COORDINATION

- A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.
- B. Coordinate metal panel installation with rain drainage work, flashing, trim, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

- A. **Manufacturer Warranty:** Furnish to the Owner a written manufacturer warranty for products, components, and accessories against all patent and latent defects, and incipient and catastrophic failure for 25 years; and for finishes against color fading, chalking, cracking, checking, peeling, and adhesive failure for 25 years.
- B. **Installer Guarantee:** Furnish to the Owner a written guarantee for the work of this specification section against all defects in materials and workmanship for 2 years from date of acceptance. Guarantees must be properly prepared and signed on the guarantee form in Division 01.
- C. **Special Warranty on Panel Finishes:** Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. **Exposed Panel Finish:** Deterioration includes, but is not limited to, 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 paint to adhere to bare metal.
 - 2. **Finish Warranty Period:** 20 years from date of Substantial Completion.
- D. **Special Weathertightness Warranty:** Manufacturer's standard form in which manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that fail to remain weathertight, including leaks, within specified warranty period.
 - 1. **Warranty Period:** 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. **Solar Reflectance Index:** Minimum **[29,] [78,]** tested to ASTM C1549 and calculated in accordance with ASTM E1980.
- B. **Fire hazard classification:** Class A, tested to ASTM E108
- C. **Structural Performance:** Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:

1. Wind Loads: Uniform pressure as indicated on Drawings.
 2. Deflection Limits: For wind loads, no greater than 1/180 of the span.
- D. Air Leakage: 0.000 CFM per square foot of roof area, measured at reference differential pressure across assembly of 40 PSF, tested to ASTM E1680
- E. Water Leakage: None, tested to ASTM E1646 at test pressure of 40.0 PSF
- F. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class as indicated on Structural drawings.
1. Uplift Rating: UL 90, tested to UL 580.
- G. Panel Attachment: Factory Mutual 4471, Class 1.
- H. Energy Performance: Provide roof panels that are listed on the EPA/DOE's ENERGY STAR "Roof Product List" for low-slope roof products.
1. Energy Star Qualified: Metal panels shall meet the requirements of Energy Star Roofing Products for low slope.
 2. Solar Reflectance Index: Panels shall have a solar reflectance Index of not less than 78 for low-sloped roofs.
- I. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.2 MANUFACTURER

- A. Basis of Design Product: Subject to compliance with requirements, provide "SLR-16-0 Architectural Metal Roof Panels" by Morin; a Kingspan Group Company; 685 Middle Street, Bristol, CT 06010 ; 1-800-640-9501 (Toll Free); www.morincorp.com

2.3 STANDING-SEAM METAL ROOF PANELS

- A. General: Provide factory-formed, pre-finished, 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 inside laps. Include clips, cleats, pressure plates, and accessories required for weathertight installation.
1. Steel Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E 1514.
 2. Steel Sheet: Aluminum-zinc alloy-coated steel sheet complying with ASTM A792, Class AZ50, Grade 50 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A755.
 - a. Nominal Thickness: 22 gauge.

- b. Panel Width: 16-inch.
- c. Profile: SRL-16-0
- d. Seam height: 2 inches.
- e. Seam type: Mechanical double locked.
- f. Texture: Smooth.
- g. Factory Sealant: Manufacturer's standard butyl sealant for weather resistance.
- h. Exterior Finish: Three-coat fluoropolymer factory finish.
- i. Color: As selected by Architect from manufacturer's full range.

2.4 MISCELLANEOUS MATERIALS

- A. Slip Sheet: Manufacturer's recommended slip sheet, of type required for application.
- B. Miscellaneous Metal Subframing and Furring: ASTM C 645; cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 coating designation or ASTM A 792/A 792M, Class AZ50 coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.
- C. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.
 - 1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal panels.
 - 2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
 - 3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch-thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- D. Insulation: ACFoam-III by Atlas Roofing Corporation.
- E. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.
- F. Gutters: Formed from same material as roof panels, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch-long sections of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Provide gutter supports spaced a maximum of 36 inches o.c., fabricated from same metal as gutters. Provide wire ball strainers of compatible metal at outlets. Finish gutters to match metal roof panels.
- G. Downspouts: Formed from same material as roof panels. Fabricate in 10-foot-long sections, complete with formed elbows and offsets, of size and metal thickness according to SMACNA's "Architectural Sheet Metal Manual." Finish downspouts to match gutters.
- H. Panel Fasteners: Self-tapping screws designed to withstand design loads.
- I. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2-inch wide and 1/8 inch thick.
2. Joint Sealant: ASTM C 920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

2.5 FABRICATION

- A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.
- C. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.
- D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.
 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 2. Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 3. Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
 4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
 5. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.
 - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal panel manufacturer for application, but not less than thickness of metal being secured.

2.6 FINISHES

- A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are unacceptable.

C. Steel Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Basis-of-Design: Sherwin Williams Flurothane Coastal.
2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.
 1. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.
 2. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.
 - a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Provide field measurements to manufacturer as required to achieve proper fit of the metal roof panels to building envelope. Measurements shall be provided in a timely manner so that there is no impact to construction or manufacturing schedule.
- C. Supporting Substrate: Solid substrate is required for installation of panels shall be by others. Substrate shall be installed within the following tolerances:
 1. Plus or minus 1/8 inch in 5 feet in any direction along plane of framing.
 2. Plus or minus 1/4 inch cumulative in 20 feet in any direction along plane of framing.
 3. Plus or minus 1/2 inch from framing plane over entire roof.
- D. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.
- E. Examine individual panels upon removing from the bundle; notify manufacturer of panel defects. Do not install defective panels.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

3.3 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply over the entire roof area, wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.
- B. Primer: Prime surfaces as required by underlayment manufacturer.
- C. Apply to substrate only when environmental conditions and temperatures are as required by underlayment manufacturer.
 - 1. Begin installation at low point of roof and place underlayment under entire metal roof panel surface so that underlayment is wrinkle free. Underlayment shall be installed in a shingle fashion to shed water with a minimum lap of 3-1/2 inches. End laps shall be minimum 6 inches and staggered minimum 24 inches between courses.
 - 2. Roll laps with roller.
 - 3. Cover underlayment within 14 days.
- D. Slip Sheet: Apply slip sheet over underlayment before installing metal roof panels.
- E. Flashings: Install flashings to cover underlayment to comply with requirements specified in Section 07 62 00 "Sheet Metal Flashing and Trim".

3.4 METAL ROOF PANEL INSTALLATION

- A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement. Install roof panels weathertight, without distortion, buckles or waves.
 - 1. Shim or otherwise plumb substrates receiving metal panels.
 - 2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
 - 3. Install screw fasteners in predrilled holes.
 - 4. Locate and space fastenings in uniform vertical and horizontal alignment.
 - 5. Install flashing and trim as metal panel work proceeds.
 - 6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
 - 7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.

8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.
- B. Standing-Seam Metal Roof Panel Installation: Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended in writing by manufacturer.
 1. Install clips to supports with self-tapping fasteners.
 2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
 3. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied sealant.
- C. Fasteners: Use stainless-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
- D. Anchor Clips: Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.
- E. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.
- F. Standing-Seam Metal Roof Panel Installation: Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended in writing by manufacturer.
 1. Install clips to supports with self-tapping fasteners.
 2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
 3. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied sealant.
 4. Watertight Installation:
 - a. Apply a continuous ribbon of sealant or tape to seal joints of metal panels, using sealant or tape as recommended in writing by manufacturer as needed to make panels watertight.
 - b. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
 - c. At panel splices, nest panels with minimum 6-inch end lap, sealed with sealant and fastened together by interlocking clamping plates.
- G. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.
 1. Install components required for a complete metal panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal roof panel manufacturers; or, if not indicated, types recommended by metal roof panel manufacturer.
- H. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without buckling and tool marks, and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and achieve waterproof and weather-resistant performance.
 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).
- I. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to metal roof panels as recommended by manufacturer.
 - J. Roof Curbs: Install flashing around bases where they meet metal roof panels.
 - K. Gutters: Join sections with riveted and soldered or lapped and sealed joints. Attach gutters to eave with gutter hangers spaced not more than 36 inches o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.
 - L. Downspouts: Join sections with telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c. in between.
 1. Provide elbows at base of downspouts to direct water away from building.
 2. Connect downspouts to underground drainage system indicated.

3.5 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align metal panel units within installed tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.6 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect metal roof panel installation, including accessories. Report results in writing.
- B. Remove and replace applications of metal roof panels where tests and inspections indicate that they do not comply with specified requirements.
- C. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.
- D. Prepare test and inspection reports.

3.7 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On

completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

- B. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 07 42 13
METAL WALL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Exposed fastener, single skin perforated and non-perforated, metal wall panels used as a screen wall.
 - 2. Accessories including fasteners, perimeter trim and penetration treatments.
- B. Related Sections:
 - 1. Section 07 92 00 "Joint Sealants".

1.3 SUBMITTALS

- A. Refer to Section 01 33 00 Submittal Procedures.
- B. Product Data: Submit manufacturer current technical literature for each type of product.
- C. Delegated Design: Design metal wall panel assembly, submit comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- D. Shop Drawings - Submit detailed drawings showing:
 - 1. Profile
 - 2. Gauge of panel
 - 3. Location, layout and dimensions of panels
 - 4. Location and type of fasteners
 - 5. Shape and method of attachment of all trim
 - 6. Locations and type of sealants
 - 7. Installation sequence.
 - 8. Other details as may be required for a weathertight installation
- E. Samples: Provide nominal 3 x 5 inch of each color indicated. Provide panel width by 10 inches long minimum.

- F. Quality Assurance Submittals
 - 1. Manufacturer Erection Instructions: Provide manufacturer's written installation instructions including proper material storage, material handling, installation sequence, panel location(s), and attachment methods, details and required trim and accessories.
- G. Closeout Submittals
 - 1. Refer to Section 01 77 00 Closeout Submittals.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Pre-installation meeting: Conduct a pre-installation meeting at the job site attended by Owner, Architect, Manufacturer's Technical Representative, Panel Installer, and Contractors of related trades. Coordinate structural support requirements in relation to wall panel system, installation of any separate air/water barriers, treatment of fenestration, and other requirements specific to the project.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer shall have a minimum of ten (10) years experience in the production of metal wall panels. Manufacturer shall demonstrate past experience with examples of projects of similar type and exposure.
- B. Installer Qualifications: Installer shall be authorized by the manufacturer and the work shall be supervised by a person having successfully completed a manufacturer training seminar regarding proper installation of the specified product.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Refer to Section 01 60 00 Product Requirements.
- B. Deliver panel materials and components in manufacturer's original, unopened, undamaged packaging with identification labels intact.
- C. Store wall panel materials on dry, level, firm, and clean surface. Elevate one end of bundle to allow moisture run-off, cover and ventilate to allow air to circulate and moisture to escape.

1.7 WARRANTY

- A. Refer to Section 01 70 00 Closeout Procedures.
- B. Material Warranty: Standard form in which manufacturer agrees to repair or replace items that fail in materials or workmanship within specified warranty period. The items covered by the warranty include structural performance.
 - 1. Warranty Period: Two (20) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Kingspan Group Company; 685 Middle Street, Bristol, Connecticut 06010; 1-800-640-9501 (Toll Free); (www.morincorp.com).
- B. Basis of Design: Morin "Exposed Fastener Wall Panels".

2.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal wall panel systems designed to resist the following. Testing shall be done based on ASTM E1592:
 - 1. Wind Loads: Determine loads based on the following minimum design wind pressures:
 - a. Uniform pressure as indicated on Drawings.
 - 2. Deflection Limits: Perforated metal wall panel assemblies shall withstand horizontal deflections no greater than L/90 of the span.
- B. Water Penetration under Static Pressure: Provide metal wall panel systems designed to resist penetration of water under static pressure. Testing shall be based on ASTM E331. Wall panels when tested shall have no water leakage at 6 pounds per square foot.
- C. Air Infiltration: Provide metal wall panel assemblies designed to resist air infiltration. Testing shall be done based on ASTM E283. Wall panels when tested shall have a maximum air leakage of 0.01 cfm per square feet of fixed wall area at a minimum static air-pressure differential of 1.57 foot-pounds per square foot.
- D. Deflection Limits: Perforated metal wall panel assemblies shall withstand horizontal deflections no greater than L/180 of the span.

2.3 WALL PANEL MATERIALS

- A. Aluminum:
 - 1. Coil Stock meeting ASTM B209; Alloy and temper as required for forming operations.
 - 2. Gauge: 0.040 inch and 0.080 inch at perforated metal scrim to meet span requirements.

2.4 METAL WALL PANELS

- A. Exposed Fastener BR7-35.
 - 1. Profile: A and B.
 - 2. Panel Width: 35 inches.
 - 3. Panel Depth: 1.5 inches.
 - 4. Texture: Non-perforated as shown on Drawings.

2.5 ACCESSORIES

- A. Wall panel accessories: Provide accessories as required for a complete installation. Accessories shall be as indicated on approved shop drawings and per manufacturer's approved standard details. Match material and finish of metal wall panels
 - 1. Fasteners: Fasteners with neoprene washers as recommended by manufacturer. Fastener head shall match exposed panel color.
 - 2. Metal Profile Closure Strips: Shall be fabricated from same gauge, material and finish as metal panel.
- B. Trim:
 - 1. Fabricate trim from same material and material thickness as wall panels. Finish to match metal wall panels.
 - 2. Locations include, but are not limited to the following: drips, sills, jambs, corners, framed openings, parapet caps, reveals and fillers.
- C. Scrim: Fabricate from same corrugated material as wall panels.
- D. Panel Sealant:
 - 1. Joint Sealant: ASTM C920 as recommended in writing by metal wall panel manufacturer.
 - 2. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing; 1/8 inch wide and 1/8 inch thick.
 - 3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

2.6 FABRICATION

- A. Metal wall panels shall be formed to lap and interconnect with edges of adjacent panels which are then mechanically attached through panel to supports using fasteners with a neoprene washer. Fastener head shall match wall panel finish.
- B. Fabricate metal wall panels to eliminate condensation on interior side of panel and with joints between panels designed to form weathertight seals.
- C. Panels shall be factory formed. Field formed panels are not acceptable.
- D. Provide manufacturer's standard extruded aluminum trim.
- E. Mitered Corners: Structurally bonded horizontal outside or inside trimless corners matching metal wall panel material, profile and factory applied finish shall be fabricated by metal wall panel manufacturer.
 - 1. Welded, riveted or field fabricated corners are not acceptable and will be rejected.

2.7 FINISHES

- A. Aluminum: To be determined.
 - 1. Finish and Color: To be determined.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Provide field measurements to manufacturer as required to achieve proper fit of the metal wall panels to building envelope. Measurements shall be provided in a timely manner so that there is no impact to construction or manufacturing schedule.
- B. Supporting Steel: Verify that Supporting Steel members are installed within the following tolerances:
 - 1. Plus or minus 1/8 inch in 5 feet in any direction along plane of framing.
 - 2. Plus or minus 1/4 inch cumulative in 20 feet in any direction along plane of framing.
 - 3. Plus or minus 1/2 inch from framing plane on any elevation.
 - 4. Plumb or level within 1/8 inch at all changes of transverse for performed corner panel applications.
 - 5. Verify that bearing support has been provided behind vertical joints of horizontal panel systems and vertical joints of horizontal panel systems. Width of support shall be as recommended by manufacturer.
- C. Examine individual panels upon removing from the bundle; notify manufacturer of panel defects. Do not install defective panels.

3.2 PANEL INSTALLATION

- A. Installation shall be in accordance with manufacturer's installation guidelines and recommendations.
- B. Install panels plumb, level, and true-to-line to dimensions and layout indicated on approved shop drawings.
- C. Cutting and fitting of panels shall be neat, square and true. Torch cutting is prohibited.

3.3 TRIM INSTALLATION

- A. Place trim and trim fasteners only as indicated per details on the approved shop drawings.
- B. Apply sealant tape at trim, per manufacturer's details and approved shop drawings, for weathertight installation.

3.4 SEALANT INSTALLATION FOR EXPOSED JOINTS

- A. Clean and prime surfaces to review exterior exposed sealants in accordance with sealant manufacturer's recommendations.
- B. Follow sealant manufacturer's recommendations for joint width-to-depth ratio, application temperature range, size and type of backer rod, and compatibility of materials for adhesion.

3.5 CLEANING AND PROTECTION

- A. Remove protective film immediately after installation.
- B. Touch-up, repair or replace metal panels and trim that have been damaged.
- C. After metal wall panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

END OF SECTION

SECTION 07 46 46

CEMENTITIOUS WALL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes fiber-cement panels.
- B. Related Requirements:
 - 1. Section 05 40 00 "Cold-Formed Metal Framing".
 - 2. Section 06 1 600 "Sheathing".
 - 3. Section 07 21 00 "Building Insulation".
 - 4. Section 07 25 00 "Weather Barriers" for weather-resistive barriers.
 - 5. Section 09 91 00 "Painting and Coating".

1.3 COORDINATION

- A. Coordinate siding installation with flashings and other adjoining construction to ensure proper sequencing.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product. Manufacturer's recommended installation details and technical literature describing cementitious products, shop-applied coatings, and installation recommendations. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Samples: Submit selection and verification samples for finishes, colors and textures.
 - 1. Selection Samples: Manufacturer's color charts or chips illustrating full range of colors, finishes and patterns available.
 - 2. Verification Samples:
 - a. Finish: Include separate Composite Sample: 12 inch x 12 inch or larger system sample of panels in thickness specified showing 4-way joint, from an available

stock color, including extrusions, anchors, supports, fasteners, closures and other panel accessories, for assembly approval.

C. Shop Drawings:

1. Provide detailed drawings of non-standard applications of fiber-cement materials which are outside the scope of the standard details and specifications provided by the manufacturer. Shop drawings are to show layout, profiles, and product components, including edge conditions, panel joints, fixture location, anchorage, accessories, finish colors, patterns and textures.
2. Shop drawings shall be project specific. Typical generic details are not acceptable.

D. Qualifications, as specified under Quality Assurance.

1.6 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer Qualifications:
 - a. Company with a minimum of 10 years of continuous experience manufacturing panel material of the type specified.
 - b. Able to provide specified warranty on finish.
 - c. Able to provide a list of 5 other projects of similar size, including approximate date of installation and the name of the Architect for each.
 - d. Able to provide certificate of registration of ISO 9001-2000.
2. Fabricator Qualifications: The panel system fabricator shall be approved by the panel manufacturer and have a minimum of ten years of experience fabricating panel systems for projects of a similar or larger size.
3. Installer Qualifications: All products listed in this section are to be installed by a single installer trained and/or approved by the Fabricator or Manufacturer.
4. Contractor shall engineer the Cementitious Wall Panels section, as specified herein. Professional engineer shall be licensed in the State of California and shall have at least ten years of experience engineering assemblies similar in complexity.

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and to set quality standards for fabrication and installation.

1. Build mockup of typical wall area as shown on Drawings.
2. Build mockups for fiber-cement siding, including accessories.
 - a. Size: 48 inches long by 60 inches high.
 - b. Include outside corner on one end of mockup and inside corner on other end.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 INFORMATIONAL SUBMITTALS

- A. Calculations: Prepared, stamped and signed by a Professional Engineer licensed in the State of California.
- B. Product Certificates: For each type of fiber-cement siding.

- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for fiber-cement siding.
- D. Research/Evaluation Reports: For each type of fiber-cement siding required, from ICC-ES.
- E. Sample Warranty: For special warranty.

1.8 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of product, including related accessories, to include in maintenance manuals.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with labels intact until time of use.
- B. Store materials on elevated platforms, under cover, and in a dry location. Protect edges and corners from chipping.

1.10 WARRANTY

- A. Manufacturer: Furnish fiber-cement manufacturer's non-pro-rated 10-year product warranty against manufacturing defects.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including cracking and deforming.
 - b. Deterioration of materials beyond normal weathering.
 - 2. Warranty Period: 30 years from date of Substantial Completion.
 - 3. Workmanship Warranty: Application limited warranty for 2 years.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Performance Requirements: Provide panels that have been manufactured, fabricated, and installed to maintain performance criteria stated by the manufacturer and fabricator without defects, damage, or failure.
- B. Provide panels, system components and supports such that the cladding complies with performance requirements indicated below and is capable of withstanding structural movement, thermally induced movement and exposure to weather without failure.
- C. Structural Performance: Refer to Structural Drawings.
- D. Deflection: Maximum deflection between panel supports is 1/300.
- E. Design Temperature Range: -40 deg. F to 176 deg. F.

2.2 MANUFACTURERS

- A. Source Limitations: Obtain products, including related accessories, from single source from single manufacturer.
- B. Basis of Design: Fiber-cement panels shall be manufactured by James Hardie Building Products, Inc.

2.3 FAÇADE MATERIAL

- A. Wall Panels: James Hardie.
 - 1. Profile: To be determined.
 - 2. Application: Exterior
 - 3. Thickness: 7/16 inch.
 - 4. Color: As shown on Finish Schedule.
 - 5. Panel Size: To be determined.

2.4 FAÇADE SYSTEM

- A. Attachment System: To be determined.
- B. Fabrication
 - 1. Fabricate wall panels to the size, configuration and layout as shown on approved shop drawing submittals.
 - 2. Form panel lines, breaks and angles to be sharp and true, with surfaces that are free from warp or buckle.
 - 3. Panels shall be marked to coordinate with the approved shop drawings.
 - 4. Fasteners in profile shall accommodate thermal expansion/contraction of metal and not interfere with panel application.

2.5 ACCESSORIES

- A. Siding Accessories, General: Provide starter strips, edge trim, outside and inside corner caps, and other items as recommended by siding manufacturer for building configuration.
 - 1. Provide accessories matching color and texture of adjacent siding unless otherwise indicated.
- B. Flashing: Provide flashing complying with Section 07 62 00 "Sheet Metal Flashing and Trim" at window and door heads and where indicated.
- C. Fasteners: AISI Type 316 screws, as recommended by manufacturer to meet Performance Requirements.
- D. Perforated Insect/Vermin Screen: Manufacturer's standard.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions and product carton instructions for installation.

3.2 EXAMINATION

- A. Verify substrate conditions which have been previously installed under other sections or by other installers are acceptable for product installation in accordance with manufacturer's instructions. Notify Contractor of unsatisfactory preparation. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Surfaces to receive panels shall be even, smooth, dry, and free from defects detrimental to the installation of the panel system. Notify Contractor in writing of conditions detrimental to proper and timely completion of the work.
- C. Confirm exterior sheathing is plumb and level, with no deflection greater than 1/4 inch in 20 feet.
- D. Visually check that air and moisture barrier behind panel system appears to be installed correctly before proceeding or notify the General Contractor if there are deficiencies that must be addressed before commencing the panel installation.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

- A. Clean panel surfaces thoroughly prior to installation. Remove any cutting or drilling dust from the surface of the panel using a micro-soft cloth.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions. Clean substrates of projections and substances detrimental to application.

3.4 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply. Commence installation of Cementitious Wall Panels in the presence of the manufacturer's representative. Install minimum of 300 sq. ft. in presence of representative.
 - 1. Do not install damaged components.
 - 2. Sub-framing tolerances: Shim and align sub-framing to the following: Within 1/4 inch in 20 feet on level, plumb and panel joint lines.
 - 3. Attach fasteners through predrilled holes to Cold-Formed hat channels.
 - 4. Install accessories and closure panels as shown or required for a complete installation.

3.5 ADJUSTING AND CLEANING

- A. Remove temporary coverings and protection of adjacent work areas. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove construction debris from project site and legally dispose of debris.
- B. Remove damaged, improperly installed, or otherwise defective materials and replace with new materials complying with specified requirements.

3.6 PROTECTION

- A. Protect installed product and finish surfaces from damage during construction until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 07 54 19

SINGLE PLY ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
1. Adhered, felt-backed, thermoplastic membrane roofing system.
 2. Cover board.
 3. Roof insulation.
- B. Related Sections:
1. Section 06 10 53 "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking.
 2. Section 07 62 00 "Sheet Metal Flashing and Trim" for metal roof penetration flashings, flashings, and counterflashings.
 3. Section 07 92 00 "Joint Sealants" for joint sealants, joint fillers, and joint preparation.
 4. Section 22 14 23 "Storm Drainage Piping Specialties" for roof drains.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
1. Most recent published technical literature and guide specifications issued by manufacturer.
 2. Roofing Contractor's approved copy of submittal form.
 3. Preparation instructions and recommendations.
 4. Storage and handling requirements and recommendations.
 5. Typical installation methods.
 6. Dimensioned shop drawings, including roof plan detailing perimeter enhancement, flashing methods, terminations, and acceptance by manufacturer.
 7. Written approval from manufacturer confirming any accessories submitted, not manufactured or expressly approved in manufacturer's literature are acceptable and compatible with the proposed roofing system.
 8. Certification that the system specified complies with identifiable building code and insurance requirements.
 9. Provide Solar Reflectance Index value documentation as listed in this section.
- B. Safety Data Sheets (SDS): For storage at project site.
- C. Shop Drawings: Provide shop drawings for assemblies indicated below. Do not copy and provide Engineer's construction.
1. Flashing terminations.
 2. Layout and quantity of walkway pads. Include plans, dimensions, connection to roof, and relationship to adjacent roofing appurtenances.

3. Include plans, dimensions, connection to roof, and relationship to adjacent roofing appurtenances.
 4. All membrane-clad sheet metal configurations.
 5. Layout of tapered insulation and/or crickets including, but not limited to, slope, heights from drain, connections/securement to structural deck.
 6. Shop drawing showing Manufacturer's required number of perimeter half sheet for project specific uplift requirements, per building.
 7. Shop drawing showing Manufacturer's required plate and fastener spacing pattern for both half sheets and field sheets for project specific uplift requirements, per building.
 8. Shop drawing showing Manufacturer's required plate and fastener spacing pattern for perimeters, base of walls, curbs, vent pipes or any other roof penetrations for project specific uplift requirements, per building.
- D. Samples for Verification: Two representative units of each type, size, pattern, and color, for all products.
- E. Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions requiring special attention.
- F. Wind Uplift Resistance Submittals: For roofing system, indicating compliance with wind uplift performance requirements.
- G. Copy of Manufacturer's NOA forms.
- H. Approved Contractor Certification: Signed by manufacturer certifying that Contractor is a certified Contractor in good standing with the manufacturer and is qualified to perform the specified work and able to receive the required warranties.
- I. Work History Certification: Contractor's recent work history data of successful warranted installations similar to that of this Project within the last 5 years.
- J. Performance Certification: Signed by technical representative of the roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" article.
1. Submit evidence of compliance with performance requirements.
- K. Certificates: By manufacturers of roofing and accessory materials that all materials supplied comply with all requirements of the identified ASTM and industry standards or practices.
- L. Test Reports: UL Class A Fire Resistance approval.
- M. For Warranty and Material Acceptance: Manufacturer will review the following:
1. Complete copy of project architectural specifications or roofing contractor's proposal outlining design parameters.
 2. Complete list of accessories or materials not manufactured or expressly authorized for use in manufacturer's literature.
 3. Dimensioned outline of the roof indicating all detail references.
 4. Dimensioned shop drawings illustrating non-manufacturer details. Details that do not conform with standard manufacturer details shall be returned with appropriate recommendations.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer and manufacturer.
- B. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - 1. Submit evidence of compliance with performance requirements.
- C. Installer's Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- D. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of membrane roofing system.
- E. Research/Evaluation Reports: For components of membrane roofing system, from the ICC-ES.
- F. Field quality-control reports.
- G. Warranties: Sample of special warranties.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing system to include in maintenance manuals.
- B. An annotated as-built roof plan showing the location of all seam weld test samples taken and their catalog numbers, slopes of crickets, insulation thickness, all roof penetrations locations including mechanical equipment, curbs, electrical, plumbing, and gutters.
- C. Full size record drawings set (as-builts).
- D. Manufacturer's technical representative's field quality-control reports.
- E. Operation and Maintenance Data.
- F. Warranty Documentation

1.6 EXTRA STOCK MATERIALS

- A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.
 - 1. Furnish one (1) full 10'-0" wide x 80'-0" long rolls of felt-backed roofing membrane.
 - 2. Furnish one (1) full 5'-0" wide x 100'-0" rolls of bare back roofing membrane.
 - 3. Furnish one (1) full 39" wide x 50'-0" long rolls of walkway pad.
 - 4. Furnish six (6), eleven (11) ounce tubes of sealant.

1.7 QUALITY ASSURANCE

- A. Perform work in accordance with NRCA Roofing and Waterproofing Manual and manufacturer's instructions.
- B. Installer Qualifications: A qualified firm with minimum 5 years documented experience that is trained and authorized by membrane roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.
- C. Source Limitations: Obtain components including roof insulation for membrane roofing system from same manufacturer as membrane roofing or approved by membrane roofing manufacturer.
- D. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.
- E. Fire-Resistance Ratings: Where indicated, provide fire-resistance-rated roof 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.
- F. Manufacturer Qualifications: Qualified manufacturer with staff available for the Project to provide site visits, with inspections and written reports, performed by a technical representative of the roofing membrane manufacturer at the intervals below. Contractor to coordinate manufacturer site visits and field reports.
 - 1. Pre-installation meeting.
 - 2. Final inspection for issuance of warranty by a technical representative employed by roofing system manufacturer specifically to inspect installation for warranty purposes.
 - 3. Contractor to submit copies of reports to the Consultant within seven (7) days of the site visit.
- G. Suitability of Contract Documents: Verify that the Contract Documents are workable and not in conflict with the manufacturers' recommendations and instructions prior to the start of the Work.
 - 1. Start of the Work constitutes acceptance of project conditions and requirements
- H. Thermoplastic membrane roofing and associated Work shall be in compliance with NRCA recommendations. Where requirements of the Contract Documents are more stringent, the more stringent shall apply.
- I. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project site.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 - 3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review deck substrate requirements for conditions and finishes, including flatness.
 - 5. Review structural loading limitations of roof deck during and after roofing.
 - 6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.

7. Review governing regulations and requirements for insurance and certificates if applicable.
 8. Review temporary protection requirements for roofing system during and after installation.
 9. Review roof observation and repair procedures after roofing installation.
 10. Review manufacturer's requirement to provide an engineering study, or Statement of Sound Roof Structure, to manufacturer, indicating that the structure is capable of accommodating additional live and dead loads including water retention.
 11. Review moisture conditions in existing roofs, new structural concrete or new lightweight insulating concrete that would impair or prohibit the desired performance of the new roof system.
- J. Preinstallation Roofing Conference: Conduct conference at Project site one week before starting the work of this section and after approval of a complete submittal.
1. Provide all applicable submittals 7 days prior to preinstallation meeting.
 2. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 3. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 4. Review testing and inspection requirements.
 5. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 6. Examine deck substrate conditions and finishes for compliance with requirements, including flatness.
 7. Review structural loading limitations of roof deck during and after roofing.
 8. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
 9. Review governing regulations and requirements for insurance and certificates if applicable.
 10. Review temporary protection requirements for roofing system during and after installation.
 11. Review roof observation and repair procedures after roofing installation.
- K. There shall be no deviations from approved contract specifications or shop drawings without prior written approval by the Owner/Owner representative and manufacturer. Unauthorized deviations may subject the roof system to warranty ineligibility.
1. Work found to be substandard or in violation of the contract documents or manufacturer's specifications shall be subject to rejection including complete removal and replacement with new materials at the expense of the Contractor.
 2. A quality assurance inspection of the roof system shall be performed by manufacturer for acceptance and approval. This inspection shall be performed upon completion and certification by the Contractor that the roofing system has reached 100 percent completion, a quality installation has been completed in accordance with the approved contract specifications, and all field welds have been probed and inspected.
 3. All field seams shall be visible and available to manufacturer at the time of final inspection.
- L. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
1. Intent of mock-up shall be to demonstrate quality of workmanship and visual appearance.
 2. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.

3. Retain mock-up during construction as a standard for comparison with completed work.
4. Do not alter or remove mock-up until work is completed or removal is authorized.

1.8 REGULATORY REQUIREMENTS

- A. Conform to current California Building Code for roof assembly, fire hazard requirements and balance of requirements on the Project.
- B. Conform to applicable City, County, State, and Federal requirements.
- C. The Contractor shall submit evidence that the proposed roof system meets the requirements of the local building code and has been tested and approved or listed by the following test organizations. These requirements are minimum standards and no roofing work shall commence without written documentation of the system's compliance.
 1. American Society of Civil Engineers – ASCE 7; Current Edition.
 2. Underwriters Laboratories, Inc. - Northbrook, IL: Class A assembly.
- D. Conform to the requirements of the following regulatory agencies:
 1. Bay Area Air Quality Management District
 2. OSHA.
 3. EPA.
 4. Local City and County Authorities.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.
- E. Store rolled goods on ends only, unless otherwise required by manufacturer's written instructions. Discard rolls that have been flattened, creased, or otherwise damaged.
- F. Do not store materials at locations where new roofing materials have been installed.

1.10 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.
1. Do not install if wind is gusting more than 15 miles per hour or interferes with proper installation.
 2. Do not apply roofing membrane when ambient temperature is below 40°F or above 95°F.
 3. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
 4. Do not apply waterborne adhesives if the ambient air temperature is expected to drop below 32 degrees F within 72 hours of application.
 5. The use of polystyrene insulation and coverboard assemblies for adhered roofing systems incorporating solvent borne adhesives shall also include a minimum 10-mil polyethylene solvent barrier between the insulation and coverboard.
 6. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.
- B. Only as much of the roofing as can be made weathertight each day, including all flashing and detail work, shall be installed. All seams, including flashings, shall be cleaned and heat-welded before leaving the job site that day.
- C. All work shall be scheduled and executed without exposing the interior building areas to the effects of inclement weather. The existing building and its contents shall be protected against all risks.
- D. All surfaces to receive new materials shall be dry. Should surface moisture occur, the Contractor shall provide the necessary equipment to dry the surface prior to application. Do not apply roofing to damp or wet substrate.
- E. All new and temporary construction, including equipment and accessories, shall be secured in such a manner as to preclude wind blow-off and subsequent roof or equipment damage.
- F. Uninterrupted waterstops shall be installed at the end of each day's work, regardless of forecasted weather, and shall be completely removed before proceeding with the next day's work. Waterstops shall not emit dangerous or unsafe fumes and shall not remain in contact with the finished roof as the installation progresses. Contaminated membrane shall be replaced at no cost to the Owner.
- G. Certain membranes are incompatible with asphalt, coal tar, heavy oils, roofing cements, creosote and some preservative materials. Such materials shall not remain in contact with the specified membrane. The Contractor shall consult the manufacturer regarding compatibility, precautions, and recommendations.
- H. Arrange work sequence to avoid use of newly constructed roofing as a walking surface or for equipment movement and storage. Where such access is absolutely required, the Contractor shall provide all necessary protection and barriers to segregate the work area and to prevent damage to adjacent areas. A substantial protection layer consisting of plywood over membrane or plywood over insulation board shall be provided for all new and existing roof areas which receive rooftop traffic during construction.

- I. Prior to and during application, all dirt, debris and dust shall be removed from surfaces by methods approved by the manufacturer
- J. Fastener pull-out resistance tests performed by the manufacturer's technical representative. Testing shall be performed on walls and in the field of the roof. The Contractor shall coordinate fastener pullout tests in accordance with the latest revision of the ANSI SPRI FX-1 2016 "Standard Field Test Procedure for Determining the Withdrawal Resistance of Roofing Fasteners" to verify condition of deck/substrate and to confirm expected pullout values. Notify Consultant immediately if values do not comply.
 - 1. Testing shall be performed for all fastener types to be used in conjunction with the roofing installation.
- K. Adhesion tests performed by the manufacturer's technical representative. Testing shall be performed in the field of the roof. The Contractor shall coordinate adhesion tests in accordance with the latest revision of the ANSI SPRI 1A-1 2015 "Standard Field Test Procedure for Determining the Uplift Resistance of Insulation and Insulation Adhesive Combinations over Various Substrates" to verify condition of deck/substrate and to confirm expected adhesion values. Notify Consultant immediately if values do not comply.
 - 1. Assembly to be tested shall include cover board adhered to flatstock insulation adhered to vapor retarder membrane adhered to thermal barrier board mechanically attached to metal deck substrate.
 - 2. Repairs to test areas will be performed at no additional cost to the Owner.
 - 3. Supplemental locations will be required in instances where initial adhesion testing fails.
 - 4. Where adhesion testing indicates improper adhesion performance:
 - a. Provide additional preparation of substrates.
 - b. Provide primer(s) over substrates.
 - c. Others, as required to ensure proper adhesion.
- L. Coordinate the work with installation of associated counterflashings installed by other sections as the work of this section proceeds.

1.11 WARRANTY

- A. Special Warranty: Manufacturer's standard or customized form, without monetary limitation, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period.
 - 1. Special warranty includes membrane roofing, base flashings, roof insulation, cover boards, roofing accessories, and other components of membrane roofing system.
 - 2. Warranty Period: 20 years NDJ from date of Substantial Completion.
 - 3. Warranty shall include coverage for areas of ponding water.
- B. Installer Warranty: Installer's workmanship warranty in which installer agrees to repair or replace components of membrane roofing system including, but not limited to, roofing, flashing or metal, that fail in materials or workmanship within the specified warranty period. Repair or replacement shall also include thermal barrier board, insulation, substrate board, and accessory products.
 - 1. Warranty Period: Five (5) years from date of Substantial Completion.
 - 2. Warranty shall include all corrective actions necessary to repair damage to the roof membrane and components caused by roof leaks or improper application.
 - 3. Warranty shall cover leaks from failure to resist penetration of water during construction.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed membrane roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and base flashings shall remain watertight.
1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.
 2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D3746 or ASTM D4272.
 3. Wind Uplift Resistance: Design roofing system to assist the following wind uplift pressures when tested according to FM Approvals 4474, UL 580, or UL 1897:
 - a. **Positive Wind Loads (All Zones: 1,2, 3) = _____ PSF**
 - b. **Negative Wind Loads:**
 - 1) **Zone 1 = _____ PSF**
 - 2) **Zone 2 (Edges) = _____ PSF**
 - 3) **Zone 3 (Corners) = _____ PSF**
- B. Fastener pull-out resistance tests performed by the manufacturer's technical representative. Testing shall be performed on walls and in the field of the roof. Coordinate with the manufacturer's tech rep.
- C. Adhesion tests performed by the manufacturer's technical representative. Testing shall be performed in the field of the roof. Coordinate with manufacturer's technical representative.
- D. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.
- E. Roofing System Design: Provide membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE/SEI 7.
- F. Energy Performance: Provide roofing system with initial solar reflectance not less than 0.80 and emissivity not less than 0.75 when tested according to CRRC-1.
- G. Provide low-sloped roofs and assemblies (with slope less than 2:12) that have a Class A fire rating per ASTM E108 or UL 790.
- H. FM Approvals Listing: Provide membrane roofing, base flashings, and component materials that comply with requirements in FM Approvals 4450 and FM Approvals 4470 as part of a membrane roofing system, and that are listed in FM Approvals' "RoofNav" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Approvals markings.
1. **Fire/Windstorm Classification: Class 1A-90.**

2.2 SINGLE PLY MEMBRANE ROOFING

- A. Products: Subject to compliance with requirements, provide the following or equal:
 - 1. Basis-of-Design: Sika-Sarnafil "Sarnafil Energy G410-60 Feltback EnergySmart".
 - a. Thickness: 60 mils, nominal.
 - b. Exposed Face Color: As selected by Architect from manufacturer's standards.
- B. Cool Roof Requirements: Provide roof system that has a solar reflectance per the Cool Roof Rating Council.

2.3 AUXILIARY MEMBRANE ROOFING MATERIALS

- A. General: Auxiliary membrane roofing materials recommended by roofing system manufacturer for intended use, and compatible with membrane roofing.
 - 1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- B. Vapor Retarder: Sika-Sarnafil "Vapor Retarder SA-106".
- C. Sheet Flashing: Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as sheet membrane.
- D. Bonding Adhesive: Manufacturer's standard, water based.
- E. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8-inch thick; with anchors.
- F. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.
- G. Membrane Clad Metal: Manufacturer's G90 hot dip galvanized steel with manufacturer's thermoplastic membrane laminated on one side.
 - 1. G90 Galvanized Steel: 24 gauge
 - 2. 20 mil unreinforced membrane laminated on one side.
 - 3. Color: Match membrane roofing.
- H. Bonding Adhesive for Horizontal Membrane Securement
 - 1. Sika Sarnafil "Sarnacol 2121".
- I. Bonding Adhesive for Vertical Membrane Securement
 - 1. Sika Sarnafil "Stabond U-148A".
- J. Sealant
 - 1. Sika Sarnafil "Sikaflex 1a".
- K. Vapor/Air Barrier: Self-adhesive vapor/air barrier.
 - 1. Sika Sarnafil "SA-106".
- L. Vapor/Air Barrier Primer: Water-based primer for self-adhesive vapor/air barrier.

1. Sika Sarnafil "Vapor Retarder Adhesive CA SB".
- M. Vapor/Air Barrier Mastic
 1. Sika Sarnafil "Mastic TG".
- N. Membrane Cleaner
 1. Sika Sarnafil: Manufacturers approved cleaners – Refer to Sarnafil Roofing Technical Bulletin #02-13 for acceptable products.
- O. Termination Bar
 1. Sika Sarnafil "Sarnabar", 14-gauge galvanized steel.
- P. Hose Clamp: 100 percent type 316 stainless steel wormgear clamp.
- Q. Membrane Fasteners and Plates including Fasteners used with Termination Bars
 1. Sika Sarnafil "Sarnafastener – #15 XP" and "Sarnadisc – XPN".
 2. Fibertite "FTR Magnum Fasteners" and "FTR Magnum-R Stress Plates (round plate)".
- R. Fasteners for Membrane Clad Metal: Hot-dip galvanized ring shank nails by Maze Nails or equal. Length sufficient to provide minimum 1-1/4-inch embedment or 3/4-inch past underside of sheathing.
- S. Pipe/Conduit Supports
 1. Erico Pyramid Caddy Supports
 2. Dura-Blok Roof Top Supports
- T. Membrane Walkway Pads
 1. Sika Sarnafil "Sarnatred-V".
 2. Fibertite "Tuff-Trac Protection Material".
- U. Liquid Flashing: Manufacturer or recommended by membrane manufacturer.
 1. Sika Sarnafil:
 - a. "Liquid Flashing".
 - b. Liquid Flashing Fleece
 - c. Liquid Flashing Catalyst
 2. Fibertite:
 - a. Forti-Lock Liquid Flashing
 - b. Forti-Lock Fleece
 - c. Forti-Lock Catalyst

2.4 ROOF INSULATION

- A. General: Preformed roof insulation boards manufactured or approved by membrane roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated and that produce FM Approvals-approved roof insulation. Provide where indicated on Drawings.
- B. Membrane Cleaner: Manufacturer's approved acetone cleaner.
- C. Hose Clamp for Penetrations: 100% Type 316 stainless steel Wormgear.
- D. Round Plate Fasteners: FTR Magnum Fasteners and FTR Magnum-R Stress Plates.

- E. Fasteners for Membrane Clad Metal: Hot-dip galvanized ring shank nails by Maze Nails or equal. Length sufficient to provide minimum 1-1/4-inch embedment or 3/4-inch past underside of sheathing.
- F. Insulation: 20psi, rigid closed cell polyisocyanurate, thickness as determined by energy consultant.
 - 1. Basis-of-Design: Sika-Sarnafil "Sarnatherm CG".
- G. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope shown as required to achieve positive slope to drain.
- H. Gypsum Core Cover Board (ASTM C473): Georgia-Pacific Gypsum LLC "DensDeck Prime".
 - 1. Thickness: 1/2 inch.
- I. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.
- J. Foam Adhesive: Primary roofing system manufacturer's standard foam adhesive for bonding rigid insulation board to the substrate and to other insulation and substrate board to insulation.
 - 1. Sarnacol AD Board Adhesive; Sika Sarnafil
- K. Plates and Fasteners: Primary roofing system manufacturer's standard insulation plates and fasteners for securing thermal barrier board to the metal deck substrate.
 - 1. Plates:
 - a. Sarnaplate; Sika Sarnafil
 - b. 3" Round or 3" Square acceptable for use.
 - 2. Fasteners:
 - a. Sarnafastener #12; Sika Sarnafil b.1-5/8" long
- L. Fasteners for Vertical Substrates: Fasteners to secure cover board to vertical curbs and walls shall be approved cover board fasteners as recommended and approved by the cover board manufacturer for wall material type.
 - 1. Concrete: Fastener CD-10; Sika Sarnafil
 - 2. Metal: Sarnafastener #12; Sika Sarnafil
 - 3. Wood: Sarnafastener #12; Sika Sarnafil

2.5 INSULATION ACCESSORIES

- A. General: Furnish roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with membrane roofing.
- B. Full-Spread Applied Insulation Adhesive:
 - 1. Listed and approved by Factory Mutual Research in conjunction with specified insulation and substrate.
 - 2. Meet minimum roofing system design requirements, evidenced by testing in conjunction with the proposed substrate and or composite.
 - a. Testing to be performed under FM-Global requirements or acceptable third-party laboratory.
 - 3. Provide written specifications regarding the safe handling, storage, and surface preparation for a quality application of the product.

2.6 WALKWAY PADS

- A. Flexible Walkways: Sika-Sarnafil "Sarnatred V". Use as a protection layer from rooftop traffic.
- B. High Performance Walkways: Crossgrip 9/16-inch flexible PVC, installed over membrane with loops, heat-welded to the roof membrane. Use at access openings, perimeter of equipment, and other maintenance areas as shown on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
 - 1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
 - 2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 - 3. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.
 - 4. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
 - 5. Verify that concrete curing compounds that will impair adhesion of roofing components to roof deck have been removed.
 - 6. Verify that concrete deck is clean and smooth, flat, free of depressions, wave, or projections, properly sloped and suitable for installation of roof system.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Fastener Pull-out Tests: Perform pull-out tests to determine appropriate rate and type of fastener installation in presence of manufacturer's technical representative.
- D. Adhesion Tests: Perform pull-out tests to determine appropriate rate and pattern of adhesive installation in presence of manufacturer's technical representative.

3.2 PREPARATION

- A. Decking shall be installed to provide positive slope and subsequent positive drainage of the new roofing systems.
- B. Finished decking shall be properly cured and dried prior to the installation of approved insulation.
- C. Finished surfaces to receive new roof system shall be smooth and level without significant surface depressions or irregularities. Camber differentials greater than 3/16 inch must be leveled using a cementitious grout.

- D. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- E. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- F. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.3 WOOD NAILERS

- A. Install treated lumber at same heights as insulation layer or adjacent construction plus or minus 0.25 inch (6 mm). Install continuous treated wood nailers at all perimeters, around roof projections and penetrations as shown in approved details.
- B. Wood Nailers Installed Directly on the Substrate: Carefully examine substrates to confirm the entire area provides a suitable fastening surface. Repair defects by appropriate trades prior to installation.
- C. Nailers (WxH): 3.5 x 1.5 inches. Installed and anchored in such a manner to resist a force of 250 lbs per linear foot of wood blocking in any direction.
- D. Nailers along parapets, curbs and expansion joints are recommended for insulated decking. Contact manufacturer for optional and alternate membrane termination and securement methods.

3.4 INSTALLATION OF VAPOR BARRIER

- A. Install vapor/air barrier primer and membrane over a clean and dry substrate. Do not install when it is raining, snowing, or on wet/humid surfaces.
- B. Apply primer prior to installing air/vapor barrier membrane.
 - 1. Mix primer well before use. Do not dilute.
 - 2. Minimum ambient and surface application temperature is 14° F and rising.
 - 3. Apply primer with a brush or roller
 - a. Application Rate Porous Substrate: 104 -208 sf / gallon.
 - b. Application Rate Porous Substrate: 166 -416 sf / gallon.
 - 4. Allow primer to dry completely before installing vapor/air barrier membrane.
- C. Begin application of vapor/air barrier membrane at the bottom of the slope. Chalk a line on the substrate to align the sheet.
- D. Unroll, position, and align the vapor/air barrier membrane with the release liner covered selvage edge on the up-slope side. After the sheet is placed in its final position, loosely reroll half the sheet toward the center of the roll.

- E. Carefully score the release liner across the width of the roll with a straight blade utility knife. Roll vapor/air barrier membrane into its final position as the release liner is being removed. Re-roll the remaining vapor/air barrier membrane and repeat the process.
- F. Roll vapor/air barrier membrane with a 100 lb steel roller to ensure full contact with the substrate. Finish by aligning the edge of the roller with the lower end of the side laps and rolling up the membrane. Do not cut the membrane to remove air bubbles trapped under the laps. Squeeze out air bubbles by pushing the roller to the edge of the laps.
- G. Align successive sheets with 3" side laps and 6" end laps. The side lap seam area has a pre-applied primer/adhesive on one side for mating with the bottom of the next sheet. Remove the release liner from the seam area and mate the top sheet to the bottom. Roll the seam area to ensure full contact. Hot air weld the end laps. Hot air welded laps must show a minimum 1/2" bleed out.
- H. Stagger adjacent end laps a minimum of 12".
- I. Apply mastic to seal around penetrations. Use a trowel to mound mastic around the penetrations to seal the opening. Do not apply mastic where it may come into direct contact with the PVC membrane.

3.5 INSULATION INSTALLATION

- A. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system and insulation manufacturer's written instructions for installing roof insulation.
- C. Insulation Boards: Adhered in approved adhesives, maximum 4 feet x 4 feet. Install tapered insulation under area of roofing to conform to slopes indicated.
 - 1. Taper roof insulation to drain sumps using tapered edge strips.
 - a. If insulation layer is 1.5 inches or less, taper 12 inches from drain bowl.
 - b. If insulation thickness exceeds 1.5 inches, taper 18 inches from drain bowl.
 - c. Taper boards or pieces must be adhered or mechanically fastened with a minimum of two fasteners per board.
- D. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 12 inches in each direction.
 - 1. Where installing composite and noncomposite insulation in two or more layers, install noncomposite board insulation for bottom layer and intermediate layers, if applicable, and install composite board insulation for top layer.
- E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

3.6 INSTALLATION OF INSULATION AND COVER BOARD

- A. Adhere rigid insulation board and cover board to vapor/air barrier membrane.

1. Secure with 1/2" to 3/4" wide beads of foam adhesive in a ribbon pattern, minimum spacing to be as indicated below. If fastening pattern set by manufacturer or necessary to meet FM 1-90/ ASCE 07-16 wind uplift requirements exceeds those of this section, the more stringent fastening requirements are to be followed. Fastening pattern to be increased in corners and perimeters per the requirements of FM Global/ASCE 07-16.
 - a. Field = 12 inch centers
 - b. Perimeters = 6 inch centers
 - c. Corners = 4 inch centers
 2. Allow foam adhesive to begin rising and place the boards into the adhesive before the adhesive has skinned over.
 3. Walk boards in, and place heavy ballast to hold boards in place while curing to eliminate uneven surfaces and ensure positive contact between the boards, adhesive and substrate.
 4. Adhesive open time varies depending on weather conditions.
- B. Crickets: Install crickets before application of cover board, at the high side of all curbs or other obstacles 24" or wider blocking positive drainage to roof drains or scuppers, and at locations indicated
1. Carefully layout each cricket to ensure positive roof drainage and no possibility of roof ponding.
 2. Crickets shall smoothly transition between changes in slope.
- C. Mechanically attach cover board at vertical applications
1. Fasten through cover board with non-corrosive screws, minimum spacing to be as indicated below.
 - a. 12" o.c. horizontally, top and bottom.
 - b. 8" o.c. vertically at every 16" o.c. horizontally.
- D. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 12-inches in each direction. Loosely butt cover boards together.
1. Adhere cover boards to resist uplift pressure at corners, perimeter, and field of roof.
 2. Extend materials to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids greater than 1/8-inch in width with same material. Remove projections that interfere with proper placement.
 3. Walk boards into place to ensure full contact with adhesive. Continue to walk boards in place until adhesive has set.
 4. Adhered in approved adhesives, maximum 4 feet x 8 feet.
- 3.7 PROTECTION OF APPLIED INSULATION AND COVER BOARD
- A. Completely cover applied materials with finished roofing system. Protect open spaces between insulation and cover board and walls and spaces at curbs, until permanent roofing and flashing is applied. Insulation and cover board may not be left uncovered overnight.
- B. In finished areas, storing walking, wheeling or trucking will not be permitted. Provide smooth, clean board or plank walkways, runways, and platforms near supports, as necessary to distribute weight to conform to indicated live load limits or roof construction.
- 3.8 ADHERED MEMBRANE ROOFING INSTALLATION
- A. Quality Control:

1. It is the responsibility of the roofing contractor to initiate and maintain a Quality Control program to govern all aspects of the installation.
 2. The project foreman and or supervisor will be responsible for the daily execution of the Quality Control program which will include but is not limited to the supervision, inspection and probing of all heat welded seams incorporated within roofing system.
 3. If inconsistencies in quality of the application of the composite, membrane or welds are found, work shall cease until corrective actions are taken to ensure the continuity the installation.
- B. General:
1. Coordinate work ensuring that sequencing of installation promotes a 100 percent watertight installation at the end of each day.
 2. Roofing systems to be designed utilizing and determined to be in compliance with the procedures outlined within the current publication of ASCE Standard 7. Alternative designs may be determined using the criteria within Factory Mutual Research Loss Prevention Data.
 3. Roofing system may utilize either conventional roll goods or custom prewelded panel rolls or a combination of both.
 4. Restrictions regarding outside ambient air temperature are relative only to the exposure limits of the workers or adhesives when necessary.
 5. When using adhesives outside ambient air temperature shall be above 40 degrees F and rising. Curing or drying time of the adhesive will be affected by ambient temperatures and must be taken into consideration.
 6. Humidity can affect the drying time of solvent borne adhesives or cause condensation to form on the newly applied adhesive.
 7. No moisture may be present on the adhesives prior to mating or application of membranes.
 8. Adhered membrane systems are to be broomed in place first and then completed by pressing the membrane into the adhesive with a weighted, foam covered lawn roller or 50 lb linoleum roller. Lawn rollers should be filled with between 6 and 8 gallons of water.
 9. Roofing systems shall only be installed over properly prepared and sound substrates, free from excessive surface roughness, dirt, debris, and moisture.
- C. Adhere membrane roofing over area to receive roofing and install according to membrane roofing system manufacturer's written instructions.
1. Install sheet according to ASTM D 5036.
- D. Start installation of membrane roofing in presence of membrane roofing system manufacturer's technical personnel.
- E. Accurately align membrane roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- F. Bonding Adhesive: Apply to substrate and underside of membrane roofing at rate required by manufacturer. Do not apply to splice area of membrane roofing.
1. Apply roof membrane into the wet adhesive. Do not allow adhesive to skin over or surface-dry prior to installation of membrane.
- G. Apply membrane roofing with side laps shingled with slope of roof deck where possible.
- H. Seams: Clean seam areas, overlap membrane roofing, and hot-air weld side and end laps of membrane roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation.

1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet membrane.
 2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
 3. Repair tears, voids, and lapped seams in roofing that does not comply with requirements.
 4. Weld coverstrips at all seams that do not have a factory selvage edge.
 5. Complete all seams by end of day.
 6. T-Joints (three-way overlaps): When welding a three-way overlap, the top edge of the second sheet shall be shaved down to create a smooth transition for the top membrane layer to conform to for welding. Chamfer the edge of the membrane.
- I. Spread sealant bed over deck drain flange at roof drains and securely seal membrane roofing in place with clamping ring.
1. Solidly coat drain bowl flange with sealant and detail per manufacturer's requirements.
- J. Install Termination Stop around all square penetrations including equipment curbs, and Termination Disc around all round penetrations including drains, pipes, standoffs, and any other membrane terminations within the field.
1. Fasten in accordance with Manufacturer's requirements at a minimum of 4 inches o.c.
- K. Install Termination Bars and termination reinforcement at membrane perimeters at parapet walls.
1. Fasten in accordance with Manufacturer's requirements at a minimum of 12 inches o.c.

3.9 HOT-AIR WELDING OF LAP AREAS

- A. General:
1. Adjacent sheets shall be welded in accordance with manufacturer's instructions. All side and end lap joints shall be hot-air welded. Lap area shall be a minimum of 3 in. wide when machine welding, and a minimum of 4 in. wide when hand welding. Overlaps shall be with the flow of water where possible.
 2. At laps without selvage edge, weld membrane cover strips over laps.
 3. Welding equipment shall be provided by or approved by manufacturer. All mechanics intending to use the equipment shall have successfully completed a course of instruction provided by a manufacturer's representative prior to welding.
 4. All surfaces to be welded shall be clean and dry according to manufacturer's instructions. No adhesives shall be present within lap areas.
- B. Hot Air Hand Welding:
1. The lap or seam area of the membrane may be intermittently tack welded to hold the membrane in place.
 2. The back interior edge of the membrane shall be welded first, with a thin, continuous weld to concentrate heat along the exterior edge of the lap during the final welding pass.
 3. The nozzle of the hand held hot air welder shall be inserted into the lap at a 45 degree angle to the lap. Once the polymer on the material begins to flow, a hand roller shall be use to apply pressure at a right angle to the tip of the hand welder. Properly welded seams shall utilize a 1-1/2 inch wide nozzle, to create a homogeneous weld, a minimum of 1-1/2 inch in width.
 4. Smaller nozzles may be used for corners, and other field detailing, maintaining a minimum 1-inch weld.
- C. Automatic Hot Air Machine Welding:
1. Proper welding of the membrane can be achieved with a variety of automatic welding equipment.

2. Follow all manufacturers' instructions for the safe operation of the automatic welder.
3. Follow local code requirements for electric supply, grounding and surge protection.
4. The use of a dedicated, portable generator is highly recommended to ensure a consistent electrical supply, without fluctuations that can interfere with weld consistency.
5. Properly welded seams shall utilize a 1-1/2 inch wide nozzle, to create a homogeneous weld, a minimum of 1-1/2 inch in width.

D. Inspection:

1. The job foreman or supervisor shall initiate daily inspections of all completed work which shall include, but is not limited to the probing of all field welding with a dull pointed instrument to assure the quality of the application and ensure that any equipment or operator deficiencies are immediately resolved.
2. Ensure all aspects of installation (sheet layout, attachment, welding, flashing details, etc.) are in strict accordance with the manufacturer's most current specifications and details.
3. Excessive patching of field seams because of inexperienced or poor workmanship will not be accepted at time of Final Inspection for Warranty Acceptance.
4. Any deviation from pre-approved specifications or details requires written authorization from the manufacturer prior to application to avoid any warranty disqualification.
5. It is the Contractor, job foreman, supervisor, or quality control personnel's responsibility to perform a final self-inspection on all seams prior to requesting the inspection for warranty issuance by the manufacturer.

3.10 QUALITY CONTROL OF WELDED SEAMS

- A. The Contractor shall check all welded seams daily for continuity using an approved probing tool. Contractor shall probe all seams and make necessary repairs.
- B. Visible evidence that welding is proceeding correctly is smoke during the welding operation, shiny membrane surfaces, and an uninterrupted flow of dark gray material from the underside of the top membrane.
- C. On-site evaluation of welded seams shall be made daily by the Contractor at locations as directed by the Consultant, Owner or manufacturer's representative.
- D. A minimum of one inch wide cross-section samples of welded seams shall be taken at least three times a day. Contractor shall tack weld physical sample over patch and date patch/sample with permanent marker. Contractor will maintain a running catalogue and roof plan with daily test locations identified and tracked.
- E. Correct welds display failure from shearing of the membrane prior to separation of the weld.
- F. The Consultant may take seam cut test samples randomly during application. The Contractor shall fully cooperate and repair test samples and identified deficiencies promptly at no additional cost to Owner.

3.11 BASE FLASHING INSTALLATION

- A. Clean vents, pipes, conduits, tubes, walls, and stacks to bare metal. Protrusions must be properly secured to roof deck with approved fasteners. Remove and discard lead, pipes and drain flashing. Flash penetrations according to approved details.
- B. Remove loose or deteriorated cant strips and flashings.

- C. All flashings shall be installed concurrently with the roof membrane as the job progresses. All membrane shall be fully welded each day.
- D. No temporary flashings shall be allowed without the prior written approval of the Consultant and manufacturer. Approval shall only be for specific locations on specific dates. If any water is allowed to enter under the newly completed roofing, the affected area shall be removed and replaced at the Contractor's expense. Flashing shall be adhered to compatible, dry, smooth, and solvent-resistant surfaces. Use caution to ensure adhesive fumes are not drawn into the building.
- E. All flashing shall be adhered to properly prepared, approved substrates with adhesive or mastic applied in sufficient quantity to ensure total adhesion.
- F. All flashings shall be installed concurrently with the roof membrane in order to maintain a watertight condition as the work progresses.
- G. Apply bonding adhesive per manufacturer's instructions. Adhesive shall be applied in smooth, even coats with no gaps, globs or similar inconsistencies. Do not apply to seam area of flashing.
- H. Refer to detail drawings for flashing work. Comply with manufacturer requirements if more stringent.
- I. Provide enhanced securement of the membrane at the base of parapets, walls, curbs, penetrations, and drains. Refer to detail drawings.
- J. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- K. Terminate and seal top of membrane flashings and mechanically anchor to substrate through termination bars fastened at 6 inches on center.
 - 1. Coordinate flashing with counterflashing/coping installation.
- L. Terminate and seal top of penetration flashings with stainless steel wormgear clamp and sealant.
 - 1. Coordinate flashing with membrane umbrella installation complete with stainless steel Wormgear clamp and sealant.
- M. All flashings shall extend a minimum of 8 inches above roofing level. All flashings that exceed 30 inches in height shall receive additional securement. See Contract Drawings for additional securement requirements.

3.12 METAL FLASHING

- A. All perimeter edge details are to be fabricated from manufacturer's clad metal or utilize a prefabricated fascia system.
- B. Ensure all fascia extends a minimum of 2 inches lower than the bottom of the wood nailers.
- C. Fasten all metal flashing to wood nailers or approved substrate with approved fasteners 8 inches on center.

- D. Solidly weld expansion joints with a 6-inch strip of membrane welded to the clad metal, covering the bond breaker tape.

3.13 LIQUID FLASHING INSTALLATION

- A. Install and mix liquid flashing in accordance with manufacturer's written recommendations.
- B. Ensure all surfaces are clean, dry, free of dirt, dust, debris, loose particles, loose paint, rust and other contaminants.
- C. Clean new roofing membrane with mineral spirits or all-purpose cleaner.
- D. Clean metal surfaces to near white metal in accordance with SSPC-SP3 (power tool clean).
- E. Extend surface preparation a minimum of 1/8 inch beyond the termination of the flashing.
- F. Mixing:
 - 1. Thoroughly mix entire container of liquid flashing with slow-speed (200-400 rpm) electric drill with mixing paddle for two minutes.
 - 2. Add catalyst at manufacturer's recommended rate and mix with slow-speed electric drill for another two minutes.
 - 3. Apply liquid flashing within 5-10 minutes.
- G. Apply minimum 55-mils liquid flashing to clean prepared surface with a 1/2-inch nap roller with rounded edges.
- H. Embed fleece into wet liquid membrane and use roller to eliminate wrinkles and air bubbles while completely saturating fleece. Apply additional liquid flashing at overlap between fleece layers.
- I. Apply additional 25-mils of liquid flashing and ensure fleece is fully saturated.
- J. Ensure total membrane thickness including fleece is 115-mils minimum.

3.14 ROOF DRAINS:

- A. Flash all roof drains in accordance with manufacturer's roof drain details.

3.15 EXPANSION JOINTS

- A. Flash all expansion joints in accordance with authorized details. Fasten all expansion joint material according to manufacturer's specifications. Ensure the expansion material has sufficient material to expand to the widest point in expansion without causing undue stress on the expansion joint material.
- B. If the expansion joint is a preformed system, the manufacturer, description and a drawing illustrating the method of installation must be included when the (FTR-PIN) is submitted.

3.16 SEALANTS

- A. Apply authorized sealants to all surface mounted reglets and per project requirements. Sealants are to shed water. Follow all manufacturer's instructions and installation guides.
- B. Use primer when recommended by the manufacturer.
- C. Sealants will require periodic maintenance by the building Owner's maintenance personnel.

3.17 TEMPORARY SEALS

- A. At the end of each working day or at the sign of rain, install temporary, 100 percent watertight seals where the completed new roofing adjoins the uncovered deck or existing roof surface.
- B. The authorized roofing Contractor shall create and maintain the temporary seal in such a manner to prevent water from traveling beneath the new or existing roof system.
- C. The use of plastic roofing cement is permissible when sealing to an existing built-up roof.
- D. If water is allowed to enter beneath the newly completed roofing, the affected areas shall be removed and replaced at no additional expense to the building Owner.
- E. Prior to the commencement of work, cut out and remove all contaminated membrane, insulation, roof cement or sealant and properly dispose of offsite.

3.18 WALKWAY PAD INSTALLATION

- A. Install walkway pads in accordance with manufacturer's written instructions and recommendations. Install where indicated on the Contract Drawings
- B. Roofing membrane to receive walkway membrane shall be clean and dry.
- C. Place chalk lines on deck sheet to indicate location of walkway.
- D. Inspect all existing deck membrane seams that are to be covered by Walkway with probing tool and re-weld any inconsistencies before Walkway installation
 - 1. Area to receive walkway protection membrane shall be reviewed and approved by the Consultant and manufacturer prior to the installation of the walkway pad.
- E. Clean the deck membrane in areas to be welded.
- F. Provide 4-inch gap between walkway sections and between walkway and roof mounted items.
- G. Fully weld perimeter walkway.

3.19 METAL FLASHINGS

- A. Complete all metal work in conjunction with waterproofing and flashings so that a watertight

condition exists daily.

- B. Metal shall be installed to provide adequate resistance to bending and allow for normal thermal expansion and contraction.
- C. Metal joints shall be watertight.
- D. Metal flashings shall have a 4 inches minimum nailing flange and shall be fastened into substrate with fasteners of the same type with two rows of fastener, 4 inches o.c. staggered into concrete with acceptable concrete anchors 6 inches o.c. staggered. Fasteners shall penetrate into substrate a minimum of 1-1/4 inches.
- E. Adjacent sheets of PVC coated metal shall be spaced 1/4 inch apart. The end joints of the metal shall be fastened 6 inches o.c. Joints shall be covered with 1- inch wide aluminum tape. A 4-inch wide membrane flashing strip shall be hot air welded over the joint.

3.20 TEMPORARY CUT-OFF

- A. All temporary waterstops shall be constructed to provide a 100 percent watertight seal.
- B. The waterstop shall be sealed to the (e) roofing that water will not be allowed to travel under the new or existing roofing.
- C. If inclement weather occurs while a temporary waterstop is in place, the Contractor shall provide the labor necessary to monitor the situation to maintain a watertight condition
- D. The edge of the membrane shall be sealed in a continuous heavy application of manufacturer approved sealant.
- E. When work resumes, the contaminated membrane shall be cut out. All sealant, contaminated membrane, insulation fillers and other components of waterstop shall be removed from the work area and properly disposed of off-site. None of these materials shall be used in the new work.
- F. If any water is allowed to enter under the newly-completed roofing, the affected area shall be removed and replaced at the Contractor's expense.

3.21 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified 3rd party testing agency to perform tests and inspections.
- B. Conduct 72-hour flood tests around roof drains and scuppers according to ASTM D5957 (modified).
- C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.
- D. Repair or remove and replace components of membrane roofing system where inspections indicate that they do not comply with specified requirements.
- E. Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.22 COMPLETION

- A. Remove any and all debris, excess materials and scrap of any kind from the roof and surrounding premises prior to demobilization.
- B. Inspect all field welds, detailing and terminations to ensure a 100 percent the watertight installation.

3.23 PROTECTING AND CLEANING

- A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements; repair substrates; and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.
- D. Repair or replace components of roofing system and finished surfaces damaged or defaced due to the Work of this Project; comply with recommendations of manufacturers of components and surfaces.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional Work with specified requirements.
- F. Prior to final inspection, Contractor shall clean the roof membrane to permit inspection of all seams. Cleaning shall remove all surface containments.
- G. Contractor is responsible for the cleaning and removal of all debris or residue that is tracked from existing roof areas to the installed thermoplastic membrane.

3.24 FINAL INSPECTION FOR WARRANTY

- A. Upon completion of the project, the authorized roofing contractor shall complete and submit the projection completion notice to the manufacturer.
- B. Upon receipt of the notice of completion, a manufacturer's representative will schedule an inspection with a representative of the authorized roofing contractor to thoroughly review the installation and verify compliance with the roofing manufacturer's specifications.
- C. Any corrections or modifications necessary for compliance with the specifications and acceptance for warranty (punch list) will be noted on the Final Inspection for Warranty Form.
- D. Upon completion of all punch list items and final acceptance of the installation, a warranty as authorized by the manufacturer's Pre-Installation Notice will be issued.

HGA
PROJECT # 4952-002

06/05/2024
DSA SPC_V2

BUILDING 3000
MAINTENANCE OPERATIONS
WAREHOUSE & GARAGE
DSA 01-121159

END OF SECTION

SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Sheet metal flashing and trim.

- B. Related Sections:

- 1. Section 072500 "Weather Barriers"
- 2. Section 075419 "Single Ply Roofing."
- 3. Section 079200 "Joint Sealants".

1.3 COORDINATION

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: A preinstallation meeting shall be held at the project site prior to commencement of field installation to establish procedures to maintain required working conditions and to coordinate this Work with related and adjacent Work. Verify that final details comply with current recommendations published in SMACNA's "Architectural Sheet Metal Manual" and NRCA's Roofing and Waterproofing Manual. Meeting attendees shall include representatives for the Owner, Consultant, inspection firm, Contractor, sheet metal contractor and installers of related and adjacent Work.

- 1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
- 2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
- 3. Review requirements for insurance and certificates if applicable.
- 4. Review sheet metal flashing observation and repair procedures after flashing installation.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.
- B. Samples: For each exposed product and for each color and texture specified, 12 inches long by actual width.
- C. Samples for Verification: For each type of exposed finish.
 - 1. Sheet Metal Flashing: 12 inches long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
 - 2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches long and in required profile. Include fasteners and other exposed accessories.
 - 3. Unit-Type Accessories and Miscellaneous Materials: Full-size Sample.
- D. Shop Drawings: For sheet metal flashing and trim.
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
 - 3. Include identification of material, thickness, weight, and finish for each item and location in Project.
 - 4. Include details for forming, including profiles, shapes, seams, and dimensions.
 - 5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
 - 6. Include details of termination points and assemblies.
 - 7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
 - 8. Include details of roof-penetration flashing.
 - 9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
 - 10. Include details of special conditions.
 - 11. Include details of connections to adjoining work.
 - 12. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.
- B. Product Certificates: For each type of coping and roof edge flashing that is FM Approvals approved.
- C. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- D. Evaluation Reports: For copings and roof edge flashing, from an agency acceptable to authority having jurisdiction showing compliance with ANSI/SPRI/FM 4435/ES-1.

- E. Sample Warranty: For manufacturer's typical warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.
- B. Special warranty.

1.8 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of a minimum of 5 years successful in-service performance.
 - 1. For copings and roof edge flashings that are FM Approvals approved, shop shall be listed as able to fabricate required details as tested and approved.
 - 2. For copings and roof edge flashings that are ANSI/SPRI/FM 4435/ES-1 tested and FM Approvals approved, shop shall be listed as able to fabricate required details as tested and approved.
- B. Installer Qualifications: Engage an experienced Installer who has completed sheet metal flashing and trim work similar in material, design, and extent to that indicated for this Project and with a minimum 5-year fabrication and installation record of successful in-service performance.
- C. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
 - 1. Build mockup of all typical conditions and as required to be part of the on-site exterior mockup, including supporting construction cleats, seams, attachments, underlayment, lap and sealant joints, and mechanically-fastened and fully-soldered joints, and accessories.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Owner specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.
 - 1. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
 - 2. Protect stored sheet metal flashing and trim from contact with water.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.10 PROJECT CONDITIONS

- A. Coordinate Work of this Section with interfacing and adjoining Work for proper sequencing of each installation. Ensure best possible weather resistance, durability of Work, and protection of materials and finishes.

1.11 WARRANTY

A. Contractor's Warranty:

- 1. The Contractor shall provide a written warranty for sheet metal work including caulking and fasteners to be water-tight and secure for a period of two years from the date of final acceptance of the building. Warranty shall include all materials and workmanship required to repair any leaks that develop.

B. Manufacturer's Warranty:

- 1. Pre-finished metal material shall require a written 20-year warranty covering fade, chalking and film integrity. The material shall not show a color change greater than 5 NBS color units per ASTM D-2244 or chalking excess of 8 units per ASTM D-659.

C. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

- 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

- 2. Finish Warranty Period: 5 years from date of Substantial Completion.

D. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace sheet metal flashing and trim that does not comply with performance and other requirements specified in this Section within specified warranty period.

- 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Sheet metal flashing and trim assemblies, including cleats, anchors, and fasteners, shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

- B. SPRI Wind Design Standard: Manufacture and install copings and roof edge flashings tested in accordance with ANSI/SPRI/FM 4435/ES-1 and capable of resisting the following design pressure:
- C. FM Approvals Listing: Manufacture and install copings roof edge flashings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-90. Identify materials with name of fabricator and design approved by FM Approvals.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 SHEET METALS

- A. Galvanized Sheet Steel: ASTM A 526; with minimum 1.25 oz per sq ft galvanized coating, hot dipped G-90; minimum 24 gauge or as otherwise noted.
- B. Stainless-Steel Sheet: ASTM A240, 24-gauge Type 316 at grade and concrete.
- C. Zinc-Tin Alloy-Coated Stainless-Steel Sheet: ASTM A240, Type 316, dead-soft, fully annealed stainless-steel sheet, coated on both sides with a zinc-tin alloy (50 percent zinc, 50 percent tin). Copper Sheet: ASTM B370, cold-rolled copper sheet, H00 or H01 temper.
- D. Prepainted Steel Sheet for assemblies including factory-applied High-Performance Organic Finish; Steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process, including:
 - 1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A653, G90 coating designation; structural quality.
 - 2. Exposed-to-View Locations: High-Performance Organic Finish.
- E. Aluminum Sheet: ASTM B209, Alloy 3003, 3004, 3105, or 5005, Temper suitable for forming and structural performance required, but not less than H14, finished as follows:
 - 1. Exposed-to-View Locations: High-Performance Organic Finish.

2.3 UNDERLAYMENT MATERIALS

- A. Polyethylene Sheet: 6-mil-thick polyethylene sheet complying with ASTM D 4397.
- B. Felts: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
- C. Slip Sheet: Rosin-sized paper, minimum 3 lbs./100 sq. ft.

2.4 RELATED MATERIALS

- A. Sealants: Building sealant as specified in Section 07 92 00 – Joint Sealants.

- B. Solder and Flux: Solder ASTM B 32 Type recommended for materials being used; flux FS O-F-506C, Type I, Form A or B, 50/50 or better.
- C. Pipe Clamps: Stainless steel draw band with adjustable screws.
- D. Termination Bars: 24-gauge Type 316 stainless steel.
- E. Reglets: Standard recessed, or embedded types with strippable tape covers as manufactured by MM Systems, Fry Reglet, or equal.
- F. Fasteners (assure compatibility with metals contacted):
 - 1. Metal to wood (unexposed): 11-gauge galvanized ring shank, length sufficient to penetrate 1 inch into wood.
 - 2. Metal to wood (exposed): Hex head with neoprene washers, No. 10, 1-1/4 inches, HDG, painted heads.
 - 3. Rivets: ASTM B 315, alloy 110, 5052, 5056, or 6061; appropriate temper, unless temper is specified. Galvanized steel where soldering.
 - 4. Screws, bolts, nuts, and wire: ASTM B 211, alloy 1100, 5052 to 6061; appropriate temper.
 - 5. Metal to Metal: Stainless steel hex head screw, sufficient to penetrate base metal 1/2 inch, with neoprene washers.
 - 6. Expansion shields, packing and wedges: Lead or other nonferrous alloys.
 - 7. Other fasteners as required.
- G. Screen for Strainers and Gutter Screens: Galvanized steel wire hardware cloth woven of minimum 20-gage steel wire with 1/2-inch square mesh.
- H. Items for Permanent Protection of Dissimilar Metals and Materials:
 - 1. Asphalt-Saturated Felt: ASTM D226.
 - 2. Bituminous Paint: FS TT-C-494A.
 - 3. Compressible Tape: ASTM C 509. Closed cell black neoprene tape, size as noted, with adhesive system as recommended by manufacturer.

2.5 FACTORY COPING SYSTEMS

- A. General: Manufactured coping system consisting of formed-metal coping cap in section lengths not exceeding 12 feet, concealed anchorage, concealed splice plates with same finish as coping caps, pre-fabricated and mitered corner units, intersection units, and end cap units.
- B. Basis-of-Design Products: Provide copings equal to "Permasnap Plus" by W. P. Hickman Company, or equal, and as required to provide 100-percent shop or factory fabricated components for the layouts and conditions shown on the Drawings.
 - 1. Metal coping cap with galvanized steel anchor cleats and gutter support chairs for capping any parapet wall.
 - 2. Provide a system shall be watertight, maintenance free, and not require exposed fasteners or sealant.
 - 3. Joints shall be butt type with concealed splice plates.
 - 4. Gage:
 - a. Cleats: equivalent to 16-gage or greater.
 - b. Parapet Cap: equivalent to 24-gage or greater.
- C. Provide special fabrications as required for the layouts shown on Drawings, including:

1. Prefabricated Inside/Outside Corners, including watertight soldered joints.
 2. Prefabricated end units where coping butts a wall surface, including watertight, soldered flashing designed to be concealed behind the wall finish.
 3. Prefabricated units where work by Others penetrates one or more of the coping finish surfaces.
 4. Splice Blocks.
- D. Provide stainless steel base flashing below the copings as shown on the Drawings.
1. Minimum 0.0187-inch-thick Stainless Steel.

2.6 FACTORY REGLET AND COUNTERFLASHING SYSTEMS

- A. General: Provide factory-fabricated snap-lock type coping assemblies and accessories by Fry Reglet Corporation; MM Systems; Construction Specialties (C/S); or equal.
- B. Reglet and Counterflashing Assemblies:
1. Types: Provide with upturned fastening flange and extension leg of length to match thickness of applied finish materials, including coordinated removable counterflashing.
 2. Manufacturer: Provide reglet and counterflashing assemblies that allow the finish materials to be applied directly over the reglet.
 - a. Reglet Material: Stainless Steel, Type 304, 0.020-inches thick.
 - b. Finish: Standard uncoated finish.
 3. Counterflashing Type: "Springlok" Type flexible flashing.
 - a. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation; structural quality.
 - b. Finish: High Performance Organic Coating as specified in this Section.
 4. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.
 5. Provide special fabrications as required for the layouts shown on Drawings, including prefabricated Inside/Outside Corners, including watertight soldered joints.

2.7 SHOP FABRICATED CAP FLASHINGS AND EQUIPMENT PAD CLADDING

- A. General: Provide galvanized sheet metal cap flashings (copings) on rooftop equipment curbs and cladding on rooftop concrete equipment pads.
1. Provide "Factory Coping Systems" as specified in this Section with High-Performance Organic Finish at building perimeter, building perimeter setbacks and roof mechanical penthouses.
- B. General Materials:
1. Galvanized Sheet Steel: ASTM A 526; with minimum 1.25 oz per sq ft hot dip galvanized coating, G-90; minimum 18 gauge or as otherwise noted.
 2. Cleats: ASTM A 526; with minimum 1.25 oz per sq ft hot dip galvanized coating, G-90; minimum 16 gauge or as otherwise noted.
 - a. Fasteners: 8-inches on center.
- C. EQ Curb Cap Flashings (Coping): Fabricate to SMACNA standards.
1. Profile: SMACNA Figure 3.4A as shown on the Drawings.
 2. Provide Miter Corners with welded seams.
 3. Intermediate Joints: Provide splice block counterflashing of the same material as the cap flashing.

- D. EQ Pad Cladding: Fabricate to SMACNA standards.
 - 1. Fascia Edge Style: SMACNA Standard E1 edge style or better providing continuous positive locking to cleat.
 - 2. Provide Miter Corners with welded seams.
 - 3. Intermediate Seams: Provide SMACNA Standard Double Flat lock seam or better.

2.8 SHOP FABRICATED SCUPPERS, GUTTERS AND RAINLEADERS

- A. Downspouts: Fabricate to cross section shown on Drawings and otherwise in conformance with SMACNA recommendations, complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.
 - 1. Material:
 - a. Zinc-Coated (Galvanized) Steel Sheet: ASTM A653, G90 coating designation; structural quality, minimum 0.0217-inch thick.
 - b. Aluminum Sheet: ASTM B209, minimum 0.032-inch thick.
 - 2. Finish: High Performance Organic Coating as specified in Section 09 06 13 – Common Standards for Aluminum Finishes, and 09 06 23 – Common Standards for Ferrous Metal Finishes.
- B. Hanging Gutters: Fabricate to cross section shown on Drawings or otherwise in conformance with SMACNA recommendations, complete with end pieces, outlet tubes, and other accessories as required.
 - 1. Material:
 - a. Zinc-Coated (Galvanized) Steel Sheet: ASTM A653, G90 coating designation; structural quality, minimum 0.0217-inch thick.
 - b. Aluminum Sheet: ASTM B209, minimum 0.032-inch thick.
 - 2. Finish: High Performance Organic Coating as specified in Section 09 06 13 – Common Standards for Aluminum Finishes, and 09 06 23 – Common Standards for Ferrous Metal Finishes.
 - 3. Expansion Joints: Built in.
 - 4. Fabricate in minimum 96-inch-long sections.
 - 5. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness.
 - 6. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters.
 - 7. Accessories: Continuous removable leaf screen with sheet metal frame and hardware cloth screen.

2.9 FINISHES

- A. Conform with the requirements Section 09 96 00 – High Performance Coatings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.

1. Verify compliance with requirements for installation tolerances of substrates.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF UNDERLAYMENT

A. Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim.

1. Install in shingle fashion to shed water.
2. Lap joints not less than 2 inches.

B. Self-Adhering, High-Temperature Sheet Underlayment:

1. Install self-adhering, high-temperature sheet underlayment; wrinkle free.
2. Prime substrate if recommended by underlayment manufacturer.
3. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures.
4. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses.
5. Overlap side edges not less than 3-1/2 inches. Roll laps and edges with roller.
6. Roll laps and edges with roller.
7. Cover underlayment within 14 days.

C. Install slip sheet, wrinkle free, as shown on Drawings, before installing sheet metal flashing and trim.

1. Install in shingle fashion to shed water.
2. Lap joints not less than 4 inches.

3.3 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
3. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement.
4. Install sheet metal flashing and trim to fit substrates and to result in watertight performance.

5. Install continuous cleats with fasteners spaced not more than 12 inches o.c.
 6. Space individual cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
 7. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
 8. Torch cutting of sheet metal flashing and trim is not permitted.
 9. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
1. Coat concealed side of stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.
1. Space movement joints at maximum of **10 feet** with no joints within **24 inches** of corner or intersection.
 2. Form expansion joints of intermeshing hooked flanges, not less than **1 inch** deep, filled with sealant concealed within joints.
 3. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than **1 inch** into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between **40 and 70 deg F**, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below **40 deg F**.
 2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."
- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of **1-1/2 inches**; however, reduce pre-tinning where pre-tinned surface would show in completed Work.
1. Do not use torches for soldering.
 2. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
 3. Stainless-Steel Soldering: Tin edges of uncoated sheets, using solder for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

3.4 INSTALLATION OF ROOF-DRAINAGE SYSTEM

- A. Install sheet metal roof-drainage items to produce complete roof-drainage system in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.
- B. Downspouts:
 - 1. Join sections with 1-1/2-inch telescoping joints.
 - 2. Provide hangers with fasteners designed to hold downspouts securely to walls.
 - 3. Locate hangers at top and bottom and at approximately 60 inches o.c.
 - 4. Provide elbows at base of downspout to direct water away from building.
 - 5. Connect downspouts to underground drainage system.
- C. Splash Pans:
 - 1. Install where downspouts discharge on low-slope roofs.
 - 2. Set in adhesive or sealant compatible with the substrate.
- D. Parapet Scuppers:
 - 1. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.
- E. Conductor Heads: Anchor securely to wall, with elevation of conductor head rim at minimum of 1 inch below discharge.

3.5 INSTALLATION OF ROOF FLASHINGS

- A. Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard.
 - 1. Provide concealed fasteners where possible, and set units true to line, levels, and slopes.
 - 2. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Roof Edge Flashing:
 - 1. Install roof edge flashings in accordance with ANSI/SPRI/FM 4435/ES-1.
 - 2. Anchor to resist uplift and outward forces in accordance with recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch centers.
 - 3. Anchor to resist uplift and outward forces in accordance with recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for FM Approvals' listing for required windstorm classification.
- C. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with butyl sealant and clamp flashing to pipes that penetrate roof.

3.6 INSTALLATION OF WALL FLASHINGS

- A. Install sheet metal wall flashing to intercept and exclude penetrating moisture in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

3.7 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.8 CLEANING

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.

3.9 PROTECTION

- A. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.
- B. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended in writing by sheet metal flashing and trim manufacturer.
- C. Maintain sheet metal flashing and trim in clean condition during construction.
- D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures, as determined by Architect.

END OF SECTION

SECTION 07 72 60

ROOF FALL PROTECTION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general Provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Horizontal cable fall protection system for safe access at height, including end anchors, intermediate cable supports, variable cable supports, and corner cable supports.
 - 2. Skylight Guards.
 - 3. Foldable Fall Protection Railing.
 - 4. Warning Lines/Striping.

1.3 REFERENCE STANDARDS

- A. OSHA 1926.501 Fall Prevention Systems and Criteria and Practices
- B. ANSI A10.32 Requirements for Safety Belts, Harnesses, Lanyards, Lifelines – Construction and Demolition.
- C. ANSI Z 359 – Fall Protection Code
- D. California General Industry Safety Orders (GISO) Title 8 Articles five (5) and six (6).

1.4 PREINSTALLATION MEETING

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

- A. Product Data: Manufacturer's data and product information indicating the sizes, descriptions, capacities, test certifications, and other descriptive data showing in sufficient detail that the product complies with the contract requirements.
- B. Shop Drawings: Show the complete fall protection system. Show layout drawings of each system in relation to the supporting structure, indicating the locations of properly labeled components.
- C. Qualification Data: For qualified Installer.
- D. Professional engineer's qualifications.

- E. Product Certificate: Containing the manufacturer's serial number, name and part number of each individual component used in the system. Submit certificate from Installer that system components operate as specified.
- F. Systems Manual:
 - 1. Maintenance Procedures: Including parts list and maintenance requirements for all equipment.
 - 2. Operation Procedures: Indicating proper use of equipment for safe operation of the systems.
 - 3. Manufacturer's catalog data indicating the sizes, descriptions, capacities, test certifications, and other descriptive data showing sufficient detail that the product complies with the Contract Documents.
 - 4. As-Built Drawings.
 - 5. Warranty.

1.6 QUALITY ASSURANCE

- A. System shall be designed, stamped and signed by a Professional Engineer licensed in the State of California.
- B. Installer Qualifications: An employer of workers trained and approved by manufacturer for installation and maintenance of units required for this Project.

1.7 WARRANTY

- A. Warranty: Correct defective Work within a one-year period after Date of Substantial Completion.

1.8 OPERATIONAL INSTRUCTIONS

- A. Instruct the Owner's Representatives and selected User Personnel in the proper usage of the Fall Protection system. A representative of the supplier shall, at a time selected by the Owner, spend a minimum of eight hours, as needed, at the building, furnishing this instruction.
- B. Issue attendance certificates to Owner's maintenance personnel upon completion of training.

1.9 INFORMATIONAL SUBMITTALS

- A. Calculations: Prepared, signed and stamped by a professional engineer licensed in the State of California.

PART 2 - PRODUCTS

2.2 PERFORMANCE REQUIREMENTS

- A. Fall protection system shall be designed and engineered by the manufacturer to meet the following criteria:
1. **Wind Pressure: The installation shall be designed to withstand 25 miles per hour wind velocities while being used for normal operations and shall be fully operational at wind velocities up to 50 miles per hour.**
 2. The installation shall be designed to provide continuous contact between the platform and the structure as the platform descends and ascends.
 3. All Building Maintenance Equipment shall be designed by or under the direction of a Professional Engineer registered in the state where the project is located. A Professional Engineer registered in the state where the project is located shall verify all foreign produced equipment.
 4. All structure assemblies and components shall be designed with a safety factor of 4:1 safety against failure and to be so certified unless otherwise specified.

2.3 SYSTEM DESCRIPTION

- A. Furnish and install a horizontal lifeline system with dual stainless steel wire ropes, including supports and related work necessary to provide a complete installation. Indicate compatibility of the total system with the building structure and notify the Contractor if incompatibility exists. Give special attention to assure that the attachment to the building imparted to load carrying members is within allowable limits and that no member is overstressed. The loads imposed on the structure shall be submitted to the Architect for review.

2.4 MANUFACTURERS

- A. Kee Safety Systems, Inc., Guardian Fall Protection, Inc., CAI Safety Systems, Inc., Ideal Shield, Inc., 3M, Inc.

2.5 GUARDRAILS

- A. Permanent: As designed per Architectural and Structural Drawings
- B. Free-standing Weighted Guardrail:
1. KeeGuard Railing System by Kee Systems
 2. Roof Fall Protection Railing by Ideal Shield
 3. Or equal

2.6 ANCHORS POINTS

- A. Mobile Counterweight
1. Counterweight Roof Anchor with D-ring by CAI Systems
 2. KeyAnchor by Kee Systems
 3. Or equal
- B. Permanent Anchor Points

1. As designed per Architectural and Structural Drawings
 2. Pre-fabricated Product anchored to specified roof per Structural Drawings
 - a. KeeAnchor by Kee Systems
 - b. CB-12 or CB-18 Galvanized Roof Anchors by Guardian Fall Protection
 - c. Or equal
- C. Accessories
1. Lifelines
 - a. KeeLine by Kee Systems
 - b. Horizontal Lifelines by Guardian Fall Protection
 - c. Or equal
 2. Self-Retracting Lifelines
 - a. Self-Retracting Lifelines by Guardian Fall Protection
 - b. Self-Retracting Lifelines by 3M
 - c. Or equal
 3. Worker Harnesses
 - a. Harnesses by Guardian Fall Protection
 - b. Harnesses by 3M
 - c. Or equal

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, and other conditions affecting installation and performance of fall protection equipment.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Coordinate location of fall protection equipment indicated to be attached to structural substrate or surface of roofing system and furnish anchoring devices with templates and diagrams.

3.3 FIELD QUALITY CONTROL

- A. Manufacturer's certified installer shall inspect the installed fall protection system and shall certify the fall protection components operate as specified. Submit certificate to Architect.
- B. Adjust fall protection components to function smoothly and safely.

3.4 CLEANING

- A. Clean components of any deleterious coatings or compounds.
- B. Remove loose materials, crating, and packing materials from site.

3.5 CLOSEOUT ACTIVITIES

- A. Demonstration: Demonstrate operation of system to Owner's personnel. Briefly describe function, operation, and maintenance of each component.
- B. Training of Owner's Personnel: Provide minimum of two-hour training, using maintenance manual as a reference.
- C. Recertification: Coordinate an annual recertification program for the lifeline per manufacturer's recommendations.

END OF SECTION

SECTION 07 84 43

JOINT FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Refer to Engineering Judgment found on the Drawings.

1.2 SUMMARY

- A. Section Includes:
 - 1. Joints in or between fire-resistance-rated constructions.
 - 2. Joints in smoke barriers.
- B. Related Requirements:
 - 1. Section 09 22 16 "Non-Structural Metal Framing" for firestop tracks for metal-framed partition heads.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Product Schedule: For each joint firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing agency.
 - 1. Engineering Judgments: Where Project conditions require modification to a qualified testing agency's illustration for a particular joint firestopping system condition, submit illustration, with modifications marked, approved by joint firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

- B. Product Test Reports: For each joint firestopping system, for tests performed by a qualified testing agency.

1.6 CLOSEOUT SUBMITTALS

- A. Installer Certificates: From Installer indicating that joint firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FM Approvals according to FM Approvals 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with UL's "Qualified Firestop Contractor Program Requirements", unless pre-formed devices are utilized.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install joint firestopping systems when ambient or substrate temperatures are outside limits permitted by joint firestopping system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Install and cure joint firestopping systems per manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

1.9 COORDINATION

- A. Coordinate construction of joints to ensure that joint firestopping systems can be installed according to specified firestopping system design.
- B. Coordinate sizing of joints to accommodate joint firestopping systems.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics:
 - 1. Perform joint firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
 - 2. Test per testing standards referenced in "Joint Firestopping Systems" Article. Provide rated systems complying with the following requirements:
 - a. Joint firestopping systems shall bear classification marking of a qualified testing agency.
 - 1) UL in its "Fire Resistance Directory."
 - 2) Intertek Group in its "Directory of Listed Building Products."

2.2 MANUFACTURERS

- A. Manufacturers: Provide the following, or equal.
1. Basis-of-Design: Hilti, Inc.
 2. A/D Fire Protection Systems Inc.
 3. Grace Construction Products.
 4. Johns Manville.

2.3 JOINT FIRESTOPPING SYSTEMS

- A. Joint Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which joint firestopping systems are installed. Joint firestopping systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.
- B. Joints in or between Fire-Resistance-Rated Construction: Provide joint firestopping systems with ratings determined per ASTM E 1966 or UL 2079.
1. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of the wall, floor, or roof in or between which it is installed.
 2. Firestop Top Track Seal: For metal stud partitions installed on flat concrete slab use one-piece, pre-formed, polyurethane foam based, firestop seal for use with standard head-joint top tracks and bottom-joint tracks, and slip-type head joints in fire-rated construction at top or bottom of partition to maintain continuity of the fire-resistance-rated assembly indicated. Provide in width and configuration required to accommodate depth and installation of studs and designed to saddle-over the top track or under the bottom-track.
- C. Joints at Exterior Curtain-Wall/Floor Intersections: Provide joint firestopping systems with rating determined per ASTM E2307.
- D. Joints in Smoke Barriers: Provide fire-resistive joint systems with ratings determined per UL 2079 based on testing at a positive pressure differential of 0.30-inch wg.
1. L-Rating: Not exceeding 5.0 cfm/ft. of joint at both ambient and elevated temperatures.
- E. Exposed Joint Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.
1. F-Rating: Equal to or exceeding the fire-resistance rating of the floor assembly.
- F. Accessories: Provide components of fire-resistive joint systems, including primers and forming materials, that are needed to install elastomeric fill materials and to maintain ratings required. Use only components specified by joint firestopping system manufacturer and approved by the qualified testing agency for conditions indicated.
- G. Rain and water resistance: provide perimeter joint system tested in accordance with ASTM D6904 with less than 1 hour tack free time as tested in accordance with ASTM C679.
- H. Joints at Intersection between Rated Wall Assemblies and Nonrated Horizontal Assemblies: Provide joint firestopping systems with ratings determined by ASTM E 2837
- I. Mold Resistance: Provide joint firestopping system sealant with mold and mildew resistance rating of one (1) or less as determined by ASTM G21.

2.4 FILL MATERIALS

- A. Use only firestop products that have been tested in accordance with ASTM E 1966 and/or ANSI/UL 2079 for specific rated construction conditions conforming to construction assembly type, movement capability, spacing requirements, and fire-resistance-rating involved for each separate instance.
- B. Sealants, sprays, or pre-formed materials for use with fire-rated construction joints and other gaps, the following products are acceptable:
 - 1. Hilti Firestop Top Track Seal (CFS-TTS)
 - 2. Hilti Firestop Top Track Seal for Metal deck (CFS-TTS MD)
 - 3. Hilti Firestop Joint Spray (CFS-SP WB)
 - 4. Hilti Firestop Silicone Joint Spray (CFS-SP SIL)
 - 5. Hilti Flexible Firestop Sealant (CP 606)
 - 6. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants.
 - a. Basis-of-Design: Specified Technologies Inc. "SpecSeal Series SIL Silicone Sealant".
 - b. Hilti Firestop Silicone Sealant Gun Grade (CFS-S SIL GG)
 - c. Hilti Firestop Silicone Sealant Self Leveling (CFS-S SIL SL)
 - 7. Hilti bottom of wall sealant CP 605.
 - 8. Hilti Edge of Slab Firestop Device (CFS-EOS QS)
- C. Pre-formed materials or sealants for use as part of a Perimeter Fire Barrier System between fire-resistance-rated floors and exterior wall assemblies, the following products are acceptable:
 - 1. Hilti Firestop Joint Spray (CFS-SP WB)
 - 2. Hilti Firestop Silicone Joint Spray (CFS-SP SIL)
 - 3. Hilti Firestop Silicone Sealant Gun Grade (CFS-S SIL GG)
 - 4. Hilti Firestop Silicone Sealant Self Leveling (CFS-S SIL SL)
- D. Pre-formed mineral wool designed to fit flutes of metal profile deck and gap between top of wall and metal deck profile; use as a backer for spray material.
 - 1. Hilti Speed Plugs (CP 777)
 - 2. Hilti Speed Strips (CP 767)
- E. Provide a firestop system with an Assembly Rating as determined by ASTM E 1966 and/or ANSI/UL 2079 which is equal to the fire-resistance ratings of the construction in which the joint occurs.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Before installing fire-resistive joint systems, clean joints immediately to comply with fire-resistive joint system manufacturer's written instructions and the following requirements:
 - 1. Remove from surfaces of joint substrates foreign materials that could interfere with adhesion of elastomeric fill materials or compromise fire-resistive rating.
 - 2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with elastomeric fill materials. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Prime substrates where recommended in writing by joint firestopping system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3.3 INSTALLATION

- A. General: Install fire-resistive joint systems to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming materials and other accessories of types required to support elastomeric fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
 - 1. After installing elastomeric fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.
- C. Install elastomeric fill materials for fire-resistive joint systems by proven techniques to produce the following results:
 - 1. Elastomeric fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.
 - 2. Apply elastomeric fill materials so they contact and adhere to substrates formed by joints.
 - 3. For elastomeric fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.
- D. Firestop Systems do not reestablish the structural integrity of load bearing partitions/assemblies or support live loads and traffic. Installer shall consult the structural engineer prior to penetrating any load bearing assembly.

3.4 IDENTIFICATION

- A. Joint Identification: Identify joint firestopping systems with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of joint edge so labels are visible to anyone seeking to remove or joint firestopping system. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:

1. The words "Warning - Joint Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
2. Contractor's name, address, and phone number.
3. Designation of applicable testing agency.
4. Date of installation.
5. Manufacturer's name.
6. Installer's name.

3.5 FIELD QUALITY CONTROL

- A. Inspecting Agency: Owner will engage a qualified (meets ASTM E699 and E3038-16 Standards) independent inspecting agency to inspect fire-resistive joint systems and prepare inspections reports. Independent inspection agency shall comply with ASTM E2393 requirements including those related to qualifications, conducting inspections, and preparing reports.
- B. Where deficiencies are found or joint firestopping systems are damaged or removed due to testing, repair or replace joint firestopping systems so they comply with requirements.
- C. Proceed with enclosing joint firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.
- D. A manufacturer's direct representative (not distributor or agent) to be on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. This will be done per manufacturer's written recommendations published in their literature and drawing details.

3.6 CLEANING AND PROTECTION

- A. Clean off excess elastomeric fill materials adjacent to joints as the Work progresses by methods and with cleaning materials that are approved in writing by joint firestopping system manufacturers and that do not damage materials in which joints occur.
- B. Provide final protection and maintain conditions during and after installation that ensure joint firestopping systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated fire-resistive joint systems immediately and install new materials to produce fire-resistive joint systems complying with specified requirements.

END OF SECTION

SECTION 07 92 00
JOINTSEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Silicone joint sealants.
2. Urethane joint sealants.
3. Latex joint sealants.
4. Compressible filler.
5. Sanitary sealants.

- B. Related Sections:

1. Section 079219 "Acoustical Joint Sealants".
2. Section 088000 "Glazing" for glazing sealants.
3. Section 092900 "Gypsum Board" for sealing perimeter joints.
4. Section 093000 "Tiling" for sealing tile joints.

1.3 PREINSTALLATION MEETING

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.

- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

- D. 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.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.
- C. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.
- D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.
- E. Preconstruction Laboratory Test Schedule: Include the following information for each joint sealant and substrate material to be tested:
 1. Joint-sealant location and designation.
 2. Manufacturer and product name.
 3. Type of substrate material.
 4. Proposed test.
 5. Number of samples required.
- F. Preconstruction Laboratory Test Reports: From sealant manufacturer, indicating the following:
 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 2. Interpretation of test results and written recommendations for primers and substrate preparation are needed for adhesion.
- G. Preconstruction Field-Adhesion Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.
- H. Field-Adhesion-Test Reports: For each sealant application tested.
- I. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.
- C. Product Testing: Test joint sealants using a qualified testing agency.
 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
 2. Test according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.

- D. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.7 PRECONSTRUCTION TESTING

- A. Preconstruction Laboratory Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
1. Adhesion Testing: Use ASTM C794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 2. Compatibility Testing: Use ASTM C1087 to determine sealant compatibility when in contact with glazing and gasket materials.
 3. Submit manufacturer's recommended number of pieces of each type of material, including joint substrates, joint-sealant backings, and miscellaneous materials.
 4. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 5. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures, including use of specially formulated primers.
 6. Testing will not be required if joint-sealant manufacturers submit data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, staining of, and compatibility with joint substrates and other materials matching those submitted.
- B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
 2. Conduct field tests for each application indicated below:
 - a. Each kind of sealant and joint substrate indicated.
 3. Notify Architect seven days in advance of dates and times when test joints will be erected.
 4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
 - a. 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.
 - 1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
- C. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
- D. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.8 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
 2. When joint substrates are wet.
 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.9 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.
- B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.10 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.
- B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
1. Warranty Period: 10 years from date of Substantial Completion.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 2. Disintegration of joint substrates from natural causes exceeding design specifications.
 3. Mechanical damage caused by individuals, tools, or other outside agents.
 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Joint sealants are required to establish and maintain airtight and waterproof continuous seals on a permanent basis, with recognized limitations of wear and aging as indicated for each application.

2.2 JOINT SEALANTS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- 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.
- 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.
- D. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 MANUFACTURER/TYPE - SEALANTS

- A. Colors: Match sealant color to color of adjacent materials as closely as possible using colors selected from the manufacturer's standard palette, as approved by the Architect.
- B. General:
 - 1. Do not mix multiple component materials until required for use.
 - 2. Use materials "as received" from manufacturer, without additions, deletions and adulterations of materials.
 - 3. Do not use sealants that have started to cure and those whose shelf life expired.
- C. Compatibility: Provide joint sealers, joint fillers and other related materials as follows:
 - 1. That will not cause staining, degradation and premature aging of the adjacent surfaces and the sealant itself, when in contact with these surfaces.
 - 2. Compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- D. Bulk sealants:
 - 1. For interior slabs where heavy wheeled traffic will occur: One of the following, or equal.
 - a. L&M:
 - 1) "Epoflex" (epoxy).
 - 2) "Joint Tite" (urea).
 - b. Atlas "Epoxy Joint Filler."

- c. Nox-Crete: "DynaFlex JF-85."
 - d. VersaFlex, Inc.: SL Series (polyurea) as recommended by the manufacturer after surveying the conditions at the site.
 2. For interior and exterior horizontal application subject to pedestrian or vehicular traffic: Single component silicone sealant.
 - a. Dow Corning Corp.; "890-SL" or "SL Parking Structure Sealant" (basis of design).
 - b. Pecora Corp.; "300 SL Pavement Sealant."
 - c. Crafcro Inc.; "RoadSaver Silicone SL."
 3. For all other exterior applications:
 - a. Dow Corning "795" (basis of design).
 - b. General Electric "Silpruf," "Silpruf LM," "Silpruf NB."
 - c. Tremco "Spectrem 1."
 4. For interior damp, wet and semi-wet locations, other than floors, such as toilet rooms where a mildew-resistant sealant is required: Provide white sealant, unless otherwise noted. Single-component mildew-resistant neutral-curing silicone sealant:
 - a. Dow Corning Corp. "786" basis of design.
 - b. Pecora Corp. "898."
 - c. General Electric Corp. "1700."
 5. For all other interior applications (paintable sealant): Latex sealant complying with ASTM C 834, Type P, Grade NF.
 - a. Pecora Corp. "AC-20+."
 - b. Schnee-Morehead, Inc. "SM8200."
 - c. Sonneborn, Division of ChemRex Inc. "Sonolac."
 - d. Tremco "Tremflex 834" or "Acrylic Latex 384."
 - E. Sanitary Sealant. ASTM C920, Type S, Grade NS, to be used at Toilet Rooms, color to be determined.
 - F. Tape sealants: American Saint-Gobain "Norseal 730" or "Norseal 770," or equal by Pres-On Tape & Gasket Corp. or Schnee-Morehead.
- 2.4 ACCESSORY MATERIALS
- A. Sprayed polyurethane foam sealant: One- or 2-component, foamed-in-place, polyurethane foam sealant, 1.5 to 2.0 pcf density; flame spread index of 25 or less according to ASTM E 162; with primer and noncorrosive substrate cleaner recommended by foam sealant manufacturer.
 - B. Joint cleaner, primer and sealer: As recommended by the sealant manufacturer, for the surfaces to be cleaned, primed or sealed.
 - C. Bond breaker tape:
 1. Polyethylene or other plastic tape recommended by the sealant manufacturer to prevent 3-sided adhesion where backer rod cannot be used, except for non-moving joints.

2. Use self-adhering tape wherever possible.

D. Backer rod:

1. General: Provide size, density and shape of rod which will control the joint depth for sealant placement, break bond of sealant at bottom of joint, form optimum shape of sealant bead on back, and provide a highly compressible backer to minimize the possibility of sealant extrusion when joint is compressed.
2. Type: ASTM C 1330, of type indicated below:
 - a. Type C: Closed-cell material with a surface skin, Nomaco "SOF ROD/Dual Rod," or equal.
 - b. For sealant in vehicular traffic areas, provide solvent-resistant backer rods, Nomaco HBR/Green Rod, or equal.
 - c. For fillet and cove joints, Nomaco "HBR" 1/4-inch Round."
3. Elastomeric tubing sealant backings:
 - a. Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, non-absorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26-degree F.
 - b. Provide products with low compression set.
4. In paving subject to traffic: Provide hard joint filler such as cork; prevent 3-sided adhesion by using bond breaker tape.

- E. Masking tape: Non-staining, non-absorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXTENT, PER CALIFORNIA ENERGY EFFICIENCY STANDARDS

- A. All joints and other openings in the building envelope that are potential sources of air leakage shall be caulked, gasketed, weather-stripped, or otherwise sealed to limit air leakage into or out of the building. This applies to penetrations for pipes and conduits, ducts, vents, and other openings. All gaps between wall panels, around doors, and other construction joints shall be well sealed. Ceiling joints, lighting fixtures, plumbing openings, doors and windows shall be considered as potential sources of unnecessary loss due to infiltration.

3.2 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Remove laitance and form-release agents from concrete.
 3. 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: 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.

3.4 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. 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.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. 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.
- F. 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 C1193, unless otherwise indicated.
 4. Provide flush joint profile where indicated per Figure 8B in ASTM C1193.
 5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.5 FIELD QUALITY CONTROL

- A. 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.

3.6 CLEANING

- A. 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.

3.7 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION

SECTION 08 11 13

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes:

- 1. Interior standard steel doors and frames.
- 2. Exterior standard steel doors and frames.

- B. Related Requirements:

- 1. Section 07 92 00 "Joint Sealants."
- 2. Section 08 71 00 "Door Hardware" for door hardware for hollow-metal doors.
- 3. Section 09 91 00 "Painting and Coating."

1.3 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or ANSI/SDI A250.8.

1.4 COORDINATION

- A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.
- B. Coordinate requirements for installation of door hardware, electrified door hardware, and access control and security systems.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, core descriptions, fire-resistance ratings, and finishes.
- B. Shop Drawings: Include the following:
 - 1. Elevations of each door type.
 - 2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
 - 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 - 4. Locations of reinforcement and preparations for hardware, if included in door manufacturer's bid.
 - 5. Details of each different wall opening condition.
 - 6. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
 - 7. Details of anchorages, joints, field splices, and connections.
 - 8. Details of accessories.
 - 9. Details of moldings, removable stops, and glazing.
 - 10. Details of conduit and preparations for power, signal, and control systems.
- C. Product Schedule: For hollow-metal doors and frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.

1.7 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each type of **fire-rated hollow-metal door and frame assembly** and **fire-rated borrowed-lite assembly** for tests performed by a qualified testing agency indicating compliance with performance requirements.
- B. Oversize Construction Certification: For assemblies required to be fire-rated and exceeding limitations of labeled assemblies.
- C. Field quality control reports.

1.8 CLOSEOUT SUBMITTALS

- A. Record Documents: For all doors.
 - 1. For fire-rated doors, include list of door numbers and applicable room name and number to which door accesses.

1.9 QUALITY ASSURANCE

- A. Fire-Rated Door Inspector Qualifications: Inspector for field quality control inspections of fire-rated door assemblies shall meet the qualifications set forth in NFPA 80, section 5.2.3.1 and the following:
 - 1. Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAI) certification.
- B. Egress Door Inspector Qualifications: Inspector for field quality control inspections of egress door assemblies shall meet the qualifications set forth in NFPA 101, Section 7.2.1.15.4 and the following:
 - 1. Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAI) certification.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow-metal doors and frames palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
 - 1. Provide additional protection to prevent damage to factory-finished units.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow-metal doors and frames vertically under cover at Project site with head up. Place on minimum 4-inch- high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings and temperature-rise limits indicated on Drawings, based on testing at positive pressure according to NFPA 252 or UL 10C.
 - 1. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.
 - 2. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.

- B. Fire-Rated, Borrowed-Lite Assemblies: Assemblies complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.

2.2 MANUFACTURERS

- A. Steelcraft; An Ingersoll-Rand Company
- B. Curries; An Assa Abloy Company
- C. Ceco; An Assa Abloy Company

2.2 MATERIALS

- A. Frames and frame components shall be manufactured from commercial quality carbon steel conforming to ASTM designation A568 and A569 or hot-dipped galvanized steel having an A60 zinc-iron alloy coating conforming to ASTM designation A653. Embossed CE-Series EmCraft doors shall have as standard, hot-dipped galvanized steel face sheets having an A40 zinc-iron alloy coating conforming to ASTM designation A653. Galvanized steel shall be treated to insure proper paint adhesion. All steel component parts used in galvanized doors and/or frames shall meet the galvanized specification. Stainless steel shall be fabricated from type 304 or 316 stainless steel polished to a number 4 matte finish. All steel component parts used in stainless doors and/or frames shall also be stainless steel.
- B. All doors, frames and frame components shall be cleaned, phosphatized, and finished as standard with one coat of rust inhibiting prime paint in accordance with ANSI A250.10.

2.3 DOORS

- A. Exterior doors shall be 16-gauge hot dipped galvanized steel, with closed tops.
- B. Interior doors shall be 16-gauge commercial quality carbon steel
- C. Construction of Doors:
 - 1. Flush Doors
 - a. Laminated core doors
 - b. L-Series Doors shall be full-flush or full-flush seamless construction, fabricated from commercial quality carbon steel or hot-dipped galvanized steel (see Section 2.01A) 18, 16 for 1-3/4" doors. Doors shall be reinforced, sound deadened and insulated with impregnated Kraft honeycomb core completely filling the inside of the doors and laminated to inside faces of both panels using contact adhesive applied to both panels and honeycomb core.
 - c. Door shall have continuous vertical mechanical interlocking joints at lock and hinge edges with visible edge seams or with edge seam filled and ground smooth. The internal portion of the seam shall be sealed with epoxy. An intermittent fastening along the seam is not permitted. Doors shall have beveled (1/8" in 2") hinge and lock edges. Top and bottom steel reinforcement channels

- shall be galvanized 14 gage and projection welded to both panels.
- d. Hinge reinforcements shall be 7 gage for 1-3/4" doors. Lock reinforcements shall be 16 gage and closer reinforcements 14 gage- box minimum 6" high and 20" long. Hinge and lock reinforcements shall be projection welded to the edge of the door. Galvanized doors shall have galvanized hardware reinforcements. Adequate reinforcements shall be provided for other hardware as required.
 - e. Glass trim for doors with cutouts shall be 24 gage steel conforming to ASTM designation A 924 hot dipped galvanized steel with a zinc coating of 0.06 ounces per square foot. The trim shall be installed into the door as a four sided welded assembly. The trim shall fit into a formed area of the door face, shall not extend beyond the door face and shall interlock into the recessed area. The corners of the assembly shall be mitered, reinforced and welded. The trim shall be the same on both sides of the door. Exposed fasteners shall not be permitted. Label and non-label doors shall use the same trim.
 - f. Doors indicating divided glass lites shall be made using a door with a cutout and trim for one piece of glass. The small lites shall be created by an extruded aluminum grille work mechanically fastened to the glass lite trim on both sides of the door. The grille work sections shall be beveled on the exposed side and shall have a flange on the unexposed side to which glazing tape can be applied. The grille work shall be installed into both sets of glass trim prior to installing into the door. One glass trim and muntin assembly shall be installed into the door prior to glazing. After glazing the other glass trim and muntin assembly shall be installed into the door.
 - g. All exterior out swing doors shall have the tops closed to eliminate moisture penetration. Door tops shall have no holes or openings. Top caps are permitted.

2.4 FRAMES

- A. Exterior frames shall be 16-gauge hot dipped galvanized steel.
- B. Interior frames shall be 16-gauge commercial quality carbon steel
- C. Construction Frames:
 - 1. Flush Frames
 - a. F-Series flush frames shall be formed from 16-gauge commercial quality carbon steel or galvanized steel (see Section 2.01).
 - b. F-Series frames shall have 2" faces, FN-Series frames shall have 1" faces. F16 gage frames shall be set-up and back welded with full penetration through to the face, ground down and smoothed. Miter corners shall have reinforcements with four concealed integral tabs for secure and easy interlocking of jambs to head.
 - c. Frames for 1-3/4" doors shall have 7 gage) universal steel hinge reinforcements prepared for 4-1/2" x 4-1/2" standard or heavy weight template hinges. Strike reinforcements shall be 16 gage and prepared for an ANSI-A115.1-2 strike.
 - d. Steel plaster guards shall be provided for all mortised cutouts. All hinge and strike reinforcements shall be projection welded to the door frame. Reinforcements for surface applied door closers shall be 14-gage steel.
 - e. Galvanized frames shall have galvanized hardware reinforcements. Adequate reinforcements shall be provided for other hardware when required. F-Series frames shall be furnished with a minimum of six wall anchors and two adjustable base anchors of manufacturer's standard design. FN-Series frames shall be furnished with a minimum of six wall anchors and two fixed base anchors.

- 1) Steel plaster guards shall be provided for all mortised cutouts.
 - 2) All hinge and strike reinforcements shall be projection welded to the door frame.
 - 3) Reinforcements for surface closer shall be 14-gauge steel. Adequate reinforcements shall be provided for other hardware when specified.
 - 4) Galvannealed frames shall have galvannealed hardware reinforcements.
2. Drywall Frames
- a. DW and K-Series drywall frames shall be formed from 16-gauge commercial quality carbon steel or galvannealed steel. DW and K-Series frames shall be formed with double return backbends to prevent cutting into the drywall surface. Frames shall be knocked down, designed to be securely installed in the rough opening after wallboard is applied. Mitered corners shall be reinforced with a wedge lock corner clip to provide a firm interlock of jambs to head.
 - b. Frames for 1-3/4" doors shall have 7 gage steel hinge reinforcements and preparation for 4-1/2" x 4-1/2" standard weight template hinges. Strike jamb shall have 16 gage strike reinforcement and preparation for ANSI A115.1-2 strike. Strike jamb shall have 14-gauge reinforcement and preparation for ANSI A115.3 strike.
 - c. Each jamb shall have an adjustable compression anchor located 4" from the top of the door opening to hold the frame in rigid alignment. DW-Series frames shall have a welded-in base anchor attaching plate in each jamb for field installation of loose base anchors. K-Series frames shall have a dimpled hole in each face, near the bottom of each jamb for screw anchoring the base of frame to the wall construction.
3. Construction of Architectural Stick Components
- a. Architectural stick frame assemblies shall be made of standard frame components, manufactured from 16-gauge or 14-gauge commercial quality carbon steel or galvannealed steel. Where sticks are used at door openings and frame assemblies, they shall be prepared for hardware as specified. Frame assemblies shall be fabricated from three basic components:
 - 1) Open sections (perimeter members), closed sections (intermediate members), and sill sections.
 - 2) Open sections shall be identical in configuration to Steelcraft standard frames.
 - 3) Closed sections shall have identical jamb depths, face dimensions and stops as open sections. Closed sections shall be factory assembled and shall have full length internal reinforcement of 16-gauge steel, factory spot-welded to both soffits at 8" on center.
 - 4) Sill sections shall be fabricated from galvannealed steel and shall be either flush with both faces of adjacent vertical members or recessed from one face of the adjacent vertical members.
 - b. Individual components shall be cut to length and notched to assure square joints and corners. All joints and corners of the frame assembly shall be welded and ground smooth at the face of the sections. Frame assemblies shall be shipped to job site completely welded. Field joints shall be permitted only when the size of the total assembly exceeds shipping limitations. When frame assemblies are subjected to windloads, vertical members shall be free of field splices.
 - c. When specified, steel panels shall be furnished 3/8" or 1-3/4" thick as required. 3/8" panels shall be made of 18-gauge cold-rolled steel faces with a corrugated fiberboard filler. 1-3/4" panels shall be made of 20 gage cold-rolled steel faces

with a honeycomb core. Cores shall be laminated to inside faces of both panels. Stick components and panels shall be furnished as specified in Section 2.01. Steel channel glazing beads shall be provided with assemblies for all areas in which glass or panels are to be installed and shall be pierced and dimpled for oval head sheet metal screws.

- d. All necessary anchors for jambs, heads and sills of assemblies shall be provided. When verification of field dimensions is necessary, they shall be made by the contractor. Frame fabrication shall not begin until these dimensions have been submitted.

2.5 ACCESSORIES

- A. Vision Lites shall be as indicated on the drawings; moldings shall be manufacturer's standard.
- B. Louvers shall be as indicated on the drawings; blade and frame configuration shall be manufacturer's standard or as specified elsewhere.

2.6 PROTECTIVE COATINGS

- A. The inside of all frames shall be fully grouted or, when an anti-freeze agent is used, shall be coated with a fibered asphalt coating prior to grouting. Coating shall be field applied by the contractor to a minimum 1/16" thickness.

2.7 FABRICATION

- A. Frames shall be supplied
 1. Knocked-down for field assembly for interior doors only with Architect's prior approval.
 2. Set up and welded with faces welded and ground smooth. Miters of frames shall be back welded. Weld shall penetrate the outside face. Faces shall be dressed smooth and prime painted. Filler materials are not permitted.
- B. Where indicated on drawings, frames shall be supplied with hospital type stops terminating 4" from the bottom of jambs on a 45° angle.

2.8 FINISH

- A. All doors, frames and frame components shall be cleaned, phosphatized and finished as standard with one coat of rust inhibiting prime paint in accordance with the ANSI A250.10 "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames".
- B. Factory finish painted doors and frames shall be cleaned, phosphatized and finished with rust inhibiting paint capable of passing a 200-hour salt spray and 480-hour humidity test in accordance with ASTM designation B117 and ASTM designation D1735. Finish paint shall be in accordance with ANSI/SDI A250.3, "Test Procedure and Acceptance Criteria for Factory Applied Finish Painted Steel Surfaces for Steel Doors and Frames".

PART 2 - EXECUTION

2.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

2.2 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.
- B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

2.3 INSTALLATION

- A. Install hollow-metal doors and frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions.
- B. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.
 - 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. At fire-rated openings, install frames according to NFPA 80.
 - b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - c. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - d. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.

- e. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.
2. Floor Anchors: Secure with postinstalled expansion anchors.
 - a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
4. Concrete Walls: Solidly fill space between frames and concrete with mineral-fiber insulation.
5. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout or mortar.
6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. **[Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.]**
7. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
- C. Hollow-Metal Doors: Fit and adjust hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
 1. Non-Fire-Rated Steel Doors: Comply with ANSI/SDI A250.8.
 - a. Between Door and Frame Jambs and Head: 1/8 inch plus or minus 1/32 inch.
 - b. Between Edges of Pairs of Doors: 1/8 inch to 1/4 inch plus or minus 1/32 inch.
 - c. At Bottom of Door: 3/4 inch plus or minus 1/32 inch.
 - d. Between Door Face and Stop: 1/16 inch to 1/8 inch plus or minus 1/32 inch.
 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
 3. Smoke-Control Doors: Install doors and gaskets according to NFPA 105.
- D. Glazing: Comply with installation requirements in Section 08 80 00 "Glazing" and with hollow-metal manufacturer's written instructions.

2.4 FIELD QUALITY CONTROL

- A. Inspection Agency: Owner will engage a qualified inspector to perform inspections and to furnish reports to Architect.
- B. Inspections:
 1. Fire-Rated Door Inspections: Inspect each fire-rated door according to NFPA 80, Section 5.2.
 2. Egress Door Inspections: Inspect each door equipped with panic hardware, each door equipped with fire exit hardware, each door located in an exit enclosure, each

electrically controlled egress door, and each door equipped with special locking arrangements according to NFPA 101, Section 7.2.1.15.

- C. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.
- D. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.
- E. Prepare and submit separate inspection report for each fire-rated door assembly indicating compliance with each item listed in NFPA 80.

2.5 REPAIR, CLEANING, AND TOUCHUP

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow-metal work immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.
- E. Factory-Finish Touchup: Clean abraded areas and repair with same material used for factory finish according to manufacturer's written instructions.
- F. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION

SECTION 08 14 16

FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Solid-core doors with wood veneer faces.
 - 2. Factory finishing flush wood doors.
 - 3. Factory fitting flush wood doors to frames and factory machining for hardware.
 - 4. Door louvers.

- B. Related Requirements:
 - 1. Section 08 12 16 "Interior Aluminum Frames" for door frames.
 - 2. Section 08 80 00 "Glazing" for glass view panels in flush wood doors.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of door. Include details of core and edge construction and trim for openings. Include the following:
 - 1. Door core materials and construction.
 - 2. Door edge construction
 - 3. Door face type and characteristics.
 - 4. Door louvers.
 - 5. Door trim for openings.
 - 6. Door frame construction.
 - 7. Factory-machining criteria.
 - 8. Factory-priming and finishing specifications.

- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each type of door; construction details not covered in Product Data; and the following:
 - 1. Door schedule indicating door and frame location, type, size, fire protection rating, and swing.

2. Door elevations, dimension and locations of hardware, lite and louver cutouts, and glazing thicknesses.
3. Details of frame for each frame type, including dimensions and profile.
4. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
5. Dimensions and locations of blocking for hardware attachment.
6. Dimensions and locations of mortises and holes for hardware.
7. Dimensions and locations of cutouts.
8. Clearances and undercuts.
9. Requirements for veneer matching.
10. Doors to be factory primed and finished and application requirements.

C. Apply WI Certified Compliance Program label to Shop Drawings.

D. Samples for Verification:

1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish. For each wood species and transparent finish, provide set of three Samples showing typical range of color and grain to be expected in finished Work.
2. Corner sections of doors, approximately 8 by 10 inches, with door faces and edges representing actual materials to be used.
3. Louver blade and frame sections, 6 inches (150 mm) long, for each material and finish specified.
4. Frames for light openings, 6 inches long, for each material, type, and finish required.

E. Special warranties.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For door inspector.

1. Fire-Rated Door Inspector: Submit documentation of compliance with NFPA 80, Section 5.2.3.1.
2. Egress Door Inspector: Submit documentation of compliance with NFPA 101, Section 7.2.1.15.4.
3. Submit copy of DHI's Fire and Egress Door Assembly Inspector (FDAI) certificate.

B. Field quality-control reports.

C. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Special warranties.

B. Quality Standard Compliance Certificates: WI Certified Compliance Program certificates.

C. Record Documents: For fire-rated doors, list of door numbers and applicable room name and number to which door accesses.

1.7 QUALITY ASSURANCE

- A. Manufacturer's Certification: Licensed participant in WI's Certified Compliance Program.
- B. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.
- C. Vendor Qualifications: A vendor that is certified for chain of custody by an FSC-accredited certification body.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in cardboard cartons and wrap bundles of doors in plastic sheeting.
- C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until building is enclosed and weathertight, wet work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 43 and 70 percent during remainder of construction period.

1.10 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace doors and frames that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Delamination of veneer.
 - b. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
 - c. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
 - 2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
 - 3. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Marshfield Door Systems; Algoma Hardwoods; Eggers Industries; or equal.

2.2 DOORS AND PANELS

- A. All Doors: See drawings for locations and additional requirements.
- B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
 - 1. Provide solid core doors at all locations.

2.3 DOORS FOR OPAQUE FINISH

- A. Interior Solid-Core Doors:
 - 1. Grade: Premium.
 - 2. Faces: MDO, applied to standard-thickness, closed-grain, hardwood face veneers or directly to high-density hardboard crossbands.
 - 3. Exposed Vertical and Top Edges: Any closed-grain hardwood.
 - 4. Core: Particleboard.
 - 5. Construction: Five or seven plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering. Faces are bonded to core using a hot press.
 - 6. Adhesives: Type I per WDMA T.M.-6.
 - 7. WDMA I.S.1-A Performance Grade: Heavy Duty.

2.4 DOOR FRAMES

- A. Interior Frames: Refer to Section 08 11 13.

2.5 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
- B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.
 - 1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.
- C. Openings: Factory cut and trim openings through doors.
 - 1. Louvers: Factory install louvers in prepared openings.

2.6 FINISHING

- A. Opaque Finish:
 - 1. North American Architectural Woodwork Standards. Grade: Premium.
 - 2. Color and Sheen: Match Architect's sample.

PART 3 - EXECUTION

3.1 INSTALLATION

3.2 EXAMINATION

- A. Examine doors and installed door frames, with Installer present, before hanging doors.
 - 1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

- A. Hardware: For installation, see Section 08 71 00 "Door Hardware".
- B. Install doors and frames to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
- C. Install frames level, plumb, true, and straight.
 - 1. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.
 - 2. Anchor frames to anchors or blocking built in or directly attached to substrates.
 - a. Secure with countersunk, concealed fasteners and blind nailing.
 - b. Use fine finishing nails for exposed fastening, countersunk and filled flush with woodwork.
 - 1) For factory-finished items, use filler matching finish of items being installed.
 - 3. Install fire-rated doors and frames in accordance with NFPA 80.
- D. Job-Fitted Doors:
 - 1. Align and fit doors in frames with uniform clearances and bevels as indicated below.
 - a. Do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors.
 - 2. Machine doors for hardware.
 - 3. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
 - 4. Clearances:
 - a. Provide 1/8 inch at heads, jambs, and between pairs of doors.
 - b. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering unless otherwise indicated on Drawings.

- c. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold unless otherwise indicated.
 - d. Comply with NFPA 80 for fire-rated doors.
 - 5. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.
 - 6. Bevel fire-rated doors 1/8 inch in 2 inches at lock edge; trim stiles and rails only to extent permitted by labeling agency.
 - E. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
 - F. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.
- 3.4 FIELD QUALITY CONTROL
- A. Inspection Agency: Owner will engage a qualified inspector to perform inspections and to furnish reports to Architect.
 - B. Inspections:
 - 1. Provide inspection of installed Work through WI's Certified Compliance Program, certifying that wood doors and frames, including installation, comply with requirements of AWI/AWMCA/WI's "Architectural Woodwork Standards" for the specified grade.
 - 2. Fire-Rated Door Inspections: Inspect each fire-rated door in accordance with NFPA 80, Section 5.2.
 - 3. Egress Door Inspections: Inspect each door equipped with panic hardware, each door equipped with fire exit hardware, each door located in an exit enclosure, each electrically controlled egress door, and each door equipped with special locking arrangements in accordance with NFPA 101, Section 7.2.1.15.
 - C. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.
 - D. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.
 - E. Prepare and submit a separate inspection report for each fire-rated door assembly indicating compliance with each item listed in NFPA 80.
- 3.5 ADJUSTING
- A. Operation: Rehang or replace doors that do not swing or operate freely.
 - B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION

SECTION 08 31 13

ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

- A. Access panels and doors in walls.
- B. Related Requirements:
 - 1. Section 07 72 00 "Roof Accessories" for roof hatches.
 - 2. Section 07 92 00 "Joint Sealants."
 - 3. Section 09 29 00 "Gypsum Board."
 - 4. Section 09 91 00 "Painting and Coating" for field-finishing.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, fire ratings, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings:
 - 1. Include plans, elevations, sections, details, and attachments to other work.
 - 2. Detail fabrication and installation of access doors and frames for each type of substrate.
- C. Samples: For each type of access door and frame and for each finish specified, complete assembly minimum 6 by 6 inches in size.
- D. Product Schedule: For access doors and frames. Use same designations indicated on Drawings.
- E. Location Drawing: Required access doors may not be indicated on the Drawings. Show proposed location of every required access door with dimensions in plan and elevation. Verify locations with the Architect. Access doors shall be located within walls and ceilings for access including but not limited to the following: automatic valves, automatic dampers, air terminal units, and fire/smoke dampers. Show location of adjacent materials, trim pieces, and hardware required to complete the work. Do not begin installation until location is approved. Submit access door locations superimposed on piping layout and duct layout shop drawings

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing and inspecting agency.
 - 1. Fire-Rated Door Inspector: Submit documentation of compliance with NFPA 80, Section 5.2.3.1.
 - 2. Submit copy of DHI Fire and Egress Door Assembly Inspector (FDAI) certificate.

1.5 CLOSEOUT SUBMITTALS

- A. Record Documents: For fire-rated doors, list of applicable room name and number in which access door is located.

1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of access door and frame from single source from single manufacturer.
- B. Fire-Rated Door Inspector Qualifications: Inspector for field quality control inspections of fire-rated door assemblies shall meet the qualifications set forth in NFPA 80, Section 5.2.3.1 and the Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAI) certification.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Access Doors and Frames: Units complying with NFPA 80 that are identical to access door and frame assemblies tested for fire-test-response characteristics according to the following test method and that are listed and labeled by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - 1. NFPA 252 or UL 10B for fire-rated access door assemblies installed vertically.
 - 2. NFPA 288 for fire-rated access door assemblies installed horizontally.

2.2 ACCESS PANELS FOR WALLS

- A. Metal Types:
 - 1. Non-Rated Gypsum Board Partitions (Typical): Karp Type KDW, or equal, flush panel type for field painting with frame flanges for joint compound concealment, 16-gauge steel frames and 14-gauge steel doors.
 - 2. Non-Rated Gypsum Board Partitions (Public Spaces): Karp Type RDW, or equal, recessed panel type for installation of gypsum board by others as with frame flanges for joint compound concealment, 16-gauge steel frames and 14-gauge steel doors.

- B. Finish:
 - 1. Typical unless otherwise noted: Provide shop primed metal access panels for field painting as specified in Section 09 91 00 – Painting and Coatings.
 - 2. Tile surfaces as shown on Drawings: Provide brushed stainless steel.
- C. Sizes: 24 inches by 24 inches, unless otherwise shown.
- D. Hardware: Manufacturer's standard.

2.3 ACCESS PANELS FOR CEILINGS

- A. Typical Lay-in Glass Fiber Reinforced Gypsum (GFRG) Type:
 - 1. Manufacturer: Acudor Products Inc., or equal.
 - 2. Non-Rated Gypsum Board Ceilings: Lay-in GFRG panels with rounded corners and matching GFRG frames with tapered edges.
 - a. Provide smooth finish on panel and frame faces ready for painting as specified in Section 09 91 00 – Interior Painting.
 - 3. Restroom Ceilings: Provide painted metal hinged and latching ceiling access panels in restroom gypsum ceilings and other locations where lay-in type access panels may displace upon door opening/closing shifts in pressure.
- B. Interior Rated Conditions: Provide rated access panels as specified “access panels for walls.”
- C. Sizes: 24 inches by 24 inches, unless otherwise shown.
- D. Hardware: Manufacturer's standard.

2.4 ACCESS DOORS FOR FLOORS

- A. Manufacturers: Babcock-Davis; Nystrom Inc; or equal accepted by the Architect.
 - 1. Type: Provide Babcock-Davis's B-FCRM Series, or equal accepted by the Architect; angle frame, aluminum insulated fire rated floor door.
 - 2. Layout: Single up-ward swinging door leaf with maximum 30-pound opening force.
 - 3. 2-hour fire rating tested to NFPA 288.
 - 4. Hatch width and length: 30-inches square.
 - 5. Fabricate floor hatch assemblies to support the following loads:
 - a. Live load: 150 pounds per square foot minimum.
 - 6. Location: Equipment Platforms, installed on raised concrete curb as shown on the Drawings.
- B. Materials:
 - 1. Door: 1/4-inch thick aluminum tread plate aluminum.
 - 2. Frame: 1/4-inch extruded structural aluminum angle frame with integral anchor straps for cast-in-place concrete.
 - 3. Finish: Mill Finish.
 - a. Apply 1 coat of epoxy paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.
- C. Hardware:
 - 1. Latch: Type 316 stainless steel slam latch with inside lever handle and outside removable “L” handle fastened to door with tamper-resistant stainless steel bolts.

2. Hinges: Type 316 stainless steel, heavy-duty butt hinges with stainless steel pin fastened to door with stainless steel carriage bolts.
3. Springs: Type 316 stainless steel compression lift springs designed to counterbalance door weight and resist downward pressure when closing door. Design springs to not exceed 30 pounds of force to operate.

2.5 EXTERIOR ACCESS PANELS

- A. Insulated Access Panel: Karp Model MX, as manufactured by Karp Associates, Inc., or equal. Custom size: 24 in. high by 36 in. wide. Material: stainless steel, type 316 with no. 6 non-directional finish. Doors shall be welded, watertight pan. Corners shall be welded and ground smooth.
 1. Gasketing: 3/8 in. wide by 1/8 in. thick neoprene.
 2. Insulation: 1 in. thick polystyrene. R value: 5 per inch.
 3. Hardware: Provide continuous stainless steel piano hinge and two latches from Southco Lift & Turn Compression Latch, or equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Advise installers of other work about specific requirements relating to access door installation, including sizes of openings to receive access door and frame, as well as locations of supports, inserts, and anchoring devices.
- B. Furnish inserts and anchoring devices for access doors that must be built into other construction.
- C. Coordinate delivery with other work to avoid delay.

3.3 INSTALLATION

- A. Comply with manufacturer's instructions for installing access doors.
- B. Set frames accurately in position, mud edges, and securely attach to supports with face panels plumb and level in relation to adjacent finish.
- C. Coordinate location of access doors in hung ceilings, furred spaces and walls to provide access to concealed work items requiring maintenance and/or adjustment. Obtain approval of the Architect for the locations of such access doors.
- D. Locate and group equipment requiring access doors. Coordinate location of equipment with other trades to minimize number of access doors in one area.

- E. Frames, doors and trim pieces shall not vary from straightness or snug contact fit by more than 1/16-inch.
- F. Provide access doors for maintenance or adjustment purposes for mechanical system components, including but not limited to the following:
 - 1. Valves.
 - 2. Dampers.
 - 3. Concealed equipment.

3.4 ADJUSTING

- A. Adjust and clean hardware and panels after installation for proper operation.
- B. Remove and replace panels or frames that are warped, bowed, or otherwise damaged.

3.5 CLEANING

- A. Clean and prepare doors for painting in accordance with Section 099100.
- B. Construction Waste Management: Manage construction waste in accordance with provisions of Section 01 7419 Construction Waste Management and Disposal. Submit documentation for Credit MRp2/MRc5 to satisfy the requirements of that Section.

3.6 FIELD QUALITY CONTROL

- A. Inspection Agency: Owner will engage a qualified inspector to perform inspections and to furnish reports to Architect for the inspection of each fire-rated access door in accordance with NFPA 80, Section 5.2.
- B. Inspections:
 - 1. Fire-Rated Door Inspections: Inspect each fire-rated access door in accordance with NFPA 80, Section 5.2.
- C. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.
- D. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.
- E. Prepare and submit separate inspection report for each fire-rated access door indicating compliance with each item listed in NFPA 80.

END OF SECTION

SECTION 08 36 00
OVERHEAD SECTIONAL DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.1 SUMMARY

- A. Section Includes:
 - 1. Electrically operated steel sectional overhead doors.
 - 2. Operating hardware, controls, and supports.
- B. Related Sections:
 - 1. Division 1: Administrative, procedural, and temporary work requirements.
 - 2. Section 09 91 00 "Painting and Coating" for field painting of doors.
 - 3. Division 26 for connection to power supply and control devices.

1.2 REFERENCES

- A. ASTM International (ASTM) A653/A653M-03 - Standard Specification for Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

1.3 SYSTEM DESCRIPTION

- A. Design doors to withstand:
 - 1. Positive and negative design wind loads in accordance with 2022 California Building Code.
 - 2. Cycle life of 25,000 cycles.
- B. Operation: Electric.
- C. Track and Operating Hardware: High lift, low headroom, types.

1.4 SUBMITTALS

- A. Closeout Submittals:
 - 1. Operation and Maintenance Data.

- B. Sustainable Design Submittals:
 - 1. Recycled products: Indicate percentage of recycled material used in manufacture of products, and percentage classified as post consumer.
 - 2. Regional products: Indicate location of product manufacturer and distance from manufacturer to project site.

1.5 WARRANTIES

- A. Provide manufacturer's one year warranty against defects in materials and workmanship.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Contract Documents are based on Model 3222 by C.H.I. Overhead Doors.
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Galvanized Steel Sheet:
 - 1. ASTM A653/A653M, Structural Quality, G60 coating class.
 - 2. Recycled content: Minimum 75 percent, with minimum 40 percent classified as post-consumer.

2.3 COMPONENTS

- A. Door Sections:
 - 1. Type: Deep ribbed, pan style.
 - 2. Material: Galvanized steel.
 - 3. Gauge: 20.
 - 4. Thickness: Nominally 2 inches.
 - 5. Rails: Tongue-and-groove.
 - 6. End caps: Wrap-around box style, 18 Gauge galvanized steel, full height of section, riveted to inside rails and face of door.
 - 7. Insulation: 1-1/2 inches thick, CFC-free polystyrene.
 - 8. Inside Face: 27 gauge galvanized steel, attached with plastic retainer clips.

- B. Tracks:
1. 2 inches wide, roll-formed galvanized steel, 16 gauge for doors up to 10 feet high, 14 gauge for doors exceeding 10 feet high.
 3. Lower track sections adjustable for weathertight fit.
 4. Horizontal tracks reinforced with minimum 13 gauge galvanized steel angle according to door weight and size.
- C. Hinge and Roller Assemblies: Heavy duty hinges and adjustable roller holders of galvanized steel, with floating hardened steel bearing rollers, located at top and bottom of each panel, each side.
- D. Spring Counterbalance:
1. Oil tempered torsion springs mounted on cross-header shaft supported by galvanized steel ball bearing end plates and center carrier brackets as required.
 2. Counterbalance transferred to doors via aircraft quality braided steel lift cables.
- E. Bottom Weatherstripping: Vinyl weatherseal, full width of door.
- F. Head and Jamb Weatherstripping: Flexible one piece vinyl extrusions.
- G. Lock: Inside slide type, adjustable keeper, spring activated.
- H. Electric Operator:
1. Power supply: As shown on Drawings.
 2. Sufficient power to operate door at average speed of 12 inches per second.
 3. Disconnect for manual push-up operation in case of power failure.
 4. Control station: As shown on Drawings.
- I. Safety Device: Electric edge; detect obstruction and reverse door upon contact with electric strips in vinyl housing.
- J. Finish:
1. Exterior panel surfaces: Powder Coated Finish [RAL].
 2. Interior panel surfaces: Baked-on polyester primer.

PART 3- EXECUTION

3.1 INSTALLATION

- A. Install door assembly in accordance with manufacturer's instructions.
- B. Anchor to adjacent construction without distortion or stress.
- C. Securely brace door tracks suspended from structure. Secure tracks to structural members only.
- D. Fit and align door assembly including hardware, level and plumb, to provide smooth operation.
- E. Position head and jamb weatherstripping to contact door sections when closed; secure in position.
- F. Make wiring connections between power supply and operator and between operator and controls.

3.2 ADJUSTING

- A. Adjust to operate smoothly throughout full operating range.

END OF SECTION

SECTION 08 41 13

ALUMINUM FRAMED STOREFRONTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes: Exterior all-glass entrance and storefront systems.
- B. Related Requirements:
 - 1. Section 07 92 00 "Joint Sealants."
 - 2. Section 08 80 00 "Glazing."

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For aluminum-framed exterior entrances and storefronts. Include plans, elevations, sections, full-size details, and attachments to other work.
 - 1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
 - 2. Include full-size isometric details of each vertical-to-horizontal intersection of aluminum-framed entrances and storefronts, showing the following:
 - a. Joinery, including concealed welds.
 - b. Anchorage.
 - c. Expansion provisions.
 - d. Glazing.
 - e. Flashing and drainage.
 - 3. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.

4. Show all parts of the assembly including integration with the surrounding construction.
 5. No materials shall be delivered to the site until shop drawings have been reviewed and accepted by Architect.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.
- E. Fabrication Sample: Of each vertical-to-horizontal intersection of assemblies, made from 12-inch lengths of full-size components and showing details of the following:
1. Joinery, including concealed welds.
 2. Anchorage.
 3. Expansion provisions.
 4. Glazing.
 5. Flashing and drainage.
- F. Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.
- G. Delegated-Design Submittal: For aluminum-framed entrances and storefronts indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- 1.5 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For Installer.
- B. Energy Performance Certificates: For aluminum-framed entrances and storefronts, accessories, and components, from manufacturer.
1. Basis for Certification: NFRC-certified energy performance values for each aluminum-framed entrance and storefront.
- C. Product Test Reports: For aluminum-framed entrances and storefronts, for tests performed by manufacturer and witnessed by a qualified testing agency.
- D. Quality-Control Program: Developed specifically for Project, including fabrication and installation, according to recommendations in ASTM C 1401. Include periodic quality-control reports.
- E. Source quality-control reports.
- F. Field quality-control reports.
- G. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For aluminum-framed entrances and storefronts to include in maintenance manuals.
- B. Maintenance Data for Structural Sealant: For structural-sealant-glazed storefront to include in maintenance manuals. Include ASTM C 1401 recommendations for post-installation-phase quality-control program.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
 - 1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.
- C. Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
 - 1. Build mockup of typical all-glass system as indicated on Drawings.
 - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 WARRANTY

- A. Special Warranty: Installer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including, but not limited to, excessive deflection.
 - b. Noise or vibration created by wind and thermal and structural movements.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - d. Water penetration through fixed glazing and framing areas.
 - e. Failure of operating components.
 - 2. Warranty Period: 10 years from date of Substantial Completion.
- B. Special Warranty on Aluminum Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace components of aluminum-framed entrances

and storefronts that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, 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 paint to adhere to bare metal.
2. Finish Warranty Period: 5 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
 1. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure, including, but not limited to, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
 2. Failure also includes the following:
 - a. Thermal stresses transferring to building structure.
 - b. Glass breakage.
 - c. Noise or vibration created by wind and thermal and structural movements.
 - d. Loosening or weakening of fasteners, attachments, and other components.
 - e. Failure of operating units.
- B. Structural Loads:
 1. Wind Loads: As indicated on Drawings.
 2. Other Design Loads: As indicated on Drawings.
- C. Deflection of Framing Members: At design wind pressure, as follows:
 1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding 1/175 of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
 2. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch, whichever is smaller.
 - a. Operable Units: Provide a minimum 1/16-inch clearance between framing members and operable units.

- D. Structural: Test according to ASTM E330/E330M as follows:
1. When tested at positive and negative wind-load design pressures, storefront assemblies, including entrance doors, do not evidence deflection exceeding specified limits.
- E. Air Infiltration: Test according to ASTM E283 for infiltration as follows:
1. Fixed Framing and Glass Area:
 - a. Maximum air leakage of 0.06 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.
 2. Entrance Doors:
 - a. Single Doors: Maximum air leakage of 0.5 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.
- F. Water Penetration under Static Pressure: Test according to ASTM E331 as follows:
1. No evidence of water penetration through fixed glazing and framing areas, including entrance doors, when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 8.0 lbf/sq. ft.
- G. Water Penetration under Dynamic Pressure: Test according to AAMA 501.1 as follows:
1. No evidence of water penetration through fixed glazing and framing areas when tested at dynamic pressure equal to 20 percent of positive wind-load design pressure, but not less than 8.0 lbf/sq. ft.
 2. Maximum Water Leakage: No uncontrolled water penetrating assemblies or water appearing on assemblies' normally exposed interior surfaces from sources other than condensation. Water leakage does not include water controlled by flashing and gutters, or water that is drained to exterior.
- H. Seismic Performance: Aluminum-framed entrances and storefronts shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
1. Seismic Drift Causing Glass Fallout: Complying with criteria for passing based on building occupancy type when tested according to AAMA 501.6 at design displacement.
- I. Energy Performance: Certify and label energy performance according to NFRC as follows:
1. Thermal Transmittance (U-factor): Fixed glazing and framing areas as a system shall have U-factor of not more than 0.41 Btu/sq. ft. x h x deg as determined according to NFRC 100.
 2. Solar Heat Gain Coefficient (SHGC): Fixed glazing and framing areas as a system shall have SHGC of no greater than 0.26 as determined according to NFRC 200.
 3. Condensation Resistance: Fixed glazing and framing areas as a system shall have an NFRC-certified condensation resistance rating of no less than 15 as determined according to NFRC 500.

- J. Noise Reduction: Test according to ASTM E90, with ratings determined by ASTM E1332, as follows.
 - 1. Outdoor-Indoor Transmission Class: Minimum 26.
- K. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 MANUFACTURERS

- A. Exterior aluminum-framed storefront
 - 1. Basis of Design: Oldcastle, screw-spline.
 - 2. Other Acceptable Manufacturers:
 - a. Kawneer.
 - b. EFCO.
 - c. Substitutions: See Section 01 60 00 - Product Requirements.

2.3 COMPONENTS

- A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
 - 1. Finish: High performance organic coating.
 - 2. Color: As selected from manufacturer's standards.
 - a. Interior color different from exterior color.
- B. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
 - 1. Framing members for interior applications need not be thermally broken.
 - 2. Glazing stops: Flush.
 - 3. Cross-Section: 2 x 4-1/2-inch nominal dimension.
 - 4. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member as required by wind loading.
- C. Doors: Glazed aluminum.
 - 1. Basis of Design: Medium Style Doors by Oldcastle.
 - 2. Thickness: 1-3/4 inches.
 - 3. Top Rail: 4 inches wide.
 - 4. Vertical Stiles: 4-1/2 inches wide.
 - 5. Bottom Rail: 12 inches wide.
 - 6. Glazing Stops: Square.
 - 7. Finish: Same as storefront.

2.4 MATERIALS

- A. Extruded Aluminum: ASTM B221.
- B. Fasteners: Stainless steel.
- C. Exposed Flashings: 0.032-inch-thick aluminum sheet; finish to match framing members.
- D. Perimeter Sealant: Type SJ-8 specified in Section 07 92 00.

- E. Glass: As specified in Section 08 80 00.
 - 1. Glass in Exterior Framing: As indicated on drawings.
 - 2. Glass in Interior Framing: As indicated on drawings.
- F. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

2.5 FINISHES

- A. High Performance Organic Finish: AAMA 2604; multiple coats, thermally cured fluoropolymer system; color to match Architect's sample for metal panels.

2.6 HARDWARE

- A. Door Hardware: As specified in Section 08 71 00.
- B. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.
- C. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.

2.7 FABRICATION

- A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly yet enabling installation and dynamic movement of perimeter seal.
- B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
- C. Prepare components to receive anchor devices. Fabricate anchors.
- D. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
- E. Arrange fasteners and attachments to conceal from view.
- F. Reinforce components internally for door hardware.
- G. Reinforce framing members for imposed loads.
- H. Finishing: Apply factory finish to all surfaces that will be exposed in completed assemblies.
 - 1. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare surfaces that are in contact with structural sealant according to sealant manufacturer's written instructions to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.

3.3 INSTALLATION

A. General:

1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure nonmovement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
6. Seal perimeter and other joints watertight unless otherwise indicated.

B. Metal Protection:

1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

- C. Set continuous sill members and flashing in full sealant bed as specified in Section 07 92 00 "Joint Sealants" to produce weathertight installation.

- D. Install components plumb and true in alignment with established lines and grades.

- E. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.

- F. Install glazing as specified in Section 08 80 00 "Glazing."

- G. Install weatherseal sealant according to Section 07 92 00 "Joint Sealants" and according to sealant manufacturer's written instructions to produce weatherproof joints. Install joint filler behind sealant as recommended by sealant manufacturer.

- H. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.

1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

3.4 ERECTION TOLERANCES

- A. Erection Tolerances: Install aluminum-framed entrances and storefronts to comply with the following maximum tolerances:
1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
 2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
 3. Alignment:
 - a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
 - b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
 - c. Where surfaces are separated by reveal or protruding element of 1 inch wide or more, limit offset from true alignment to 1/4 inch.
 4. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Field Quality-Control Testing: Perform the following test on representative areas of aluminum-framed entrances and storefronts.
1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.
 - a. Perform a minimum of three tests in areas as directed by Architect.
 - b. Perform tests in each test area as directed by Architect. Perform at least three tests, prior to 10, 35, and 70 percent completion.
 - c. Test areas shall be 10'-0" x 10'-0". Additional testing is excluded.
- C. Structural-Sealant Adhesion: Test structural sealant according to recommendations in ASTM C 1401, Destructive Test Method A, "Hand Pull Tab (Destructive)," Appendix X2.
1. Test a minimum of four areas on each building facade.
 2. Perform 10 adhesion tests. Additional tests are excluded.
 3. Repair installation areas damaged by testing.
- D. Aluminum-framed entrances and storefronts will be considered defective if they do not pass tests and inspections. Contractor shall repair exterior entrances and storefronts as required to meet testing, with no additional cost to the Owner.
- E. Prepare test and inspection reports.
- F. Egress Door Inspections: Inspect each all-glass entrance door equipped with panic hardware, each all-glass entrance door located in an exit enclosure, each electrically

controlled all-glass egress door, and each all-glass entrance door equipped with special locking arrangements, according to NFPA 101, Section 7.2.1.15.

3.6 MAINTENANCE SERVICE

A. Entrance Door Hardware:

1. 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 entrance door hardware.

END OF SECTION

SECTION 08 51 13
ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes aluminum windows for exterior locations.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 2. Review and discuss the finishing of aluminum windows that is required to be coordinated with the finishing of other aluminum work for color and finish matching.
 - 3. Review, discuss, and coordinate the interrelationship of aluminum windows with other exterior wall components. Include provisions for anchoring, flashing, weeping, sealing perimeters, and protecting finishes.
 - 4. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
 - 5. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, glazing and fabrication methods, dimensions of individual components and profiles, hardware, and finishes for aluminum windows.
- B. Shop Drawings: For aluminum windows.
 - 1. Include project-specific plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant installation.
 - 2. Include project-specific details demonstrating watertight integration with adjoining systems.
- C. Samples: For each exposed product and for each color specified, 2 by 4 inches in size.

- D. Product Schedule: For aluminum windows. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer and Installer.
- B. Product Test Reports: For each type of aluminum window, for tests performed by a qualified testing agency.
- C. Field quality-control reports.
- D. Sample Warranties: For manufacturer's warranties.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer capable of fabricating aluminum windows that meet or exceed performance requirements indicated and of documenting this performance by test reports and calculations.
- B. Installer Qualifications: An installer acceptable to aluminum window manufacturer for installation of units required for this Project.
- C. Mockup: Provide a stand-alone project specific mock-up comprising of typical and complex flashings, air/water-resistive barrier integration, and each cladding and fenestration system type. Performance mock-up shall be tested by a qualified, independent, third-party QA test agency for water penetration resistance per AAMA 501.2 and ASTM E1105.

1.7 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace aluminum windows that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Failure to meet performance requirements.
 - b. Structural failures including excessive deflection, water leakage, condensation, and air infiltration.
 - c. Faulty operation of movable sash and hardware.
 - d. Deterioration of materials and finishes beyond normal weathering.
 - e. Failure of insulating glass.
 - 2. Warranty Period:
 - a. Window: Ten (10) years from date of Substantial Completion.
 - b. Glazing Units: Ten (10) years from date of Substantial Completion.
 - c. Aluminum Finish: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.

1. Window Certification: AAMA certified with label attached to each window.

Windows shall meet or exceed the air and water infiltration requirements for the following Performance Class and Grades in accordance with the American Architectural Manufacturers Association (AAMA) 101/I.S. 2/NAFS-02, "Voluntary Performance Specifications for Windows, Skylights and Glass Doors."

2. Air Infiltration: after the AAMA 910 life cycle test, meet AAMA 101 standard of maximum 0.10 cfm/ft² when tested per ASTM E 283 at a static air pressure differential of 6.24 psf (300 PA).
3. Water Penetration: after the AAMA 910 life cycle test, no uncontrolled water leakage when tested per ASTM E 547 and ASTM E 331 at a static air pressure differential of 15 psf (720 PA).
4. Uniform Deflection: no more than L/175 when tested per ASTM E 330 at a static air pressure differential of 80 psf (3840 PA).
5. Uniform Structural: window to be operable, and maximum .2% permanent deformation per member when tested per ASTM E 330 at a static air pressure differential of 120 psf (5748 PA).
6. Component Testing: Window components shall be tested in accordance with procedures described in ANSI AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS).
7. Energy Efficiency: U-Factor not more than ____ BTU/hr/sf/°F per AAMA 507 or NFRC100 when using project specified glass.
8. Condensation Resistance Test (CRF): When tested in accordance with AAMA 1503, the condensation resistance factor (CRF) shall not be less than:

2.2 MANUFACTURER

- A. Source Limitations: Obtain aluminum windows from single source from single manufacturer.
- B. Basis of Design: Kawneer "Series AA 4325 "OptiQ" Ultra Thermal Windows" or equal.

1. Class: AW-PG80-AP.
2. Frame Depth: 3-1/4 inches.
3. Configuration: Awning/Project-Out.

4. Operation: As scheduled on Drawings.

2.3 ALUMINUM WINDOWS

- A. Frame and Sash: ASTM B221, extruded aluminum 6063-T5 alloy.
- B. Fasteners and Miscellaneous Fastening Devices: Aluminum, stainless steel, or other non-corroding and non-corrosive material compatible with aluminum.
- C. Concealed Gaskets: Molded expanded EDPM or neoprene complying with ASTM C509.
- D. Glazing:
 1. Glass: As scheduled on the Drawings for each opening and complying with Section 08 80 00 "Glazing".
 2. Glazing Gaskets: Standard of manufacturer.
- E. Sealants:
 1. Use only nonhardening, nonshrinking, and nonmigrating materials.
 2. For nonworking metal-to-metal joints within framing members, use small joint sealant, conforming to 803.3 as described in AAMA 800.
 3. Perimeter Sealants: As specified in Section 07 92 00 "Joint Sealers."
- F. Brake Metal Trim: Minimum 22 gage sheet aluminum of sizes and shapes shown and required finished to match aluminum windows.
- G. Screens: Not required.

2.4 ACCESSORIES

- A. Subsills: Nonthermal, extruded-aluminum subsills in configurations indicated on Drawings.

Receptor System: Two-piece, snap-together, thermally broken, extruded-aluminum receptor system that anchors windows in place.

Dissimilar Metal Coating: Cold-applied asphalt mastic, zinc chromate paint, or other nonconductive, non-absorptive material.

2.5 WINDOW HARDWARE

- A. Auxiliary Locks: Provide an auxiliary non-keyed locking device for operable units.

Latches and Handles: Cast white bronze or equal approved by City's Representative. Provide with pole ring at project-in windows.

Weatherstripping: As standard with manufacturer to meet specified performance criteria and conforming to AAMA 701.2.

2.6 FABRICATION

- A. Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.

Glaze aluminum windows in the factory.

Weep Holes: Provide weep holes and internal passages to conduct infiltrating water to exterior.

Provide water-shed members above side-hinged sashes and similar lines of natural water penetration.

Mullions: Provide mullions and cover plates, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections. Provide mullions and cover plates capable of withstanding design wind loads of window units.

Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation.

2.7 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual" for recommendations for applying and designating finishes.

Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.8 ALUMINUM FINISHES

- A. High-Performance Organic Finish (Three-Coat Fluoropolymer): AA-C12C40R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: conversion coatings; Organic Coating: manufacturer's standard three-coat, thermocured system consisting of specially formulated inhibitive primer, fluoropolymer color coat, and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with AAMA 2605 and with coating and resin manufacturers' written instructions.

1. Color and Gloss: Custom to match Architect's sample.

PART 2 - EXECUTION

2.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Verify rough opening dimensions, levelness of sill plate, and operational clearances.
- C. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure weathertight window installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

2.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E2112.
- B. Install windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.
- C. Install windows and components to drain condensation, water penetrating joints, and moisture migrating within windows to the exterior.
- D. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

2.3 FIELD QUALITY CONTROL

- A. Testing Agency: The Owner shall engage a qualified testing agency to perform tests and inspections.
 - 1. Testing and inspecting agency will interpret tests and state in each report whether tested work complies with or deviates from requirements.
- B. Testing Services: Testing and inspecting of installed windows shall take place as follows:
 - 1. Testing Methodology: Testing of windows for air infiltration and water resistance shall be performed according to AAMA 502.
 - 2. Air-Infiltration Testing:
 - a. Test Pressure: That required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance class indicated.

- b. Allowable Air-Leakage Rate: 1.5 times the applicable AAMA/WDMA/CSA 101/I.S.2/A440 rate for product type and performance class rounded down to one decimal place.
 3. Water-Resistance Testing:
 - a. Test Pressure: Two-thirds times test pressure required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance grade indicated.
 - b. Allowable Water Infiltration: No water penetration.
 4. Testing Extent: 5 (five) percent, but no less than 5 (five) windows of each type as selected by Architect and a qualified independent testing agency, with at least 1 (one) window located on each elevation. Windows shall be tested after perimeter sealants have cured at least 21 days.
 - a. Each test area shall include perimeter conditions.
 - b. Provide interior and exterior access, power, and water supply to perform tests, including repeat unsuccessful tests after remedial work.
 5. Test Reports: Prepared according to AAMA 502.
 - C. Windows will be considered defective if they do not pass tests and inspections.
 1. For each failed test that exhibits water penetration; repair or replace, and retest the deficient location and test 2 (two) additional windows with similar configurations at no additional cost to Owner
 - D. Prepare test and inspection reports.
- 2.4 ADJUSTING, CLEANING, AND PROTECTION
- A. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.
 - B. Clean exposed surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
 1. Keep protective films and coverings in place until final cleaning.
 - C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
 - D. Protect window surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written instructions.

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. This Section includes items known commercially as finish or door hardware that are required for swing, sliding, and folding doors, except special types of unique hardware specified in the same sections as the doors and door frames on which they are installed.

- B. This Section includes the following, but is not necessarily limited to:

1. Door Hardware, including electric hardware.
2. Storefront and Entrance door hardware.
3. Gate Hardware.
4. Digital keypad access control devices.
5. Hold-open closers with smoke detectors.
6. Wall or floor-mounted electromagnetic hold-open devices.
7. Power supplies for electric hardware.
8. Low-energy door operators plus sensors and actuators.
9. Thresholds, gasketing and weather-stripping.
10. Door silencers or mutes.

- C. Related Sections: The following sections are noted as containing requirements that relate to this Section, but may not be limited to this listing.

1. Division 8: Section - Steel Doors and Frames.
2. Division 8: Section - Wood Doors.
3. Division 8: Section - Aluminum Storefront
4. Division 28: Section - Fire/Life-Safety Systems & Security Access Systems.

1.03 REFERENCES (USE DATE OF STANDARD IN EFFECT AS OF BID DATE.)

- A. 2022 California Building Code, CCR, Title 24.
- B. BHMA – Builders' Hardware Manufacturers Association
- C. CCR – California Code of Regulations, Title 24, Part 2, California State Accessibility Standards.
- D. DHI – Door and Hardware Institute
- E. NFPA - National Fire Protection Association.

1. NFPA 80 - Fire Doors and Other Opening Protectives
2. NFPA 105 - Smoke and Draft Control Door Assemblies

F. UL - Underwriters Laboratories.

1. UL 10C - Fire Tests of Door Assemblies
2. UL 305 - Panic Hardware

G. WHI - Warnock Hersey Incorporated

H. SDI - Steel Door Institute

1.04 SUBMITTALS & SUBSTITUTIONS

- A. General: Submit in accordance with Conditions of the Contract and Division 1 Specification sections.
- B. Submit product data (catalog cuts) including manufacturers' technical product information for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
- C. Submit six (6) copies of schedule organized vertically into "Hardware Sets" with index of doors and headings, indicating complete designations of every item required for each door or opening. Include following information:
 1. Include a Cover Sheet with
 - a. Job Name, location, telephone number.
 - b. Architects name, location and telephone number.
 - c. Contractors name, location, telephone number and job number.
 - d. Suppliers name, location, telephone number and job number.
 - e. Hardware consultant's name, location and telephone number.
 2. Job Index information included
 - a. Numerical door number index including door number, hardware heading number and page number.
 - b. Complete keying information (referred to DHI hand-book "Keying Systems and Nomenclature"). Provision should be made in the schedule to provide keying information when available if it is not available at the time the preliminary schedule is submitted.
 - c. Manufacturers' names and abbreviations for all materials.
 - d. Explanation of abbreviations, symbols, and codes used in the schedule.
 - e. Mounting locations for hardware.
 - f. Clarification statements or questions.
 - g. Catalog cuts and manufacturer's technical data and instructions.
 3. Vertical schedule format sample:

Heading Number 1 (Hardware group or set number – HW -1)					
			(a) 1 Single Door #1 - Exterior from Corridor 101	(b) 90°	(c) RH

			(d) 3' 0"x7' 0" x 1-3/4" x (e) 20 Minute (f) WD x HM		
(g) 1	(h)	(i) ea	(j) Hinges - (k) 5BB1HW 4.5 x 4.5 NRP (l) □ TMS	(m) 626	(n) IVE
2	6AA	1 ea	Lockset - ND50PD x RHO x RH x 10-025 x JTMS	626	SCH

(a) - Single or pair with opening number and location. (b) - Degree of opening (c) - Hand of door(s) (d) - Door and frame dimensions and door thickness. (e) - Label requirements if any. (f) - Door by frame material. (g) - (Optional) Hardware item line #. (h) - Eysset Symbol. (i) - Quantity. (j) - Product description. (k) - Product Number. (l) - Fastenings and other pertinent information. (m) - Hardware finish codes per ANSI A156.18. (n) - Manufacture abbreviation.

- D. Make substitution requests in accordance with Division 1. Substitution requests must be made prior to bid date. Include product data and indicate benefit to the project. Furnish samples of any proposed substitution.
- E. Wiring Diagrams: Provide product data and wiring and riser diagrams for all electrical products listed in the Hardware Schedule portion of this section.
- F. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.
- G. Templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- H. Furnish as-built/as-installed schedule with close-out documents, including keying schedule and transcript, wiring/riser diagrams, manufacturers' installation and adjustment and maintenance information.
- I. Fire Door Assembly Testing: Submit a written record of each fire door assembly to the Owner to be made available to the Authority Having Jurisdiction (AHJ) for future building inspections.
- J. LEED Certification Points: Submit information and certifications necessary to achieve maximum points for LEED certification coordinate and cooperate with Owner and Architect in providing information necessary for required LEED rating.

1.05 QUALITY ASSURANCE

- A. Obtain each type of hardware (latch and lock sets, hinges, closers, exit devices, etc.) from a single manufacturer.
- B. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this project and that employs an experienced architectural hardware consultant (AHC) who is available to Owner, Architect, and Contractor, at reasonable times during the course of the Work, for consultation.

1. Responsible for detailing, scheduling and ordering of finish hardware.
 2. Meet with Owner to finalize keying requirements and to obtain final instructions in writing. To maintain the integrity of patented key systems provide a letter of authorization from the specified manufacturer indicating that supplier has authorization to purchase the key system directly from the manufacturer.
 3. Stock parts for products supplied and are capable of repairing and replacing hardware items found defective within warranty periods.
- C. Hardware Installer: Company specializing in the installation of commercial door hardware with five years documented experience.
- D. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA Standard No. 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and tested by UL or Warnock Hersey for given type/size opening and degree of label. Provide proper latching hardware, door closers, approved-bearing hinges and seals whether listed in the Hardware Schedule or not.
1. Where emergency exit devices are required on fire-rated doors, (with supplementary marking on doors' UL labels indicating "Fire Door to be Equipped with Fire Exit Hardware") provide UL label on exit devices indicating "Fire Exit Hardware".
- E. Exit Doors: Operable from inside with single motion without the use of a key or special knowledge or effort.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Coordinate delivery of packaged hardware items to the appropriate locations (shop or field) for installation.
- B. Hardware items shall be individually packaged in manufacturers' original containers, complete with proper fasteners. Clearly mark packages on outside to indicate contents and locations in hardware schedule and in work.
- C. Provide locked storage area for hardware, protect from moisture, sunlight, paint, chemicals, etc.
- D. Contractor to inventory door hardware jointly with representatives of hardware supplier and hardware installer until each all are satisfied that count is correct.
- E. Exit Doors: Operable from inside with single motion without the use of a key or special knowledge or effort.
- F. Product packaging to be labelled in compliance with CA Prop 65, Safe Drinking Water and Toxic Enforcement Act of 1986.

1.07 WARRANTY

- A. Provide warranties of respective manufacturers' regular terms of sale from day of final acceptance as follows:
1. Locksets: "ND" Ten (10) years.

2. Electronic: One (1) year.
3. Closers: Thirty (30) years –1461 twenty (20) years.
4. Exit devices: Three (3) years.
5. All other hardware: Two (2) years.

1.08 MAINTENANCE

- 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.

1.09 PRE-INSTALLATION CONFERENCE

- A. Convene a pre-installation conference at least one week prior to beginning work of this section.
- B. Attendance: Architect, Construction Manager, Contractor, Security Contractor, Hardware Supplier, Installer, Key District Personnel, and Project Inspector.
- C. Agenda: Review hardware schedule, products, installation procedures and coordination required with related work. Review District's keying standards.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

<u>Item</u>	<u>Manufacturer</u>	<u>Acceptable Substitutes</u>
Hinges	Ives	Hager, Stanley, McKinney
Locks, Latches & Cylinders	Schlage	No Substitutions
Exit Devices	Von Duprin	No Substitutions
Closers	LCN	Or Approved Equal
Push, Pulls & Protection Plates	Ives	Trimco, BBW, DCI
Flush Bolts	Ives	Trimco, BBW, DCI
Dust Proof Strikes	Ives	Trimco, BBW, DCI
Coordinators	Ives	Trimco, BBW, DCI
Stops	Ives	Trimco, BBW, DCI
Overhead Stops	Glynn-Johnson	Or Approved Equal
Thresholds	National Guard	No Substitutions

Seals & Bottoms

National Guard

No Substitutions

2.02 MATERIALS

- A. Hinges: Exterior out-swinging door butts shall be non-ferrous material and shall have stainless steel hinge pins. All doors to have non-rising pins.
1. Hinges shall be sized in accordance with the following:
 - a. Height:
 - 1) Doors up to 42" wide: 4-1/2" inches.
 - 2) Doors 43" to 48" wide: 5 inches.
 - b. Width: Sufficient to clear frame and trim when door swings 180 degrees.
 - c. Number of Hinges: Furnish 3 hinges per leaf to 7'-5" in height. Add one for each additional 2 feet in height.
 2. Furnish non-removable pins (NRP) at all exterior out-swing doors and interior key lock doors with reverse bevels.
- B. Floor Closers: Shall be equipped with compression springs, cam and roller operating mechanism and a one piece spindle-cam for maximum operating performance and longevity.
- C. Pivots: High strength forgings and castings with precision bearings for smooth operation. Positive locking vertical adjustment mechanism to allow installer to precisely position the door and balance the load.
- D. Continuous Hinges: As manufactured by Ives, an Allegion Company. UL rated as required.
- E. Heavy Duty Cylindrical Locks and Latches: Schlage "ND" Series as scheduled with "Rhodes" design, fastened with through-bolts and threaded chassis hubs.
1. Provide cylindrical locksets exceeding the ANSI/BHMA A156.2 Grade 1 performance standards for strength, security, and durability in the categories below:
 - a. Abusive Locked Lever Torque Test – minimum 3,100 inch-pounds without gaining access
 - b. Offset lever pull – minimum 1,600 foot pounds without gaining access
 - c. Vertical lever impact – minimum 100 impacts without gaining access
 2. Cycle life - tested to minimum 16 million cycles per ANSI/BHMA A156.2 Cycle Test with no visible lever sag or use of performance aids such as set screws or spacers
 3. UL 10C for 4'-0" x 10'-0" 3-hour fire door.
 4. Cylinders: Refer to "KEYING" article, herein.
 5. Provide solid steel anti-rotation through bolts and posts to control excessive rotation of lever.
 6. Provide lockset that allows lock function to be changed to over twenty other common functions by swapping easily accessible parts.
 7. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2 inch latch throw capable of UL listing of 3 hours on a 4' x 10' opening. Provide proper latch throw for UL listing at pairs.
 8. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
 9. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
 10. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.

11. Provide wired electrified options as scheduled in the hardware sets.
 - a. 12 through 24 volt DC operating capability, auto-detecting
 - b. Selectable EL (fail safe)/EU (fail secure) operating mode via switch on chassis
 - c. 0.230A (230mA) maximum current draw
 - d. 0.010A (10mA) holding current
 - e. Modular / "plug in" request to exit switch
 12. Lever Trim: Solid cast levers without plastic inserts, and wrought roses on both sides.
- F. Deadlocks: Rotating cylinder trim rings of attack-resistant design. Mounting plates and actuator shields of plated cold-rolled steel. Mounting screws of ¼" diameter steel and protected by drill-resistant ball bearings. Steel alloy deadbolt with hardened steel roller. Strike alloy deadbolt with reinforcer and two 3" long screws. ANSI A156.5, 2001 Grade 1 certified.
- G. Exit devices: Von Duprin as scheduled.
1. Provide certificate by independent testing laboratory that device has completed over 1,000,000 cycles and can still meet ANSI/BHMA A156.3 - 2001 standards.
 2. All internal parts shall be of cold-rolled steel with zinc dichromate coating.
 3. Mechanism case shall have an average thickness of .140".
 4. Compression spring engineering.
 5. Non-handed basic device design with center case interchangeable with all functions.
 6. All devices shall have quiet return fluid dampeners.
 7. All latchbolts shall be deadlocking with ¾" throw and have a self-lubricating coating to reduce friction and wear.
 8. Device shall bear UL label for fire and or panic as may be required.
 9. All surface strikes shall be roller type and utilize a plate underneath to prevent movement.
 10. Lever Trim: "Breakaway" design, forged brass or bronze escutcheon with a minimum of .130" thickness, match lockset lever design.
 11. Removable Mullions: Removable with single turn of building key. Securely reinstalled without need for key.
 12. Furnish glass bead kits for vision lites where required.
 13. All Exit Devices to be sex-bolted to the doors.
 14. Panic Hardware shall comply with CBC Section 11B.404.2.7 and shall be mounted between 34" and 44" above the finished floor surface.
 - a. Provide exit devices UL certified to meet maximum 5 pound requirements according to the California Building Code section 11B-309.4, and UL listed for Panic Exterior Fire Exit Hardware maximum opening force of 15 pounds according to the California Building Code section 11B-404.2.9.
- H. Closers: LCN as scheduled. Place closers inside building, stairs, room, etc.
1. Door closer cylinders shall be of high strength cast iron construction with double heat treated pinion shaft to provide low wear operating capabilities of internal parts throughout the life of the installation. All door closers shall be tested to ANSI/BHMA A156.4 test requirements by a BHMA certified testing laboratory. A written certification showing successful completion of a minimum of 10,000,000 cycles must be provided.
 2. All door closers shall be fully hydraulic and have full rack and pinion action with a shaft diameter of a minimum of 11/16 inch and piston diameter of 1 inch to ensure longevity and durability under all closer applications.

3. All parallel arm closers shall incorporate one piece solid forged steel arms with bronze bushings. 1-9/16" steel stud shoulder bolts, shall be incorporated in regular arms, hold-open arms, arms with hold open and stop built in. All other closers to have forged steel main arms for strength, durability, and aesthetics for versatility of trim accommodation, high strength and long life.
 4. All parallel arm closers so detailed shall provide advanced backcheck for doors subject to severe abuse or extreme wind conditions. This advanced backcheck shall be located to begin cushioning the opening swing of the door at approximately 45 degrees. The intensity of the backcheck shall be fully adjustable by tamper resistant non-critical screw valve.
 5. Closers shall be installed to permit doors to swing 180 degrees.
 6. All closers shall utilize a stable fluid withstanding temperature range of 120 degrees F. to -30 degrees F. without requiring seasonal adjustment of closer speed to properly close the door.
 7. Provide the manufactures drop plates, brackets and spacers as required at narrow head rails and special frame conditions. NO wood plates or spacers will be allowed.
 8. Maximum effort to operate closers shall not exceed 5 lbs., such pull or push effort being applied at right angles to hinged doors. Compensating devices or automatic door operators may be utilized to meet the above standards. When fire doors are required, the maximum effort to operate the closer may be increased but shall not exceed 15 lbs. when specifically approved by fire marshal. All closers shall be adjusted to operate with the minimum amount of opening force and still close and latch the door. 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. Per 11B-404.2.8.1, door shall take at least 5 seconds to move from an open position of 90 degrees to a position of 12 degrees from the latch jamb.
- I. Flush Bolts & Dust Proof Strikes: Automatic Flush Bolts shall be of the low operating force design. Utilize the top bolt only model for interior doors where applicable and as permitted by testing procedures.
1. Manual flush bolts only permitted on storage or mechanical openings as scheduled.
 2. Provide dust proof strikes at openings using bottom bolts.
- J. Door Stops:
1. Unless otherwise noted in Hardware Sets, provide floor type with appropriate fasteners. Where wall type cannot be used, provide floor type. If neither can be used, provide overhead type.
 2. Do not install floor stops more than four (4) inches from the face of the wall or partition (CBC Section 11B-307).
 3. Overhead stops shall be made of stainless steel and non-plastic mechanisms and finished metal end caps. Field-changeable hold-open, friction and stop-only functions.
- . Protection Plates: Fabricate either kick, armor, or mop plates with four beveled edges. Provide kick plates 10" high and 2" LDW. Sizes of armor and mop plates shall be listed in the Hardware Schedule. Furnish with machine or wood screws of bronze or stainless to match other hardware.
- L. Thresholds: As Scheduled and per details.
1. Thresholds shall not exceed 1/2" in height, with a beveled surface of 1:2 maximum slope.

2. Set thresholds in a full bed of butyl-rubber or polyisobutylene mastic sealant complying with requirements in Division 7 "Thermal and Moisture Protection".
 3. Use ¼" fasteners, red-head flat-head sleeve anchors (SS/FHSL).
 4. Thresholds shall comply with CBC Section 11B-404.2.5.
- M. Seals: Provide silicone gasket at all rated and exterior doors.
1. Fire-rated Doors, Resilient Seals: UL10C Classified complies with NFPA 80 & NFPA 252. Coordinate with selected door manufacturers' and selected frame manufacturers' requirements.
 2. Fire-rated Doors, Intumescent Seals: Furnished by selected door manufacturer. Furnish fire-labeled opening assembly complete and in full compliance with UL10C Classified complies with NFPA 80 & NFPA 252. Where required, intumescent seals vary in requirement by door type and door manufacture -- careful coordination required.
 3. Smoke & Draft Control Doors, Provide UL10C Classified complies with NFPA 80 & NFPA 252 for use on "S" labeled Positive Pressure door assemblies.
- N. Door Shoes & Door Top Caps: Provide door shoes at all exterior wood doors and top caps at all exterior out-swing doors.
- O. Silencers: Furnish silencers for interior hollow metal frames, 3 for single doors, 2 for pairs of doors. Omit where sound or light seals occurs, or for fire-resistive-rated door assemblies.

2.03 EYING

- A. Furnish all cylinders in the Schlage Full Size Interchangeable Core (FSIC). Pack change keys independently (P I)
- B. Furnish PrimusXP "Everest-D" Patent Protected Schlage cylinders and keys for all locks except as noted. Furnish all other cylinders in matching "Everest-C" keyway. (e.g. Primus XP "Everest-D" keyway).
- C. Furnish construction keying for doors requiring locking during construction.
1. For FSIC systems provide 23-030-ICX Full Size Construction Cores
 2. For FSIC systems provide ten 48-101-ICX Construction keys
 3. For FSIC systems provide two 48-056-ICX Control keys (const.)
 4. For FSIC systems provide two control keys for installing the permanent cores (49-056 for "Classic" keyways, 48-052-XP for "Classic Primus") (49-003 for "Everest Conventional", 48-005-XP for "Everest Primus")
- D. Furnish all keys with visual key control.
1. Stamp key "Do Not Duplicate".
 2. Stamp unique owner identifier from the key bow.
- E. Furnish all cylinders with visual key control.
1. Stamp unique owner supplied code on cylinder side. (C C) (6 character maximum).
- F. Furnish mechanical keys as follows:

1. Furnish 2 cut change keys for each different change key code.
 2. Furnish 1 uncut key blank for each change key code.
 3. Furnish 6 cut masterkeys for each different masterkey set.
 4. Furnish 3 uncut key blanks for each masterkey set.
 5. Furnish 2 cut control keys cut to the top masterkey for permanent I/C cylinders.
 6. Furnish 1 cut control key cut to each S D combination.
- G. Furnish Schlage Padlocks and the cylinders to tie them into the masterkey system for gates, storage boxes, utility valve security, roof hatches and roll-up doors keyed as directed in the keying schedule.
1. Furnish S43D2200 padlock for use with non-I/C Schlage cylinders. Furnish 47-413 (conventional) or 47-743-XP (PrimusXP) with above.
 2. Furnish S43G3200 padlock for use with FSIC Schlage cylinders. Furnish 23-030 (Classic / Everest) or 20-740 (PrimusXP) with above.
 3. Furnish S41D1200 padlock for use with SFIC Schlage cylinders. Furnish 80-037 (Everest-B) with above.
- H. Furnish one Schlage cabinet lock for each cabinet door or drawer so designated on the drawings or keying schedule to match the masterkey system.
1. Furnish CL100PB for use with non-I/C Schlage cylinders.
 2. Furnish CL77R for use with FSIC Schlage cylinders.
 3. Furnish CL721G for use with SFIC Schlage cylinders.

2.04 FINISHES

- A. Generally to be satin chrome US26D (626 on bronze and 652 on steel) unless otherwise noted.
- B. Furnish push plates, pull plates and kick or armor plates in satin stainless steel US32D (630) unless otherwise noted.
- C. Door closers shall be powder-coated to match other hardware, unless otherwise noted.
- D. Aluminum items to be finished anodized aluminum except thresholds which can be furnished as standard mill finish.

2.05 FASTENERS

- A. Screws for strikes, face plates and similar items shall be flat head, countersunk type, provide machine screws for metal and standard wood screws for wood.
- B. Screws for butt hinges shall be flathead, countersunk, full-thread type.
- C. Fastening of closer bases or closer shoes to doors shall be by means of sex bolts and spray painted to match closer finish.
- D. Provide expansion anchors for attaching hardware items to concrete or masonry.
- E. All exposed fasteners shall have a phillips head.

- F. Finish of exposed screws to match surface finish of hardware or other adjacent work.
- G. All Exit Devices and Lock Protectors shall be fastened to the door by the means of sex bolts or through bolts.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Verify that doors and frames are square and plumb and ready to receive work and dimensions are as instructed by the manufacturer.
- B. Beginning of installation means acceptance of existing conditions.
- C. Fire-Rated Door Assembly Inspection: Upon completion of the installation, all fire door assemblies shall be inspected to confirm proper operation of the closing device and latching device and that only the manufacturer's furnished fasteners are used for installation and that it meets all criteria of a fire door assembly per NFPA 80 (Standard for Fire Doors and Other Opening Protectives) 2016 Edition. A written record shall be maintained and transmitted to the Owner to be made available to the Authority Having Jurisdiction (AHJ). The inspection of the swinging fire doors shall be performed by a certified FDAI (Fire Door Assembly Inspector) with knowledge and understanding of the operating components of the type of door being subjected to the inspection. The record shall list each fire door assembly throughout the project and include each door number, an itemized list of hardware set components at each door opening, and each door location in the facility.

3.02 INSTALLATION

- A. Install hardware in accordance with manufacturer's instructions and requirements of DHI.
- B. Use the templates provided by hardware item manufacturer.
- C. Mounting heights for hardware shall be as recommended by the Door and Hardware Institute. Operating hardware will to be located between 34" and 44" AFF.
- D. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- E. Drill and countersink units that are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- F. Set thresholds for exterior doors in full bed of butyl-rubber sealant.
- G. If hand of door is changed during construction, make necessary changes in hardware at no additional cost.
- H. Hardware Installer shall coordinate with security contractor to route cable to connect electrified locks, panic hardware and fire exit hardware to power transfers or electric hinges at the time these items are installed so as to avoid disassembly and reinstallation of hardware.

- I. Hardware Installer shall also be present with the security contractor when the power is turned on for the testing of the electronic hardware applications. Installer shall make adjustments to solenoids, latches, vertical rods and closers to insure proper and secure operation.
- J. All wiring for electro-mechanical hardware mounted on the door shall be connected through the power transfer and terminated in the interface junction box specified for in the Electrical Section.
 - . Conductors shall be minimum 18 gage stranded, multicolored. A minimum 12 in. loop of conductors shall be coiled in the interface junction box. Each conductor shall be permanently marked with its function.
- L. If a power supply is specified in the hardware sets, all conductors shall be terminated in the power supply. Make all connections required for proper operation between the power supply and the electro-mechanical hardware. Provide the proper size conductors as specified in the manufacturer's technical documentation.

3.03 ADJUST AND CLEAN

- A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.
- B. Clean adjacent surface soiled by hardware installation.
- C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy, return to that work area and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- D. Instruct Owner's Personnel in proper adjustment and maintenance of hardware finishes, during the final adjustment of hardware.
- E. Continued Maintenance Service: Approximately six months after the completion of the project, the Contractor accompanied by the Architectural Hardware Consultant, shall return to the project and re-adjust every item of hardware to restore proper functions of doors and hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Replace hardware items which have deteriorated or failed due to faulty design, materials or installation of hardware units. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

3.04 HARDWARE LOCATIONS

- A. Conform to CCR, Title 24, Part 2 and ADAAG and the drawings for access-compliant positioning requirements for the disabled.

3.05 FIELD QUALITY CONTROL

- A. Contractor is responsible for providing the services of an Architectural Hardware Consultant (AHC) or a proprietary product technician to inspect installation and certify that hardware and

its installation have been furnished and installed in accordance with manufacturers' instructions and as specified herein.

3.06 SCHEDULE

- A. The items listed in the following schedule shall conform to the requirements of the foregoing specifications.
- B. While the hardware schedule is intended to cover all doors, and other movable parts of the building, and establish type and standard of quality, the contractor is responsible for examining the Plans and Specifications and furnishing proper hardware for all openings whether listed or not. If there are any omissions in hardware groups in regard to regular doors they shall be called to the attention of the Architect prior to bid opening for instruction otherwise, list will be considered Complete. No extras will be allowed for omissions.
- C. The Door Schedule on the Drawings indicates which hardware set is used with each door.

Manufacturers Abbreviations (Mfr.)

ADA	Adams Rite Mfg.	Aluminum Door Hardware
GLY	Glynn-Johnson Corporation	Overhead Door Stops
IVE	Ives	Hinges, Pivots, Bolts, Coordinators, Dust Proof Strikes, Push Pull & Kick Plates, Door Stops & Silencers
JOH	L.E. Johnson	Sliding Door Hardware
LCN	LCN	Door Closers
SCE	Schlage Electronics	Electronic Door Components
SCH	Schlage Lock Company	Locks, Latches & Cylinders
TRI	Trimco	Signs
VON	Von Duprin	Exit Devices
ER	ero International	Thresholds, Gasketing & Weather-stripping

HARDWARE GROUP NO. 01

For use on Door #(s):

101 102

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	VANDL STOREROOM LOC	ND96TD RHO	626	SCH
1	EA	PRIMUS CORE	20-740 EV29	626	SCH
1	EA	LOC GUARD	LG12	630	IVE
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	SEAL SET	2525W	WHT	NGP
1	EA	DOOR SWEEP	200NA	CL	NGP
1	EA	THRESHOLD	896S	AL	NGP

HARDWARE GROUP NO. 02

For use on Door #(s):

103 104A 106A 112A 221A

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	VANDL STOREROOM LOC	ND96TD RHO	626	SCH
1	EA	PRIMUS CORE	20-740 EV29	626	SCH
1	EA	LOC GUARD	LG12	630	IVE
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	FLOOR STOP	FS18S	BL	IVE
1	EA	SEAL SET	2525W	WHT	NGP
1	EA	DOOR SWEEP	200NA	CL	NGP
1	EA	THRESHOLD	896S	AL	NGP

HARDWARE GROUP NO. 02A

For use on Door #(s):

106C 119D

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 TW8	630	IVE
1	EA	VANDL EU STOREROOM	ND96TDEU RHO RX 12V/24V DC	626	SCH
1	EA	PRIMUS CORE	20-740 EV29	626	SCH
1	EA	LOC GUARD	LG12	630	IVE
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	FLOOR STOP	FS18S	BL	IVE
1	EA	SEAL SET	2525W	WHT	NGP
1	EA	DOOR SWEEP	200NA	CL	NGP
1	EA	THRESHOLD	896S	AL	NGP
1	EA	DOOR CONTACT	7764	628	SCE
1			CARD READER - WOR OF DIVISION 28		
1			POWER SUPPLY - WOR OF DIVISION 28		

DOOR CONTACTS WIRED TO SECURITY ALARM

HARDWARE GROUP NO. 03

For use on Door #(s):

108A 109A 110A 115A 119A

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
4	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	VANDL OFFICE LOC	ND91TD RHO	626	SCH
1	EA	PRIMUS CORE	20-740 EV29	626	SCH
1	EA	LOC GUARD	LG12	630	IVE
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	FLOOR STOP	FS18S	BL	IVE
1	EA	SEAL SET	2525W	WHT	NGP
1	EA	DOOR SWEEP	200NA	CL	NGP
1	EA	THRESHOLD	896S	AL	NGP

HARDWARE GROUP NO. 04

For use on Door #(s):

118

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 TW8	630	IVE
1	EA	ELEC PANIC HARDWARE	RX-QELX-PA-AX-99-L-NL-06	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	PRIMUS CORE	20-740 EV29	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	FLOOR STOP	FS18S	BL	IVE
1	EA	SEAL SET	2525W	WHT	NGP
1	EA	DOOR SWEEP	200NA	CL	NGP
1	EA	THRESHOLD	896S	AL	NGP
1	EA	DOOR CONTACT	7764	628	SCE
1			CARD READER - WOR OF DIVISION 28		
1			POWER SUPPLY - WOR OF DIVISION 28		

DOOR CONTACTS WIRED TO SECURITY ALARM

HARDWARE GROUP NO. 05

For use on Door #(s):

301 302 303

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PANIC HARDWARE	CDSI-PA-AX-99-L-NL-06-WH	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MORTISE CYLINDER	26-091 ICX XQ11-948	626	SCH
2	EA	PRIMUS CORE	20-740 EV29	626	SCH
1	EA	CLOSER	MAMMOTH-HD		LOX

HARDWARE GROUP NO. 06

For use on Door #(s):

100A

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
2	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 TW8	630	IVE
1	EA	REMOVABLE MULLION	R4954 STAB	689	VON
1	EA	ELEC PANIC HARDWARE	RX-QELX-PA-AX-99-L-DT-06	626	VON
1	EA	ELEC PANIC HARDWARE	RX-QELX-PA-AX-99-L-NL-06	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	MORTISE CYLINDER	26-091 ICX	626	SCH
2	EA	PRIMUS CORE	20-740 EV29	626	SCH
2	EA	FLOOR STOP	FS18S	BL	IVE
1	EA	THRESHOLD	896S	AL	NGP
2	EA	DOOR CONTACT	7764	628	SCE
1		CARD READER - WOR OF			
		DIVISION 28			
1		POWER SUPPLY - WOR OF			
		DIVISION 28			
1		WEATHERSTRIP BY			
		DOOR/FRAME MANUFACTURER			

DOOR CONTACTS WIRED TO SECURITY ALARM

HARDWARE GROUP NO. 07

For use on Door #(s):

117 216 222

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOC	ND80TD RHO	626	SCH
1	EA	PRIMUS CORE	20-740 EV29	626	SCH
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	WALL STOP	WS401/402CVX	626	IVE
1	EA	SEAL SET	2525W	WHT	NGP

HARDWARE GROUP NO. 07A

For use on Door #(s):

104C 105 112D 217

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOC	ND80TD RHO	626	SCH
1	EA	PRIMUS CORE	20-740 EV29	626	SCH
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	IC PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CVX	626	IVE
1	EA	SEAL SET	2525W	WHT	NGP

HARDWARE GROUP NO. 08A

For use on Door #(s):

112C

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOC	ND80TD RHO	626	SCH
1	EA	PRIMUS CORE	20-740 EV29	626	SCH
1	EA	OH STOP	90S	630	GLY
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	IC PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	SEAL SET	2525W	WHT	NGP

HARDWARE GROUP NO. 09

For use on Door #(s):

109C 110C

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOC	ND80TD RHO	626	SCH
1	EA	PRIMUS CORE	20-740 EV29	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	IC PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CVX	626	IVE
1	EA	SEAL SET	2525W	WHT	NGP

HARDWARE GROUP NO. 09A

For use on Door #(s):

114

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 TW8	652	IVE
1	EA	EU STOREROOM LOC	ND80TDEU RHO RX 12V/24V DC	626	SCH
1	EA	PRIMUS CORE	20-740 EV29	626	SCH
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	IC PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CVX	626	IVE
1	EA	SEAL SET	2525W	WHT	NGP
1	EA	DOOR CONTACT	7764	628	SCE
1		CARD READER - WOR OF			
		DIVISION 28			
1		POWER SUPPLY - WOR OF			
		DIVISION 28			

HARDWARE GROUP NO. 09B

For use on Door #(s):

207

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 TW8	652	IVE
1	EA	EU STOREROOM LOC	ND80TDEU RHO RX 12V/24V DC	626	SCH
1	EA	PRIMUS CORE	20-740 EV29	626	SCH
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	WALL STOP	WS401/402CVX	626	IVE
1	EA	SEAL SET	2525W	WHT	NGP
1	EA	DOOR CONTACT	7764	628	SCE
1			CARD READER - WOR OF DIVISION 28		
1			POWER SUPPLY - WOR OF DIVISION 28		

DOOR CONTACTS WIRED TO SECURITY ALARM

HARDWARE GROUP NO. 10

For use on Door #(s):

113 120

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	CORRIDOR LOC	ND73TD RHO	626	SCH
1	EA	PRIMUS CORE	20-740 EV29	626	SCH
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	IC PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CVX	626	IVE
1	EA	SEAL SET	2525W	WHT	NGP

HARDWARE GROUP NO. 11

For use on Door #(s):

201	202	204	205	206	210
211	214	215	220		

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	VANDL OFFICE LOC	ND91TD RHO	626	SCH
1	EA	PRIMUS CORE	20-740 EV29	626	SCH
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	WALL STOP	WS401/402CVX	626	IVE
1	EA	SEAL SET	2525W	WHT	NGP

HARDWARE GROUP NO. 11A

For use on Door #(s):

108C	115C	121
------	------	-----

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	VANDL OFFICE LOC	ND91TD RHO	626	SCH
1	EA	PRIMUS CORE	20-740 EV29	626	SCH
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	IC PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CVX	626	IVE
1	EA	SEAL SET	2525W	WHT	NGP

HARDWARE GROUP NO. 12

For use on Door #(s):

100B

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	VANDL OFFICE LOC	ND91TD RHO	626	SCH
1	EA	PRIMUS CORE	20-740 EV29	626	SCH
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	IC PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	SEAL SET	2525W	WHT	NGP

HGA
PROJECT # 4952-002

06/05/2024
DSA SPC_V2

BUILDING 3000
MAINTENANCE OPERATIONS
WAREHOUSE & GARAGE
DSA 01-121159

HARDWARE GROUP NO. 13

For use on Door #(s):

119C

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	DBL CYL STORE LOC	ND66TD RHO	626	SCH
2	EA	PRIMUS CORE	20-740 EV29	626	SCH
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	IC PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	SEAL SET	2525W	WHT	NGP

HARDWARE GROUP NO. 14

For use on Door #(s):

208 212

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	CLASSROOM LOC	ND70TD RHO	626	SCH
1	EA	PRIMUS CORE	20-740 EV29	626	SCH
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	IC PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CVX	626	IVE
1	EA	SEAL SET	2525W	WHT	NGP

HARDWARE GROUP NO. 15

For use on Door #(s):

221B

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	SET	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	DUST PROOF STRI E	DP2	626	IVE
1	EA	STOREROOM LOC	ND80TD RHO	626	SCH
1	EA	PRIMUS CORE	20-740 EV29	626	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	SURFACE CLOSER	1461	689	LCN
2	EA	IC PLATE	8400 10" X 2" LDW B-CS	630	IVE
2	EA	WALL STOP	WS401/402CVX	626	IVE
1	EA	SEAL SET	2525W	WHT	NGP
1	EA	MEETING STILE	44STST	STST	ER

HARDWARE GROUP NO. 16

For use on Door #(s):

111

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
5	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	ELECTRIC HINGE	5BB1HW 4.5 X 4.5 TW8	652	IVE
1	SET	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	DUST PROOF STRI E	DP2	626	IVE
1	EA	EU STOREROOM LOC	ND80TDEU RHO RX 12V/24V DC	626	SCH
1	EA	PRIMUS CORE	20-740 EV29	626	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	MOUNTING BRAC ET	MB	689	IVE
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	WALL STOP	WS401/402CVX	626	IVE
1	EA	SEAL SET	2525W	WHT	NGP
1	EA	ASTRAGAL	43STST	STST	ER
2	EA	DOOR CONTACT	7764	628	SCE

DOOR CONTACTS WIRED TO SECURITY ALARM

HARDWARE GROUP NO. 16A

For use on Door #(s):

108.1

Provide each door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	SET	AUTO FLUSH BOLT	FB31P	630	IVE
1	EA	DUST PROOF STRI E	DP2	626	IVE
1	EA	CLASSROOM LOC	ND70TD RHO	626	SCH
1	EA	PRIMUS CORE	20-740 EV29	626	SCH
1	EA	COORDINATOR	COR X FL	628	IVE
2	EA	MOUNTING BRAC ET	MB	689	IVE
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	WALL STOP	WS401/402CVX	626	IVE
1	EA	SEAL SET	2525W	WHT	NGP
1	EA	ASTRAGAL	43STST	STST	ER

HARDWARE GROUP NO. 17

For use on Door #(s):

104B 104D 106B 108B 109B 110B
112B 115B 119B 119E

Provide each door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1		HARDWARE BY ROLL UP DOOR MANUFACTURER		

HARDWARE GROUP NO. 18

For use on Door #(s):

300 304 305

Provide each door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1		HARDWARE BY GATE MANUFACTURER	626	

END OF SECTION

SECTION 08 80 00

GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes Contractor-Engineered glazing for products and applications as specified in this Section, including those specified in other Sections where glazing requirements are specified by reference to this Section.
- B. Related Sections:
 - 1. Section 079200 "Joint Sealants".
 - 2. Section 081113 "Hollow Metal Doors and Frames".
 - 3. Section 084413 "Structural-Sealant-Glazed Aluminum Curtain Walls".

1.3 DEFINITIONS

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.
- C. Interspace: Space between lites of an insulating-glass unit.

1.4 PREINSTALLATION MEETING

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 2. Review temporary protection requirements for glazing during and after installation.

1.5 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

- B. Contractor-Engineered Design: Design glass, including comprehensive engineering analysis according to ASTM E 1300 by a qualified professional engineer, using the following design criteria:
1. Design Wind Pressures: As required by California Building Code and Local Authorities Having Jurisdiction.
 2. Vertical Glazing: For glass surfaces sloped 15 degrees or less from vertical, design glass to resist design wind pressure based on glass type factors for short-duration load.
 3. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch, whichever is less.
 4. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.
 5. Provide tempered or laminated glazing where required to meet safety glazing requirements of Local Authorities Having Jurisdiction (AHJ).
 6. Thickness of glass, where indicated, is minimum thickness. Contractor is responsible for engineering glass and providing thicker glass, where required by calculations.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

1.6 PRECONSTRUCTION TESTING

- A. Preconstruction Adhesion and Compatibility Testing: Test each glazing material type, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.
1. Testing will not be required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.
 2. Use ASTM C 1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
 3. Test no fewer than eight Samples of each type of material, including joint substrates, shims, sealant backings, secondary seals, and miscellaneous materials.
 4. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 5. For materials failing tests, submit sealant manufacturer's written instructions for corrective measures including the use of specially formulated primers.

1.7 ACTION SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches square.
- C. Glazing Accessory Samples: For gaskets, sealants, and colored spacers, in 12-inch lengths. Install sealant Samples between two strips of material representative in color of the adjoining framing system.
- D. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations as indicated on Drawings.

- E. Contractor-Engineered Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation. Professional Engineer shall be licensed in the State of California.

1.8 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For installers and manufacturers of insulating-glass units with sputter-coated, low-e coatings.
- B. Product Certificates: For glass and glazing products, from manufacturer.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for coated glass and insulating glass.
 - 1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.
- D. Preconstruction adhesion and compatibility test report.
- E. Warranties: Sample of special warranties.

1.9 QUALITY ASSURANCE

- A. Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved and certified by coated-glass manufacturer.
- B. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.
- C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- D. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
- E. Source Limitations for Glass: Obtain coated float glass, and insulating glass from single source from single manufacturer for each glass type.
- F. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.
- G. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. GANA Publications: GANA's "Glazing Manual."
 - 2. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR-A7, "Sloped Glazing Guidelines."
 - 3. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

- H. Safety Glazing Labeling: Where safety glazing labeling is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- I. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating-glass manufacturer's written recommendations for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.11 PROJECT CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
 - 1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or below 40 deg F.

1.12 WARRANTY

- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form in which coated-glass manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.
 - 1. Warranty Period: 10 years from date of Substantial Completion.
- B. Manufacturer's Special Warranty on Insulating Glass: Manufacturer's standard form in which insulating-glass manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 – PRODUCTS

2.1 PRIMARY GLASS MANUFACTURERS

- A. AGC Flat Glass North America Ltd.
- B. LOF Inc.
- C. Guardian Glass.
- D. PPG Industries (basis of design.)
- E. American St Gobain.
- F. Or equal.

2.2 FABRICATORS

- A. Viracon.
- B. Craftsman Fabricated Glass.
- C. JE Berkowitz.
- D. Arch Aluminum & Glass.

2.3 CRITERIA AND PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Glass design: Glass thicknesses shown, and heat treatment specified are minimum requirements based upon manufacturer's regularly published literature. The Architect makes no representations as to the accuracy of the literature or the conclusions derived therefrom. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for various size openings in nominal thicknesses indicated, but not less than thickness and in strengths (annealed or heat-treated) required to meet or exceed the criteria specified below and ASTM E 1300.
- C. Delegated design: Glass thickness and temper indicated have not been engineered. Design glass, including comprehensive engineering analysis according to the CBC by a qualified professional engineer under the Contractor's employ, using the following design criteria.
 - 1. Design wind pressures:
 - a. Positive: As indicated on Drawings, but not less than 20 psf.
 - b. Negative: 20 psf, unless otherwise indicated.
 - 2. Vertical glazing: For glass surfaces sloped 15 degrees or less from vertical, design glass to resist design wind pressure based on glass type factors for short-duration load.
 - 3. Maximum lateral deflection: For glass supported on all 4 edges, limit center-of-glass

deflection at design wind pressure to not more than 1/50 times the short-side length or one-inch, whichever is less.

4. Differential shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

D. Thermal movements: Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.

1. Temperature change: 120 deg F, ambient; 180 deg F, material surfaces.
2. Thermal and optical performance properties: Provide glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:
 - a. For monolithic glass lites, properties are based on units with lites 6 mm thick. For laminated glass lites, properties are based on products of construction indicated.
 - b. For insulating glass units, properties are based on units with lites 6 mm thick and a nominal 1/2-inch wide interspace.
 - c. Center of glass U values: NFRC 100 methodology using LBL-35298 WINDOW 4.1 computer program, expressed as Btu/ sq.-foot by hour by -degree F.
 - d. Center of glass solar heat gain coefficient: NFRC 200 methodology using LBL- 35298 WINDOW 4.1 computer program.
 - e. Solar optical properties: NFRC 300.

E. Insulated Glass Units:

1. VLT: 64%.
2. U-Value:
 - a. 0.28 winter night time.
 - b. 0.26 summer daytime.
3. SHGC Coefficient: 0.32
4. See Window Schedule for units requiring tempered replacement.

2.4 GLASS MATERIALS

A. General:

1. Float glass: Shall comply with ASTM C 1036; heat-treated glass shall comply with ASTM A 1048.
2. ASTM C 1172 Standard Specification for Laminated Architectural Flat Glass.
3. ASTM E 2190 Standard Specification for Insulating Glass Unit Performance and Evaluation.
4. ANSI Z97.1 American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications Method of Test.
5. US Consumer Product Safety Commission CPSC 16 CFR 1201 Safety Standard for Architectural Glazing Materials
6. Provide glass free from bubbles, smoke vanes, air holes, scratches and other defects.
7. Laminated glass shall comply with ASTM C 1172. Glass in the lamination shall be from the same manufacturer when heat-strengthened.
8. Fabricate tempered glass by horizontal (roller hearth) process with roll wave distortion parallel to bottom edge of glass as installed, unless otherwise indicated.
9. Comply with Code and the Drawings for glass in hazardous locations. Laminated glass subject to human impact shall comply with CPSC 16 CFR Part 1201.
10. Unless otherwise indicated or specified, overall thickness of each glass type and composite thickness of multiple layer glass types shall be consistent throughout the Project.

11. 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.

B. Glass types: Schedule by Architect

2.5 GLAZING MATERIALS

A. Laminating glass interlayer:

1. Clear, with a proven record not to bubble, discolor, or lose physical and mechanical properties after laminating glass lites and during service life. For glass-to-glass, use 0.03- inch thick, clear, Polyvinyl butyral; "Saflex" by Monsanto Co. or "Butacite" by El du Pont de Nemours & Co., Inc.
 - a. Heat deflection temperature at 0.46 MPa: 110 degrees F., ASTM D 648.

B. Setting block: Neoprene or, in the case of structural silicone glazing, dense extruded silicone; both with a hardness of 80 to 90 durometer Shore A with a minimum length of 4-inch or as required by GANA guidelines.

C. Side blocks: Neoprene or dense silicone with a hardness of 65 to 75 durometer Shore A.

D. Spacer: Neoprene, silicone, or EPDM, 50 to 60 durometer hardness, compatible with sealants used.

E. Sealants:

1. For primary seal of insulating units: Manufacturer standard sealant.
2. For all other conditions: Medium and low modulus (weatherseal) silicone sealant, one- part, non-acidic, neutral curing, Type S, Grade NS, Class 25, Use NT, capable of withstanding movements from plus 50 to minus 50 for medium modulus and plus 100 to minus 50 percent for low modulus based on original joint design.
 - a. Color: Match Architect's paint color for sealant.
 - b. Acceptable products:
 - 1) Dow Corning "795" and "790."
 - 2) General Electric "Silpruf," "Silpruf LM."
 - c. Only low modulus sealant, such as Dow "790" or GE "Silpruf LM," shall be used when sealing to cementitious substrate.

F. Glazing gasket: Resilient, continuous neoprene, (except as specified below) 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, with molded corners.

1. Gaskets shall have a continuous mechanical engagement to framing members and factory molded corners.
2. Gasket corners, whether molded or not, shall be bedded in elastomeric sealant compatible with glazing gaskets.
3. When in direct contact with silicone sealants, gaskets, spacers and setting blocks shall be heat cured silicone rubber-based material chemically compatible with the silicone sealant and with sufficient hardness for the specific purpose intended. Compatibility testing by the silicone sealant supplier/manufacturer shall be required.
4. Design interior and exterior gasket profiles to produce a glass edge pressure of 12 psf

unless otherwise recommended by the glass manufacturer.

- G. Compressible filler rod:
 - 1. Closed-cell 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 percent deflection.
 - 2. Do not use vinyl foam stock.
- H. Laminated glass edge sealer: Ardis 500.
- I. Glass coating for sandblasted surfaces: CLO Ritec "ClearShield Coating" by CLO Glass Ltd.
- J. Cleaner, primer and sealer: Type recommended by sealant or gasket manufacturer.

2.6 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.
 - 3. Glaze openings, which do not fall within tolerances for which precut glass has been sized only with glass specially cut to fit such openings.
 - 4. Do not nip glass edges. Edges may be wheel cut or sawed and seamed at manufacturer's option.
- B. Edge quality of annealed and heat-strengthened glass:
 - 1. Shark teeth shall not penetrate more than half of glass thickness.
 - 2. Serration hackle shall not penetrate more than 10 percent of glass thickness.
 - 3. Flare shall not exceed 0.062-inch as measured perpendicular to glass surface edge.
 - 4. Bevel shall not exceed 0.062-inch.
 - 5. Flake chip depth shall not exceed 0.031-inch and length, or diameter shall not exceed 0.25-inch.
 - 6. Rough chips are not permitted. Rough chips are those that exceed dimensional limits for flake chips.
 - 7. For glass to be cut at site, provide glass 2-inch larger than required, in both dimensions, to facilitate cutting of clean-cut edges without seaming or nipping.
 - 8. Do not cut, seam, nip, or abrade tempered and heat strengthened glass after tempering.
 - 9. Provide flat ground edges with raised corners where glass edge is not covered by a metal stop.
- C. Laminated glass:
 - 1. Factory-laminate using manufacturer standard heat-plus-pressure process.
 - 2. Exercise caution to exclude dirt and other foreign materials from lamination and to eliminate all voids.

3. Arrange each layer of laminate in the order indicated, and label exterior (or interior) face of each completed unit so that there will be no error in the placement during installation.
 4. Conceal processed and coated glass in the lamination.
 5. Factory-cut units to proper size; do no cutting at Project site.
- D. Insulating glass:
1. Provide black aluminum spacers with bent (not mitered or spliced) corners; only one seam is allowed in each spacer of each unit.
 2. The date of the manufacture of the unit shall be discretely identified on the spacer (top of unit, left or right corner).
- E. Etched glass: Acid-etch or sandblast uniformly to match approved Samples, then neutralize acid (when acid-etched) and remove foreign matter, clean and seal with specified sealer applied in accordance with its manufacturer's instructions.
- F. Fire knock-out lites, where required, shall be identified with logos, decals, stickers, etchings, fired on frit or other means as required by Code. Glass at knock-out lite locations shall be fully tempered.
- G. Identification: Identify tempered glass with a manufacturer-installed, removable paper designation as required by CBC section 2406.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 2. Presence and functioning of weep systems.
 3. Minimum required face and edge clearances.
 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that will leave visible marks in the completed work.

3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Adjust glazing channel dimensions as required by Project conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.
- C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for glass lites where length plus width is larger than 50 inches.
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 - 2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- J. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
- K. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- L. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant.
- G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 CLEANING AND PROTECTION

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.
- E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

END OF SECTION

SECTION 09 21 00
GYPSUM BOARD ASSEMBLIES

PART 1 - EXECUTION

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Interior gypsum board.
- 2. Acoustical drywall ceiling.
- 3. Texture finishes.

B. Related Requirements:

- 1. Section 06 16 00 "Sheathing" for gypsum sheathing for exterior walls.
- 2. Section 09 22 16 "Non-Structural Metal Framing" for non-structural steel framing and suspension systems that support gypsum board panels.
- 3. Section 09 30 00 "Tiling" for backer units installed as substrates for ceramic tile.

1.3 PRE-INSTALLATION MEETING

- A. Prior to start of each type of gypsum board system, and at the Contractor's direction, meet at the site and review the installation procedures and coordination with other Work. Meeting shall include Contractor, Architect and major material manufacturer, as well as the Installer and other subcontractors whose Work must be coordinated with the gypsum board Work.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product including gypsum board and accessories.

1.5 QUALITY ASSURANCE

- A. Single-Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.

- B. Single-Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging. Handle gypsum board to prevent damage to edges, ends, and surfaces. Do not bend or otherwise damage metal corner beads and trim.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.
- D. Installation of gypsum board joint treatments shall not start until the space to receive gypsum board joint treatments is heated to maintain a continuous and uniform temperature of not less than 55 deg F (8 deg C), from one week prior to beginning of joint treatment until joint treatment is completed and thoroughly dry. Ventilation, either natural or supplied by fans, circulators or air conditioning systems shall be provided to remove excess moisture during joint treatment. Temperature requirements may be waived only on recommendation of gypsum board manufacturer.

PART 2 - EXECUTION

2.1 GYPSUM BOARD ASSEMBLIES

- A. Provide completed assemblies complying with ASTM C 840 and GA-216.
- B. Interior Partitions Indicated as Sound-Rated: Provide completed assemblies with the following characteristics:
 - 1. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E 413, based on tests conducted in accordance with ASTM E 90.

- C. Fire Rated Assemblies: Provide completed assemblies with the following characteristics:
1. Gypsum Association File Numbers: Comply with requirements of GA-600 for the particular assembly.

2.2 METAL FRAMING MATERIALS

- A. Non-Loadbearing Framing System Components: ASTM C 645; galvanized sheet steel, of size and properties necessary to comply with ASTM C 754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.
1. Exception: The minimum metal thickness and section properties requirements of ASTM C 645 are waived provided steel of 40 ksi minimum yield strength is used, the metal is continuously dimpled, the effective thickness is at least twice the base metal thickness, and maximum stud heights are determined by testing in accordance with ASTM E 72 using assemblies specified by ASTM C 754.
 2. Studs: "C" shaped with flat or formed webs with knurled faces.
 3. Runners: U shaped, sized to match studs.
 4. Furring: Hat-shaped sections, minimum depth of 7/8 inch.
- B. Shaft Wall Studs and Accessories: ASTM C 645; galvanized sheet steel, of size and properties necessary to comply with ASTM C 754 and specified performance requirements.

2.3 GYPSUM BOARD MATERIALS

- A. Gypsum Wallboard: ASTM C 1396/C 1396M. Sizes to minimize joints in place; ends square cut.
1. Regular Type:
 - a. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
 - b. Thickness: 5/8 inch.
 - c. Edges: Tapered.
 2. Fire Resistant Type: Complying with Type X requirements; UL or WH rated.
 - a. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X.
 - b. Edges: Tapered.
 3. Abuse Resistant Gypsum Board: Where indicated on drawings in high traffic areas, corridors, etc.

Per ASTM C1629 meet the following:
 - a. Surface Abrasion: Level 3
 - b. Surface Indentation: Level 3
 - c. Soft-Body Impact: Level 3
 - d. Hard-Body Impact: Level 3
- B. Water-Resistant Gypsum Backing Board: ASTM C 1396/C 1396M; ends square cut.
1. Application: Vertical surfaces behind thinset tile, except in wet areas.
 2. Core Type: Regular and Type X, as indicated.
 3. Thickness: 5/8 inch.
 4. Edges: Tapered.

2.4 FIBERGLASS REINFORCED BOARD MATERIALS

- A. Glass Mat Gypsum Board: Gypsum panels with moisture-resistant core and coated inorganic fiberglass mat back surface designed to resist growth of mold and mildew, per ASTM D 3273.
1. Paper-Faced Board: Comply with performance requirements of ASTM C 1396/C 1396M for gypsum wallboard and ASTM C 1177/C 1177M for sheathing; tapered long

edges.

- a. Product: DensArmour Plus Paperless Interior Panel manufactured by Georgia Pacific.
- b. Standard Type: Thickness 5/8 inch.
- c. Mold Resistance (ASTM D 3273); 10, in a test as manufactured.

2.5 ACCESSORIES

A. Acoustic Insulation:

1. Batt Insulation: ASTM C 518; preformed batt; friction fit, conforming to the following:
 - a. Material: Recycled cotton.
 - b. Flame Spread Index: 5 (class I/A), when tested in accordance with ASTM E 84.
 - c. Smoke Developed Index: 35 (class I/A), when tested in accordance with ASTM E 84.
 - d. Formaldehyde Content: Zero.
 - e. Combustibility:
 - f. Manufacturer: Ultratouch Natural Cotton Fiber Insulation by Bonded Logic, www.bondedlogic.com.
 - g. Substitutions: See Section 01 60 00 - Product Requirements.

B. Acoustic Sealant: As specified in Section 07 92 00.

C. Sheet caulking for junction boxes: "Lowery's Electrical Box Sealer" (800-772-2521), or Tremco sheet caulking (800-321-7906). Sheet caulking for junction boxes at fire-rated assemblies: "Firestop Putty Pads" by Hevi-duty/Nelson (800-331-7325), Specified Technologies, Inc. (800-992-1180), or HILTI CP-617 (800-879-8000).

D. Joint Materials: ASTM C 475 and as recommended by gypsum board manufacturer for project conditions.

1. Tape: 2-inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
2. Ready-mixed vinyl-based joint compound.

F. Screws: ASTM C 1002; self-piercing tapping type; cadmium-plated for exterior locations.

G. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

H. Expanding Foam Sealant: Class 1 fire retardant polycell expanding foam by Macklanburg Duncan (800-348-3571).

I. Cementitious sealant: Spray-applied (40 pcf) Monokote Z-146.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and support framing, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION AND FINISHING OF PANELS, GENERAL

- A. Install in accordance with Reference Standards ASTM C840 & GA-216 and to the following:
1. Gypsum board surfaces shall have no measurable variation in any 2-foot direction and a maximum variation of 1/8 inch in 10 feet when a straightedge is laid on the surface in any direction. Specified tolerances apply to both plumbness of walls and levelness of ceilings.
 2. Shim work as required to comply with specified tolerances.
 3. Do not exceed 1/16-inch offset between planes of abutting sheets at edges or ends.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
 2. Fit gypsum panels around ducts, pipes, and conduits.
 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- I. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C919 and with manufacturer's written instructions for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

- J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 INSTALLATION OF INTERIOR GYPSUM BOARD

A. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels vertically (parallel to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
3. On Z-shaped furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

B. Multilayer Application:

1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
3. On Z-shaped furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
4. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

- C. **Laminating to Substrate:** Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.

3.4 INSTALLATION OF TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Interior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners unless otherwise indicated.
 - 2. LC-Bead: Use at exposed panel edges.
 - 3. L-Bead: Use where indicated.
 - 4. U-Bead: Use at exposed panel edges.
 - 5. Curved-Edge Cornerbead: Use at curved openings.
- C. Aluminum Trim: Install in locations indicated on Drawings.

3.5 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Glass-Mat, Water-Resistant Backing Panels: Do not use paper tape and joint compound. Finish according to manufacturer's written instructions.
- E. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:
 - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 - 2. Level 2: Panels that are substrate for tile.
 - 3. Level 3: Where indicated on Drawings.
 - 4. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
 - a. Primer and its application to surfaces are specified in Section 09 91 00 "Painting and Coating."
 - 5. Level 5: Where indicated on Drawings.
 - a. Primer and its application to surfaces are specified in Section 09 91 00 "Painting and Coating."
- F. Glass-Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.
- G. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.

3.6 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

SECTION 09 22 16

NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Non-load-bearing steel framing systems for interior partitions.
2. Suspension systems for interior ceilings and soffits.
3. Grid suspension systems for gypsum board ceilings.

B. Related Requirements:

1. Section 05 40 00 "Cold-Formed Metal Framing" for exterior and interior load-bearing and exterior non-load-bearing wall studs; floor joists; and roof rafters and ceiling joists.
2. Section 09 51 23 "Acoustical Ceiling Systems" for grid suspension systems for gypsum board ceilings.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of code-compliance certification for studs and tracks.
- B. Evaluation Reports: For [**embossed, high-strength steel studs and tracks**] [**firestop tracks**] [**post-installed anchors**] [**and**] [**power-actuated fasteners**], from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.5 QUALITY ASSURANCE

- A. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Steel Framing Industry Association.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated on Drawings, according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.
- C. Load and Deflection Criteria: Design and construct non-structural metal framing walls to withstand a lateral loading of minimum 5 psf positive and negative pressure, except where more stringent requirements are indicated.

2.2 FRAMING SYSTEMS

- A. Metal Studs:
 - 1. General:
 - a. For 18 gage and lighter units, fabricate metal framing components of commercial quality steel sheet with a minimum yield point of 33,000 psi; ASTM A653, A570, or A611.
 - b. For 16-gage and heavier units, fabricate metal framing components of structural quality steel sheet with a minimum yield point of 40,000 psi; ASTM A653, A570, or A611.
 - c. Provide galvanized finish to metal framing components complying with ASTM A924 for minimum G 40 at all locations.
 - 2. Typical Metal Studs: See drawings for typical stud sizes and gauges per floor.
- B. Deflection Track: As shown on reviewed Shop Drawings and in conformance with the specified standards and performance requirements.
- C. Headers: As shown on reviewed Shop Drawings and in conformance with the specified standards and performance requirements.
- D. Channels: As shown on reviewed Shop Drawings and in conformance with the specified standards and performance requirements.
 - 1. Typical for Miscellaneous Framing, Furring, and Carrying Channels: Cold-rolled steel coated with rust-inhibitive material, with following minimum weights per 1000 lineal feet, subject to standard mill weight tolerances.

Size Inches	Gauge	Pounds
0-3/4	16, minimum base steel thickness 0.0568"	300
1-1/2	16, minimum base steel thickness 0.0568"	475
2	16, minimum base	

steel thickness 0.0568"

2. Furring (Hat) Channels, Screw-on Type: Formed from 20-gauge galvanized steel, minimum base steel thickness 0.0329 inch, with knurl surfaced face to receive screws.
- E. Flexible Track: Flex-Ability Concepts "Flex-C Trac", or equal. ASTM A653, 16- gauge, structural Grade 50. Hot dipped galvanized steel, G-60 coating.
- F. Adjustable Wall Furring Bracket: 20 gage galvanized steel with serrated edges, 16, minimum base steel thickness 0.0329 inch.
- G. Backing for wall-mounted items specified elsewhere: As shown on Drawings.
- H. Fasteners: Grabber, as manufactured by John Wagner Associates, Inc., or equal, to suit stud, track, or channel gage.
 1. Sheet metal screws to be overlaid with gypsum wallboard or other finish material:
 - a. No. 8 by 9/16-inch Wafer Head Streaker, or equal, for fastening 20-gage material.
 - b. No. 10 by 1/2-inch wafer Head Self-Drilling, or equal, for fastening 18-gage and above material. Length and gage as required to engage a minimum of 3 treads and as indicated.
 2. Sheet Metal Screws Not Overlaid with Finish Material:
 - a. No. 8 by 9/16-inch Hex Head Streaker, or equal, for fastening 20-gage material.
 - b. Hex Head Self-Drilling, or equal, for fastening 18-gage and above material; No. 10 by 1/2-inch minimum. Length and gage as required to engage a minimum of 3 threads and as indicated.
 3. Powder-Actuated Devices (PAD): Size and embedments as shown on drawings; Hilti DNI-32-P8 (ICBO #ER2388), Impex Tool Company, or equal.
 4. Wire: 16-gage annealed galvanized steel tie wire.

2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide one of the following:
 1. Asphalt-Saturated Organic Felt: ASTM D226/D226M, Type I (No. 15 asphalt felt), nonperforated.
 2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.
 - 1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.
- B. Coordination with Sprayed Fire-Resistive Materials:
 - 1. Before sprayed fire-resistive materials are applied, attach offset anchor plates or ceiling tracks to surfaces indicated to receive sprayed fire-resistive materials. Where offset anchor plates are required, provide continuous plates fastened to building structure not more than 24 inches o.c.
 - 2. After sprayed fire-resistive materials are applied, remove them only to extent necessary for installation of non-load-bearing steel framing. Do not reduce thickness of fire-resistive materials below that are required for fire-resistance ratings indicated. Protect adjacent fire-resistive materials from damage.

3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C754.
 - 1. Gypsum Board Assemblies: Also comply with requirements in ASTM C840 that apply to framing installation.
- B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.
- C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.
- D. Install bracing at terminations in assemblies.
- E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING FRAMED ASSEMBLIES

- A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
 - 1. Single-Layer Application: As required by horizontal deflection performance requirements unless otherwise indicated.
 - 2. Multilayer Application: As required by horizontal deflection performance requirements unless otherwise indicated.

3. Tile Backing Panels: As required by horizontal deflection performance requirements unless otherwise indicated.
- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- C. Install studs so flanges within framing system point in same direction.
- D. Install tracks at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.
 1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb unless otherwise indicated.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
 - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
 3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
 4. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
 - a. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.
 5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
 6. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.5 INSTALLING CEILING SUSPENSION SYSTEMS

- A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
- C. Suspend hangers from building structure as follows:
 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.

- a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
 - a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.
 3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
 4. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.
 5. Do not attach hangers to steel roof deck.
 6. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
 7. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
 8. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- D. Fire-Resistance-Rated Assemblies: Wire tie furring channels to supports.
- E. Seismic Bracing: Sway-brace suspension systems with hangers used for support.
- F. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.
- G. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION

SECTION 09 24 23
PORTLAND CEMENT PLASTER

PART 1 – GENERAL

2.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

2.2 SUMMARY

- A. Section Includes:
 - 1. Exterior plasterwork.
- B. Related Sections:
 - 1. Section 072500 "Weather Barriers."

2.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

2.4 ACTION SUBMITTALS

- A. Product Data: For specified items, submit information on the component materials, information on the recommendations for application and use, test data substantiating that products comply with requirements.
- B. Shop Drawings: Submit installation details for waterproofing system and show project-specific details at reinforcing, at terminations, at expansion joints in structure, at intersection of horizontal and vertical surfaces, and at penetrations in membrane systems.
 - 1. Submit for typical and non-typical conditions of Project. Manufacturer's standard data sheets and details are not acceptable for Shop Drawings. Details must be project-specific and are not allowed to be photocopies of the architectural drawings.
 - 2. Indicate and identify materials to be incorporated in the work, dimensions, thickness of each material and system, and relationships to adjacent construction, including out of scope work.
- C. Submit Samples: For specified materials that will become part of the mock-up assembly in addition to the following samples:
 - 1. For each type of finish coat indicated, provide a sample panel of cement plaster (stucco), constructed on 2 ft high x 3 ft long plywood panels with water-resistive barrier membrane, rigid insulation, slip sheet, stucco trims, metal lath and fasteners, spread out each layer offset horizontally to reveal each material in sequence.

2.5 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution. Mockup shall be in place from control joint to control joint for Architect approval.
 - 1. Build mockups for each substrate and finish texture indicated for cement plastering, including accessories.
 - a. Size: 4 x 4 feet in surface area.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

2.6 WARRANTY

- A. Manufacturer shall provide single source warranty to the Owner for 15 years, warranting against defective materials, basecoats, lamina, primer and acrylic finish.
- B. Installer shall provide a single source warranty to the Owner for 15 years, warranting against defective installation of all materials, including basecoats, lamina, primer and acrylic finish.

2.7 DELIVERY, STORAGE, AND HANDLING

- A. Store materials inside under cover, and keep them dry and protected against damage from weather, moisture, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.

2.8 FIELD CONDITIONS

- A. Comply with ASTM C926 requirements.
- B. Exterior Plasterwork:
 - 1. Apply and cure plaster to prevent plaster drying out during curing period. Use procedures required by climatic conditions, including moist curing, providing coverings, and providing barriers to deflect sunlight and wind.
 - 2. Apply plaster when ambient temperature is greater than 40 deg F.
 - 3. Protect plaster coats from freezing for not less than 48 hours after set of plaster coat has occurred.
- C. Factory-Prepared Finishes: Comply with manufacturer's written recommendations for environmental conditions for applying finishes.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Plastering materials:
 - 1. Portland cement: ASTM C 150, Type I or II. Use only one brand throughout this work.
 - 2. Hydrated lime: ASTM C 206, Type S.
 - 3. Sand: ASTM C 897 or ASTM C 144, graded as follows, except for finish coat.

Percentage retained on each sieve		
Sieve Size	Max.	Min.
No. 4	0	0
No. 8	10	0
No. 16	40	10
No. 30	65	30
No. 50	90	70
No. 100	100	90
No. 200	100	97

- 4. Fiber reinforcement: 1/2 in. long chopped glass fiber strands Type AR by Owens-Corning Corp., Dur-O-Fibar by Dur-O-Wall, Inc., or Cem-Fil by Pilkington, or 1/2 in. chopped polypropylene fibers by Fibermesh Co. or Fiber Con, Inc.
- 5. Water: Potable, fresh from domestic source.
- 6. Pre-mixed, integrally colored finish coat: By La Habra Products, Inc., Highland Stucco, Omega Stucco, Thoro System Products, or equal of the custom color selected by the Architect.
- 7. Paper weather barrier: Complying with UBC 94 Standard y14-1 and FS UU-B-790, Type I, Grade D (vapor permeable), Style 2, except with a water resistance of 60 minutes; Fortifiber Corp. "Super Jumbo Tex" or equal.
- 8. Lath: Expanded diamond mesh lath weighing 3.4 lbs./ sq. yd. made from uncoated or zinc-coated (galvanized) steel sheet to produce lath complying with ASTM C 847, with uncoated steel sheet painted after fabrication, by Western Metal Lath, Amico West or Cemco.

B. Metal trim members:

1. Minimum 26-gage hot-dip galvanized steel, supplied in longest obtainable single lengths to minimize joints, by Clark Western, Stockton Products, Amico, Cemco, Keene/Metalex Corp., Superior, Unimast Inc., or Niles Building Products, unless otherwise specified or indicated.
2. Control joints expansion flange: Clark Western No. XJ15-3.
3. Strip reinforcement: Galvanized 4-inch wide StripEX.
4. Casing bead expansion flange: Clark Western No. 66.
5. Corner reinforcement: Stockton Products Co. Corneraid, or Clark Western "Stucco-Lok".
6. Soffit screed: Stockton Products "NFD."
7. Base screed: Clark Western "No. 36", Stockton Products "Stucco Stop" or "W-S" where indicated.
8. Soffit vent screed: Stockton Products "F Vent Mold," Stockton "Type PCS."
9. Door and window flashing: Stockton Products WTP.

C. Screws: "Fastenseal" self-sealing screws conforming to ASTM F 1667, with a 0.125-inch diameter shank, a 7/16-inch diameter head, length to satisfy Code but not less than required to penetrate stud a minimum of 3 full threads, with an HDPE spacer containing butyl rubber, by Fasten Seal (www.fastenseal.com) – no known equal.

D. Tie-wire: Galvanized, annealed steel wire 16-gage for lath-to-supports and 18-gauge for accessories-to-lath.

2.2 PLASTER MIXES

A. Scratch coat (by volume): One part Portland cement, maximum one-part dry hydrated lime, maximum 4 parts loose sand aggregate of the total volume of cement/lime, and 1 lb. of glass fibers or 0.7 lb. of polypropylene fibers.

B. Brown coat (by volume): Same as specified for scratch coat except that sand may be increased to 4-1/2 parts of the total volume of cement/lime.

C. Finish coat: As specified above.

D. Mixing: Mix ingredients in a plaster mixer as accurately as possible to obtain a homogenous mass. Add to the mixer from calibrated containers. Do not use materials which are caked, lumpy, dirty or contaminated by foreign materials.

1. If calibrated container supply interferes with progress of Work, shovels may be used provided they are measured to determine the accuracy of the volume of aggregate they carry, in accordance with manufacturer's printed instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify site conditions and dimensions by field measurement in consideration of the special conditions associated with repairs to existing construction prior to development of

submittals and to material fabrication or delivery. Notify the Engineer immediately of any inconsistency between the conditions found and those shown in the Drawings.

3.2 PREPARATION

- A. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.
- B. Prepare smooth, solid substrates for plaster according to ASTM C926.

3.3 INSTALLING DRAINAGE COMPOSITE

- A. Drainage Composite Installation: Install in accordance with manufacturer's instructions, including:
 - 1. Place drainage mat horizontally against exterior wall, fabric side out, entangled core to the building interior. Starting at the bottom of the wall, position the first piece of drainage mat where the bottom edge of the stone will meet the ledger board.
 - 2. Hold in place with small dabs of glue every 2 feet. Do not fasten through flashing.
 - 3. Seam adjacent piece with the selvage edge overlapping the top of the lower drainage mat piece.
 - 4. Install expanded metal lath over the drainage mat according to the manufacturer's recommendations.
 - 5. Apply stucco according to manufacturer's recommendations. Provide a weep method for ventilation and drainage.
 - 6. Trim drainage mat around all penetrations, windows and doors so that the material is flush to the flashing.

3.4 INSTALLING ACCESSORIES

- A. Install according to ASTM C1063 and at locations indicated on Drawings.
- B. Reinforcement for External (Outside) Corners:
 - 1. Install cornerbead at exterior locations.
- C. Control Joints: Locate as approved by Architect for visual effect and as follows:
 - 1. As required to delineate plasterwork into areas (panels) of the following maximum sizes:
 - a. Vertical Surfaces: 144 sq. ft.
 - b. Horizontal and Other Nonvertical Surfaces: 100 sq. ft.
 - 2. At distances between control joints of not greater than 18 feet 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.

3.5 PLASTER APPLICATION

- A. General: Comply with ASTM C 926.
- B. Apply premixed plaster in accordance with manufacturer's ICC ESR Report #2535.
- C. Crack-Reduction/Lamina Coat:
 - 1. Ensure that the surface of the wall is cured for 7 days, clean, dry and free of efflorescence, oil or other contaminants that would impair adhesion.
 - 2. Apply modified basecoat mixture in continuous layer approximately 3/32 inch thick.
 - 3. Apply a layer of reinforcing mesh into the wet mixture and trowel smooth until mesh is fully embedded. Lap adjoining pieces of mesh 2-1/2 inches minimum and as described in the manufacturer's written instructions and technical bulletins.
 - 4. Let dry for a minimum of 24 hours, until dry, or longer as required by weather conditions.
- D. Standard Curing: Basecoat requires adequate moisture to allow continuous hydration of the cement.
 - 1. Minimum two (2) days of moist curing shall be provided.
 - 2. Provide additional moist curing to conform to code requirements, manufacturer recommendations, local practices and climatic conditions and as otherwise required to provide acceptable substrate for finish coat.
 - 3. Base coat shall be allowed to cure for a minimum of 7 days prior to coating with acrylic primer and Finish.

- E. Primer Application:
 - 1. Ensure that the surface of the wall is cured, clean, dry and free of efflorescence, oil or other contaminants that would impair adhesion.
 - 2. Primer color shall closely match that of the selected finish.
 - 3. Stir to a smooth homogeneous consistency and apply to the wall using a roller, brush or airless spray equipment. Refer to published Colored Primer data sheet for more complete instructions.
 - 4. Allow to completely dry, usually 24 hours.

- F. Finish Application:
 - 1. Ensure that the surface of the wall is clean, dry, and free from contaminants that may impair the adhesion of surface finish.
 - 2. Spray, or trowel-apply textured finish to dried primer.
 - 3. Apply finish to natural breaks to avoid visible cold joints.
 - 4. Always work the shady side of the wall or provide temporary shading to avoid application in direct sunlight.
 - 5. Apply in accordance with manufacturer directions for the specific finish and texture being used.

3.6 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.

3.7 CLEANING AND PROTECTION

- A. Remove temporary protection and enclosure of other work after plastering is complete. Promptly remove plaster from door frames, windows, and other surfaces not indicated to be plastered. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

END OF SECTION

SECTION 09 30 00
TILING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Glazed ceramic tile.
 - 2. Porcelain tile.
 - 3. Waterproof membrane for thinset applications.
 - 4. Crack isolation membrane.
 - 5. Metal edge strips.
- B. Related Requirements:
 - 1. Section 07 92 00 "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.
 - 2. Section 09 29 00 "Gypsum Board" for cementitious backer units and glass-mat, water-resistant backer board.

1.3 PREINSTALLATION MEETINGS

- A. Prior to the installation of tile, and at the Contractor's direction, meet at the Project site to review the material selections, substrate preparations, installation procedures, coordination with other trades, special details and conditions, standard of workmanship, and other pertinent topics related to the Work.
 - 1. The meeting shall include the Owner, Architect, the Contractor, tile installer, tile and setting material manufacturer's representatives, and representatives of other trades or subcontractors affected by the installation.
 - 2. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- C. Samples for Initial Selection: For each type of tile and grout indicated. Include Samples of accessories involving color selection.
- D. Samples for Verification:
 - 1. Full-size units of each type and composition of tile and for each color and finish required.
 - 2. Assembled samples mounted on a rigid panel, with grouted joints, for each type and composition of tile and for each color and finish required. Make samples at least 12 inches square, but not fewer than four tiles. Use grout of type and in color or colors approved for completed Work.
 - 3. Full-size units of each type of trim and accessory for each color and finish required.
 - 4. Stone thresholds in 6-inch lengths.
 - 5. Metal edge strips in 6-inch lengths.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer. Provide certification in writing from manufacturer.
- B. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.
- C. Product Certificates: For each type of product, signed by product manufacturer. Submit manufacturer's certifications for each type of tile, grout, and bonding material being provided suitable for the intended use and meet or exceed the referenced standards and the requirements of this Specification.
- D. Product Test Reports: For tile-setting and -grouting products and certified porcelain tile.
- E. Material Test Reports: For each tile-setting and -grouting product and special purpose tile. Submit test reports from qualified independent testing laboratory indicating and interpreting test results relative to compliance of tile products with requirements specified for slip resistance.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Instructions: Submit maintenance instructions for each type of product specified.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.
2. Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

1.8 QUALITY ASSURANCE

- A. Installer: Engage an installer, with a minimum of five years of successful commercial tile installations similar in material, design, and scope to that indicated.
- B. Installer Qualifications:
 1. Installer is [**a Five-Star member of the National Tile Contractors Association**] [or] [**a Trowel of Excellence member of the Tile Contractors' Association of America**].
 2. Installer's supervisor for Project holds the International Masonry Institute's Foreman Certification.
 3. Installer employs only [**Ceramic Tile Education Foundation Certified Installers**] [or] [**installers recognized by the U.S. Department of Labor as Journeyman Tile Layers**] for Project.
 4. Installer employs at least one installer for Project that has completed the Advanced Certification for Tile Installers (ACT) certification for installation of [**membranes**] [**shower receptors**] [**gauged porcelain tile/gauged porcelain tile panels and slabs**] [and] [**large format tile**].
- C. Source Limitations for Tile: Obtain tile of each type and color or finish from one source or producer.
 1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- D. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from one manufacturer and each aggregate from one source or producer.
- E. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer for each product:
 1. Waterproof membrane.
 2. Metal edge strips.
- F. Field-Constructed Sample Installations: Before installing tile, erect sample installations for each form of construction and finish required to verify selections made under sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution. Build sample installations to comply with the following requirements, using materials indicated for final unit of Work.
 1. Locate sample installations on site, in locations and size indicated or, if not shown or indicated, as directed by Architect but not less than 100 sq. ft. area for walls.
 2. Retain and maintain sample installations during construction in undisturbed condition as a standard for judging completed unit of Work, unless otherwise indicated below.
 3. Approved sample installations may become part of the completed Work if undisturbed at time of Substantial Completion.

- G. First In-Place Mock-Up:
1. Provide the following mock-ups for tile at restrooms:
 - a. General tile –wall run with corners and specialty tile/frame.
 2. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 3. Build mockup of each type of wall tile installation.
 4. Prior to general installation of any given typical portion or system of the Work, erect on the building a representative first in-place mock-up for the Architect's and Owner's approval.
 5. Propose the scope and location of first in-place mock-up for the Architect's approval.
 6. Notify the Architect and the Owner well in advance of each such first in-place mock-up. If approved, this portion of the work shall become part of the final installation.
 7. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- H. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Build mockup of each type of floor tile installation.
 2. Build mockup of each type of wall tile installation.
 3. Build mockup area minimum 10 by 10 feet for all major or feature finishes.
 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.
- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.
- D. Store liquid materials in unopened containers and protected from freezing.
- E. Prevent damage or contamination to materials by water, freezing, foreign matter, and other causes.
- F. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

- B. Provide minimum 28-day cure of concrete before the installation of the tile work.
- C. Maintain temperatures within range recommended by the mortar and grout manufacturer, but not less than 50 deg F or more than 90 deg F, in spaces during tile setting. After installation maintain temperatures within range recommended by the mortar and grout manufacturer
- D. Close spaces to traffic during tile flooring installation.
- E. Close spaces to traffic for 72 hours after tile flooring installation.
- F. Shade all tile, materials, and the work area from direct sunlight during the installation as needed to prevent rapid evaporation caused by excessive heat or wind.

1.11 WARRANTY

- A. Minimum 2-Year warranties shall be provided for all installed material and equipment unless more stringent requirements are noted in this section. Standard Manufacturer Warranties shall be provided where they exceed minimum warranty requirements.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Dynamic Coefficient of Friction (DCOF): For tile installed on walkway surfaces, provide products with the following value as determined by testing identical products by the DCOF AcuTest Method per ANSI 137.1, 2012 Edition.
 - 1. Dynamic Coefficient of Friction shall be not less than the following:
 - a. Level Surface: Minimum 0.42.
 - b. Sloped and Wet Surfaces: Minimum 0.45.

2.2 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide Standard grade tile that complies with ANSI A137.1 "Specifications for Ceramic Tile," and ANSI A137.2, "Specifications for Glass Tile," for types, compositions, and other characteristics indicated.
 - 1. Products and Manufacturers: Provide tile matching the Architect's samples which have been selected from the product lines and manufacturers indicated in Finish Schedule on Drawings.
 - 2. Provide tile complying with Standard grade requirements unless otherwise indicated.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.
- C. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

- D. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.
 - 1. Where tile is indicated for installation in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.
- E. Tile Trim Units: Matching characteristics of adjoining flat tile and coordinated with sizes and coursing where applicable.
- F. Rectified Tile Edges: Provide all tile units having a face dimension of greater than 8" x 8" with factory rectified edges.
- G. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with continuous film of petroleum paraffin wax, applied hot. Do not coat unexposed tile surfaces.

2.3 MANUFACTURERS

- A. Source Limitations for Tile: Obtain tile of each type and color or finish from single source or producer.
 - 1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from single manufacturer and each aggregate from single source or producer.
 - 1. Obtain setting and grouting materials, except for unmodified Portland cement and aggregate, from single manufacturer.
 - 2. Obtain waterproof membrane, except for sheet products, from manufacturer of setting and grouting materials.
- C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer:
 - 1. Stone thresholds.
 - 2. Waterproof membrane.
 - 3. Metal edge strips.

2.4 TILE

- A. Manufacturers: All products by the same manufacturer.
 - 1. Dal-Tile Corporation: www.daltile.com.
 - 2. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Glazed Ceramic Tile: ANSI A137.1 and as follows:
 - 1. Basis-of-Design: Core Fundamentals – Advantage.
 - 2. Size and Shape: 12 by 24 inches.
 - 3. Edges: Square.
 - 4. Color: Light Beige AR31.

- C. Porcelain Tile: ANSI A137.1 and as follows:
 - 1. Product: Glazed porcelain wall tile.
 - 2. Basis-of-Design: Colorbody Industrial Park.
 - 3. Size and Shape: 12 by 12 inches .
 - 4. Edges: Square.
 - 5. Color: Charcoal Gray.

2.4 TRIM AND ACCESSORIES

- A. Thresholds: Marble, white Carrara, honed finish or as shown on Drawings; 2 inches wide by full width of wall or frame opening; 1/2-inch-thick; beveled, two long edges, with radiused corners on top side; without holes, cracks, or open seams.
 - 1. Applications: Provide at the following locations:
 - a. At doorways where tile terminates.
- B. Metal Edge/Transition Strips: As shown on Drawings of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.
 - 1. Basis-of-Design: Schluter or equal.
 - a. Size: As required to trim exposed edges of the specified tile and setting material thickness.
 - b. Material: Stainless Steel.
 - c. Color: Refer to Finish Schedule on Drawings.
 - d. Locations: As shown on the Drawings.
 - 2. Products:
 - a. Edge trim at GWB: "JOLLY".
 - b. Trim at tiled corners: "FINEC/-SQ".

2.5 ADHESIVE MATERIALS

- A. Adhesives: Meet LEED Credit EQ 4.1.
- B. Adhesive Material for TZ-1: Wausau Tile Thinset Mortar-exceeds ANSI A 118.4 or as recommended by tile manufacturer.
- C. Organic Adhesive at TCNA W245: ANSI A118.1, thinset bond type.

2.6 MORTAR MATERIALS

- A. Manufacturers:
 - 1. Mapei Corporation; Product Keraset: www.mapei.com.
 - a. When used with porcelain tile, mix with Keraply.
 - 2. Laticrete; meet ANSI A118.1 and ANSI A118.4: www.laticrete.com.
 - 3. Bostik, Inc; meet ANSI A118.1 and ANSI A118.4: www.bostik-us.com.
 - 4. Substitutions: See Section 01600 - Product Requirements.
- B. Mortar Bond Coat Materials:
 - 1. TCNA F 112 Installation: Dry-Set Portland Cement type: ANSI A118.1.
 - 2. TCNA F 113 Installation: Latex-Portland Cement type: ANSI A118.4.

2.7 GROUT MATERIALS

- A. Grout: Any type specified in ANSI A118.6 or A118.7.
 - 1. Color: As selected from manufacturer's standard colors.

2.8 ACCESSORY MATERIALS

- A. Bond Coat: As recommended by mortar manufacturer.
- B. Crack Isolation Membrane at TCNA EJ171 for TZ-1: Mapei "Mapeguard SM" or approved equal.
- C. Crack Isolation Membrane at TCNA F112 for Ceramic Floor Tile: Compositite Corp. "Composeal Gold" or approved equal.
- D. Tile Sealer for TZ-1: Johnson "Plaza Plus" or approved equal.
- E. Grout Release: As recommended by TZ-1 manufacturer.
- F. Grout Sealer: As recommended by tile manufacturers.
- G. Coated Glass Mat Backer Board: ASTM C 1178/C 1178M, with coated inorganic fiberglass mat on both surfaces and integral acrylic coating vapor retarder.
 - 1. Product: DensShield Tile backer manufactured by Georgia Pacific.
 - 2. Standard Type: Thickness 5/8 inch.
- H. Mesh Tape: 2-inch-wide self-adhesive fiberglass mesh tape.

PART 3 - EXECUTION

3.1 INSTALLATION OF CERAMIC TILE

- A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.

3.2 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 - 1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
 - 2. Verify that substrates for setting tile are sound and free of voids, bugholes, rock pockets, honeycombs, and protrusions, and which are dry, clean, free of oil, waxy films, and curing compounds. Grind or scarify concrete substrates to remove existing floor adhesive and mortar residues (if any), laitance, films, sealing and curing compounds if they are determined to be present on the substrate.
 - 3. Verify that concrete substrates for tile floors installed with thinset mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.

- a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
 - b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
4. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
 5. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
 6. Do not commence installation of materials until substrate is within the following tolerances in all directions. If substrate is not within tolerance, level the substrate using a method and a product(s) that is compatible with and acceptable to the setting materials manufacturer.
 7. Subfloor Surfaces to Receive Thinset and Medium Set Setting Beds: +/- 1/8 inch in 10 feet non-cumulative.
 8. Subfloor Surfaces to Receive Thickset Setting Beds: +/- 1/4 inch in 10 feet non-cumulative.
 9. No valleys or ridges greater than 1/8 inch.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

- A. Remove paint, coatings, including curing compounds and other substances that are incompatible with tile-setting materials.
- B. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thinset mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.
- C. Where indicated, prepare substrates to receive waterproof membrane by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains.
- D. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.
 1. Furnish the same lots, batches, etc. within the same contiguous areas of the site (i.e. corridors on the same floors, common rooms which adjoin each other, etc.).
- E. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.4 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

3.5 INSTALLATION OF TILE BACKING PANEL

- A. Install panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated. Use modified dry-set mortar for bonding material unless otherwise directed in manufacturer's written instructions.

3.6 INSTALLATION OF WATERPROOFING MEMBRANE

- A. Install waterproof membrane to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness that is bonded securely to substrate.
- B. Allow waterproof membrane to cure and verify by testing that it is watertight before installing tile or setting materials over it.

3.7 INSTALLATION OF CERAMIC TILE, GENERAL

- A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
 - 1. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:
 - a. Tile floors in wet areas.
 - b. Tile floors consisting of tiles 8 by 8 inches or larger.
 - c. Tile floors consisting of rib-backed tiles.
- B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.

- E. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
 2. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
 3. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.
- F. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
1. Large Format Tile: [**1/16 inch**] [**1/8 inch**] as selected by Architect.
 2. Porcelain Tile: [**1/4 inch**] [**3/8 inch**] as selected by Architect.
- G. Lay out **tile wainscots** to dimensions indicated or to next full tile beyond dimensions indicated.
- H. Finished Surfaces: Unless otherwise accepted in the sample installation(s), if any, finished surfaces shall present a flat, even appearance, free from waver, projections, and
- I. Refer to TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" and to the ANSI A108 series of tile installation standards for data on expansion joints. These standards require that joint locations be indicated on Drawings.
- J. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.
- K. Movement (Contraction, Control, Expansion, and Isolation Joints) Joints: Locate sealant filled movement joints where recommended by the manufacturer of mortar and grout materials, but not less than the requirements of TCNA EJ171 which follows, and as accepted by the Architect. Form movement joints and other sealant-filled joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles. Where movement joints are to be butted, the ends shall touch and align.
- L. Spacing Guidelines:
1. 20 to 25 feet in each direction where interior tile work is not exposed to direct sunlight or moisture.
 2. 8 to 12 feet in each direction where interior tile work is exposed to direct sunlight and moisture.
 3. Where tilework abuts restraining surfaces such as perimeter walls, dissimilar floors, curbs, columns, pipes, ceilings, and where changes occur in backing materials, but not at drain strainers.
 4. In the joint between tiles making up the inside corner of planes.

5. All contraction, control, expansion, isolation, seismic and cold joints in the horizontal structure and vertical surfaces shall continue through the tile surfaces, but not through membranes.
 6. Vertical and Horizontal Joints Widths: Widths for quarry tile and paver tile shall be the same as the grout joint but not less than 1/4 inch or the width of the contraction, control, expansion, seismic, isolation joint whichever is greater; widths for ceramic mosaic tile and glazed wall tile shall not be less than 1/8 inch or the width of the control, expansion, seismic, joint whichever is greater.
 7. Keep movement joints free from dirt, debris, grout, mortar, and setting bed materials. Prepare joints and apply sealants to comply with requirements in Section 07 92 00 "Joint Sealants".
- M. Metal Edge Strips: Install where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of tile and no threshold is indicated.
- N. Metal Edge Strips: Install where exposed edge of wall tile meets other wall finishes that finish flush with or below face of tile and the manufacturer of the field tile does not manufacture a tile edge transition trim. Where metal edge strips are indicated and full length single units are not available, joints are to be butted, ends shall touch and align.
- O. Grout Sealer: Apply grout sealer to cementitious grout joints according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.
- P. Floor Sealer: Apply floor sealer to cementitious grout joints in tile floors according to floor-sealer manufacturer's written instructions. As soon as floor sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

3.8 INSTALLATION OF FLOOR TILE

- A. Thinset Tile over Concrete Slabs (Where noted): Install in accordance with the mortar manufacturer's recommendations and requirements indicated below for setting bed methods, installation methods related to types of subfloor construction, and grout installation methods and grout types. Where recommendations and methods conflict, the manufacturer's recommendations shall apply.
- B. Concrete Subfloors, Interior: TCNA F113.
1. With a trowel, having notches sized as recommended by the mortar manufacturer, comb the surface of the mortar with the notched side of the trowel removing excess mortar. Spread only as much mortar as can be covered in the time limits established by the mortar manufacturer's recommendations.
 2. Wipe the back of each tile, with a damp sponge, to remove all dust or dirt immediately before applying mortar to tiles.
 3. Immediately after wiping tile backs, but prior to placing tile, the mortar shall be troweled to back of tile for 100 percent coverage to thickness of not less than 1/16-inch.
 4. Place tiles onto mortar bed, maintaining 1/8-inch-wide joints, and true accurate pattern as shown. Exercise care to quickly remove spillage from faces of tile using damp sponge. Rake out joints to depth required to receive grout as tile units are set.

5. Prohibit foot and wheel traffic on tiled floors for period of time as recommended by the mortar manufacturer.
 6. Grout Installation: Do not begin grouting tiles until they are firmly set and, in no case, in less than 48 hours after they have been installed. Remove spacers, if any, prior to grouting. For typical installations, comply with latex-portland cement: ANSI A108.10. Fill joints of cushion edged tile to the depth of the cushion; fill joints of square edge tile flush with the tile surface. Do not permit mortar, mounting mesh, or spacer material to show through grouted joints. Provide hard finished grout, which is uniform in color, smooth, and without voids, pinholes, or low spots. Tool surfaces with shallow concave profile.
- C. Thickset Tile (Toilet Rooms): Install in accordance with the mortar manufacturer's recommendations and requirements indicated below for setting bed methods, installation methods related to types of subfloor construction, and grout installation methods and grout types. Where recommendations and methods conflict, the manufacturer's recommendations shall apply. Thickness of mortar bed: Between 1-1/4-inch and 2-inches.
- D. Concrete Subfloors, Interior: TCNA F125-Full.
1. Apply the mortar to crack isolation membrane covered slab with the flat side of the trowel.
 2. With a trowel, having notches sized as recommended by the mortar manufacturer, comb the surface of the mortar with the notched side of the trowel removing excess mortar. Spread only as much mortar as can be covered in the time limits established by the mortar manufacturer's recommendations.
 3. Wipe the back of each tile, with a damp sponge, to remove all dust or dirt immediately before applying mortar to tiles.
 4. Immediately after wiping tile backs, but prior to placing tile, the mortar shall be troweled to back of tile for 100 percent coverage to thickness of not less than 1/16-inch.
 5. Place tiles onto mortar bed, maintaining 1/8-inch wide joints, and true accurate pattern as shown. Exercise care to quickly remove spillage from faces of tile using damp sponges. Rake out joints to depth required to receive grout as tile units are set.
 6. Prohibit foot and wheel traffic on tiled floors for period of time as recommended by the mortar manufacturer.
 7. Grout Installation: Do not begin grouting tiles until they are firmly set and, in no case, in less than 48 hours after they have been installed. Remove spacers, if any, prior to grouting. Comply with Latex-portland cement: ANSI A108.10. Fill joints of cushion edged tile to the depth of the cushion; fill joints of square edge tile flush with the tile surface. Do not permit mortar, mounting mesh, or spacer material to show through grouted joints. Provide hard finished grout, which is uniform in color, smooth, and without voids, pinholes, or low spots. Tool surfaces with shallow concave profile.
- E. LHT Set Tile (Only where indicated): Install in accordance with the mortar manufacturer's recommendations and requirements indicated below for setting bed methods, installation methods related to types of subfloor construction, and grout installation methods and grout types. Where recommendations and methods conflict, the manufacturer's recommendations shall apply.

- F. Concrete Subfloors, Interior: TCNA F205 (on-ground slabs) and TCNA F205A (above ground slabs) except apply LHT bed in thickness of 3/4" unless otherwise indicated.
1. Where required by the conditions indicated, apply underlayment using methods and within time limits recommended by the mortar manufacturer.
 2. With a trowel, having notches sized as recommended by the mortar manufacturer, place and comb the surface of the mortar with the notched side of the trowel removing excess mortar. Spread only as much mortar as can be covered in the time limits established by the mortar manufacturers recommendations.
 3. Wipe the back of each tile, with a damp sponge, to remove all dust or dirt immediately before applying mortar to tiles.
 4. Immediately after wiping tile backs, but prior to placing tile, the mortar shall be troweled to back of tile for 100% coverage to thickness of not less than 1/16-inch.
 5. Place tiles onto mortar bed, maintaining 1/8-inch wide joints, and true accurate pattern as shown. Exercise care to quickly remove spillage from faces of tile using damp sponges. Rake out joints to depth required to receive grout as tile units are set.
 6. Prohibit foot and wheel traffic on tiled floors for period of time as recommended by the mortar manufacturer.
 7. Grout Installation: Do not begin grouting tiles until they are firmly set and, in no case, in less than 48 hours after they have been installed. Remove spacers, if any, prior to grouting. Comply with Latex-portland cement: ANSI A108.10. Fill joints of cushion edged tile to the depth of the cushion; fill joints of square edge tile flush with the tile surface. Do not permit mortar, mounting mesh, or spacer material to show through grouted joints. Provide hard finished grout, which is uniform in color, smooth, and without voids, pinholes, or low spots. Tool surfaces with shallow concave profile.
- G. Mortar and Bond Coat:
1. Latex-Portland Cement Mortar: ANSI A108.1A (Wet Set Method).
 2. Latex-Portland Cement Bond Coat: ANSI A108.5.
 3. Concrete Subfloors, Interior: TCNA F121.
 4. Apply the mortar to waterproofed slab with the flat side of the trowel.
 5. Apply half of the mortar bed to slab and place reinforcing wire fabric. After placing mesh, apply balance of mortar bed. The mortar shall be rodded and compacted with a steel trowel.
 6. Wipe the back of each tile, with a damp sponge, to remove all dust or dirt immediately before applying bond coat to tiles.
 7. Immediately after wiping tile backs, but prior to placing tile, the mortar shall be troweled to back of tile sheets for 100 percent coverage to thickness of not less than 1/16-inch.
 8. Place tile onto the green mortar bed, maintaining 1/8-inch-wide joints for typical tile units and 1/4-inch-wide joints for quarry tile units if any, and true accurate pattern as shown. Tamp tile with wood block and rubber mallet to produce finish levels of tile matching adjacent tile surfaces. Beating shall take place prior to mortar taking and initial set. Exercise care to quickly remove spillage from faces of tile using water. Rake out joints to depth required to receive grout as tile units are set. Maintain fully plastic bed throughout tile installation.

9. Prohibit foot and wheel traffic on tiled floors for period of time as recommended by the mortar manufacturer.
 10. Grout Installation Do not begin grouting tiles until they are firmly set and, in no case, in less than 48 hours after they have been installed. Remove spacers, if any, prior to grouting. For typical installations, comply with latex Portland cement: ANSI A108.10. Fill joints of cushion edged tile to the depth of the cushion; fill joints of square edge tile flush with the tile surface. Do not permit mortar, mounting mesh, or spacer material to show through grouted joints. Provide hard finished grout, which is uniform in color, smooth, and without voids, pinholes, or low spots. Tool surfaces with shallow concave profile.
- H. Thresholds: Install thresholds in one piece, notched to fit neatly at door jambs; set in same type of setting bed as abutting field tile in accordance Manufacture's recommendations and TCNA Method TR61.

3.9 INSTALLATION OF WALL TILE

- A. Install in accordance with the mortar manufacturer's recommendations and requirements indicated below for ANSI setting bed methods, TCNA installation methods related to types of construction, and grout ANSI installation methods and grout types. Where recommendations and methods conflict, the manufacturer's recommendations shall apply.
- B. Latex Portland Cement Mortar Installation (using specified latex Portland cement mortar material): ANSI A108.5.
- C. Gypsum Wallboard, Interior (Latex Portland Cement Mortar) Method: TCNA W243, place tiles maintaining 1/8-inch-wide joints, and true accurate pattern as shown.
- D. Cementitious Backerboard (Latex Portland Cement Mortar) Method: TCNA W244C, place tiles maintaining 1/8-inch-wide joints, and true accurate pattern as shown.
- E. Grout Installation: Do not begin grouting tiles until they are firmly set and, in no case, in less than 48 hours after they have been installed. Remove spacers, if any, prior to grouting. Comply with Latex-Portland cement: ANSI A108.10. Fill joints of cushion edged tile to the depth of the cushion; fill joints of square edge tile flush with the tile surface. Do not permit mortar, mounting mesh, or spacer material to show through grouted joints. Provide hard finished grout, which is uniform in color, smooth, and without voids, pinholes, or low spots. Tool surfaces with shallow concave profile.

3.10 INSTALLATION TOLERANCES

- A. Variation from Plumb: For vertical joints, external corners, and other conspicuous lines, do not exceed 1/8 inch in 8 ft.
- B. Variation in Level: For horizontal joints and other conspicuous lines, do not exceed 1/8 inch in 10 ft., or 1/2 inch.
- C. Variation in Surface Plane of Flooring: Do not exceed 1/8 inch in 10 ft. from level or slope indicated when tested with a 10-foot straightedge.

D. Variation in Plane between Adjacent Units (Lipping): Do not exceed the following differences between faces of adjacent units as measured from a straightedge parallel to stone tiled surface:

1. Units with Polished Faces: 1/64 inch.

E. Variation in Joint Width: Do not vary joint thickness more than 1/16 inch or one-fourth of nominal joint width, whichever is less.

3.11 ADJUSTING AND CLEANING

A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.

B. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

1. Remove grout residue from tile as soon as possible.
2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
3. Remove temporary protective coating by method recommended by coating manufacturer and that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent drain clogging.
4. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, and otherwise defective tile work. Replace all cracked, chipped, and broken tile units with matching tile units; patched tile units will not be permitted.

3.12 PROTECTION

A. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.

B. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.

C. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

3.13 QUALITY CONTROL

A. Testing: After stone flooring installation, test entirety of installation in accordance with the DCOF AcuTest.

- B. Note to Owner: After each subsequent installation of floor sealer, re-test flooring to meet Performance Requirements specified herein, using the DCOT AcuTest.

END OF SECTION

SECTION 09 51 00
ACOUSTIC TILE CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Acoustical tiles for interior ceilings.
- 2. Fully concealed, direct-hung, suspension systems.
- 3. Extruded aluminum trim for ceiling height changes and material transitions.

B. Related Requirements:

- 1. Section 07 92 00 "Joint Sealants".
- 2. Section 09 22 16 "Non-Structural Metal Framing".

- C. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- B. Qualification Data: For Installer.

- C. Samples: For each exposed product and for each color and texture specified, **6 inches** in size.

- D. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of sizes indicated below:

- 1. Acoustical Tiles: Set of full-size Samples of each type, color, pattern, and texture.
- 2. Concealed Suspension-System Members: 6-inch- long Sample of each type.
- 3. Exposed Moldings and Trim: Set of 6-inch- long Samples of each type and color.

4. Seismic Clips: Full size.

E. Delegated-Design Submittal: For seismic restraints for ceiling systems.

1. Include design calculations for seismic restraints including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Ceiling suspension-system members.
2. Structural members to which suspension systems will be attached.
3. Method of attaching hangers to building structure.
 - a. Furnish layouts for cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
4. Carrying channels or other supplemental support for hanger-wire attachment where conditions do not permit installation of hanger wires at required spacing.
5. Size and location of initial access modules for acoustical tile.
6. Items penetrating finished ceiling and ceiling-mounted items including the following:
 - a. Lighting fixtures.
 - b. Diffusers.
 - c. Grilles.
 - d. Speakers.
 - e. Sprinklers.
 - f. Access panels.
 - g. Perimeter moldings.
7. Show operation of hinged and sliding components adjacent to acoustical tiles.
8. Minimum Drawing Scale: 1/4 inch = 1 foot.

B. Qualification Data: For testing agency.

C. Product Test Reports: For each acoustical tile ceiling, for tests performed by a qualified testing agency.

D. Evaluation Reports: For each acoustical tile ceiling suspension system and anchor and fastener type, from ICC-ES.

E. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Acoustical Ceiling Units: Full-size tiles equal to 2 percent of quantity installed.
 - 2. Suspension-System Components: Quantity of each concealed grid and exposed component equal to 2 percent of quantity installed.

1.8 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Build mockup of typical ceiling area as shown on Drawings.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical tiles, suspension-system components, and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical tiles, permit them to reach room temperature and a stabilized moisture content.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not install acoustical tile ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
 - 1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical tile ceiling installation.

PART 2 - PRODUCTS

2.1 ACOUSTICAL UNITS

- A. Manufacturers:
 - 1. Basis of Design: Armstrong World Industries, Inc: www.armstrong.com.
 - 2. Acceptable manufacturer: USG: www.usg.com.

3. Substitutions: Not permitted.

B. Acoustical Units - General: ASTM E 1264, Class A.

C. Acoustical Panels Type AC-2: Painted mineral fiber, ASTM E 1264 Type III, Form 1, Pattern E1 with the following characteristics:

1. Size: 24 x 24 inches.
2. Thickness: 3/4 inches.
3. Composition: Wet felted.
4. Light Reflectance: 85 percent, determined as specified in ASTM E 1264.
5. Noise Reduction Coefficient (NRC): 0.70
6. Ceiling Attenuation Class (CAC): 35, determined as specified in ASTM E 1264.
7. Edge: Beveled Tegular.
8. Surface Color: White.
9. Flame Spread: 25 or under.
10. Smoke Development Index: Class A in accordance with ASTM E84.
11. Product: Cirrus #589 by Armstrong World Industries.

2.2 SUSPENSION SYSTEM(S)

A. Manufacturers:

1. Basis of Design: Armstrong World Industries, Inc: www.armstrong.com.
2. Acceptable manufacturer: USG: www.usg.com.
3. Substitutions: See Section 01 60 00 - Product Requirements.

B. Suspension Systems - General: ASTM C 635; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.

C. Type SS-1: Not Used.

D. Exposed Steel Suspension System Type SS-2: Formed steel, commercial quality cold rolled; heavy-duty.

1. Profile: Tee; 9/16-inch-wide face.
2. Construction: Double web.
3. Finish: White painted.
4. Product: Suprafine XL #7501 by Armstrong World Industries.

E. Concealed Suspension System Type SS-3: Formed steel, commercial quality cold rolled; heavy-duty.

1. As recommended by ceiling manufacturer.

2.3 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

B. Perimeter Moldings: Same material and finish as grid.

1. At Exposed Grid: Provide L-shaped or W molding for mounting at same elevation as face of grid.
2. At Concealed Grid: Provide concealed molding.

C. Gypsum Board: Fire rated type; 5/8 inch thick, ends and edges square, paper faced.

D. Acoustical Sealant for Perimeter Moldings: Specified in Section 07 90 00.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing and substrates to which acoustical tile ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine acoustical tiles before installation. Reject acoustical tiles that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Testing Substrates: Before adhesively bonding tiles to wet-placed substrates such as cast-in-place concrete or plaster, test and verify that moisture level is below tile manufacturer's recommended limits.
- B. Measure each ceiling area and establish layout of acoustical tiles to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width tiles at borders unless otherwise indicated, and comply with layout shown on reflected ceiling plans.
- C. Layout openings for penetrations centered on the penetrating items.

3.3 INSTALLATION OF SUSPENDED ACOUSTICAL TILE CEILINGS

- A. Install suspended acoustical tile ceilings according to ASTM C636/C636M and manufacturer's written instructions.
 - 1. Fire-Rated Assembly: Install fire-rated ceiling systems according to tested fire-rated design.
- B. Suspend ceiling hangers from building's structural members and as follows and as shown on Drawings:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.

4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly to structure or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
 6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
 7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
 8. Do not attach hangers to steel deck tabs.
 9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 10. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
 11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical tiles.
1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
 2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends. Miter corners accurately and connect securely.
 3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. Install acoustical tiles in coordination with suspension system and exposed moldings and trim. Place splines or suspension-system flanges into kerfed edges of tiles so tile-to-tile joints are interlocked.
1. Fit adjoining tiles to form flush, tight joints. Scribe and cut tiles for accurate fit at borders and around penetrations through ceiling.
 2. Hold tile field in compression by inserting leaf-type, spring-steel spacers between tiles and moldings, spaced 12 inches o.c.
 3. Protect lighting fixtures and air ducts according to requirements indicated for fire-resistance-rated assembly.

3.4 ERECTION TOLERANCES

- A. Suspended Ceilings: Install main and cross runners level to a tolerance of 1/8 inch in 12 feet, non-cumulative.
- B. Moldings and Trim: Install moldings and trim to substrate and level with ceiling suspension system to a tolerance of 1/8 inch in 12 feet, non-cumulative.

3.5 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
 - 1. Periodic inspection during the installation of suspended ceiling grids according to ASCE/SEI 7.
- B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- C. Perform the following tests and inspections of completed installations of acoustical tile ceiling hangers and anchors and fasteners in successive stages and when installation of ceiling suspension systems on each floor has reached 20 percent completion, but no tiles have been installed. Do not proceed with installations of acoustical tile ceiling hangers for the next area until test results for previously completed installations of acoustical tile ceiling hangers show compliance with requirements.
 - 1. Within each test area, testing agency will select one of every 10 power-actuated fasteners and postinstalled anchors used to attach hangers to concrete and will test them for 200 lbf of tension; it will also select one of every two postinstalled anchors used to attach bracing wires to concrete and will test them for 440 lbf of tension.
 - 2. When testing discovers fasteners and anchors that do not comply with requirements, testing agency will test those anchors not previously tested until 20 pass consecutively and then will resume initial testing frequency.
- D. Acoustical tile ceiling hangers, anchors, and fasteners will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports.

3.6 ADJUSTING

- A. Clean exposed surfaces of acoustical tile ceilings, including trim and edge moldings. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.
- B. Remove and replace tiles and other ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

HGA
PROJECT # 4952-002

06/05/2024
DSA SPC_V2

BUILDING 3000
MAINTENANCE OPERATIONS
WAREHOUSE & GARAGE
DSA 01-121159

END OF SECTION

SECTION 096120

CONCRETE FLOOR SEALER

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes: Interior concrete hardening and dustproofing.
- B. Related Requirements:
 - 1. Section 03 30 00 "Cast-in-Place Concrete" for concrete not designated as sealed concrete.
 - 2. Section 03 35 43 "Polished Concrete Floors".

1.3 ACTION SUBMITTALS

- A. Test Diagram: Prepare a moisture report of each test area. Include name of company performing the test; types of testing instruments used; floor plan of building with each test location identified; starting date, time, and beginning weight; estimate of building temperature; stopping date, time, and ending weight; and computed pounds of emission, including equations.
- B. Product Data: For each type of product.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's trained personnel or factory-trained authorized installer. Installer shall have a minimum of 5 years' experience in the installation of concrete vapor emission control systems.
- B. Manufacturer Qualifications: Minimum 5 years' experience producing moisture vapor control emission products.

1.5 FIELD CONDITIONS

- A. Apply water vapor control system treatment materials within a temperature range of 65 degrees F. and 100 degrees F.
- B. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

1.6 WARRANTY

- A. Warranty failure of finish flooring system due to concrete water vapor emission to the installed system for a period of 10 years from date of Substantial Completion. Include replacement of finish flooring material, and re-application of adhesive, vapor emission control system.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Slip Resistance: Dynamic coefficient of friction of installed flooring shall be as follows, when measured in accordance with ANSI 326.3, not less than 0.42 for level surfaces.

2.2 SEALED CONCRETE MATERIALS

- A. Sealed Concrete: Prosoco "Consolideck LS". Clear concrete hardener and dustproofer. System shall reduce dusting and simplify maintenance.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Vapor Emission Testing:
 - 1. Perform pre-installation testing of the concrete slab by a calcium chloride test prior to the application of specified water vapor emission control system treatment. Testing shall be performed by a qualified testing personnel and Testing Laboratory.
 - 2. Perform three tests for the first 1,000-sq. ft. of flooring and one additional test for each additional 1,000-sq. ft. of flooring. Conduct around the perimeters of the room, at columns and where moisture may be evident.
 - 3. Tests shall determine the change in weight of moisture-absorbing anhydrous calcium chloride and the results shall represent the amount of moisture transmitting out of the concrete slab area. The value shall be expressed in pounds and shall be equivalent to the weight of the water that is emitted from a 1,000-sq. ft. concrete slab area in a 24-hour period of time.
 - 4. Do not perform tests until the room where the test is to be performed has been controlled by the HVAC system for a period of 10 days.
- B. If calcium chloride testing reveals water vapor emission levels greater than 3 pound per 1,000-sq. ft. for resilient and elastomeric flooring and 5 pounds per 1,000-sq. ft. for carpet, apply specified remedial sealer in accordance with manufacturer's instructions.

3.2 SURFACE PREPARATION FOR APPLICATION OF REMEDIAL SEALER

- A. Concrete surfaces to be sealed shall be clean and free of residue, debris, and sealing compounds.

- B. Prepare concrete to receive sealer in accordance with manufacturer's instructions.
- C. Clean substrate surfaces to receive system treatment and treat irregularities with a 100 percent Portland cement based patching compound and cementitious fill compatible with specified vapor emission control system.

3.3 APPLICATION OF REMEDIAL VAPOR EMISSION CONTROL SEALER

- A. Apply sealer by squeegee and roller method to saturate the concrete surface. Apply materials in accordance with manufacturer's instructions.
- B. Coverage rates shall be in accordance with manufacturer's recommendations based on concrete density and porosity.
- C. Allow materials to penetrate and cure, and re-test for vapor emission levels.
- D. Unless more restrictive emission levels are required by finish flooring manufacturers, do not apply resilient flooring until the vapor emission has been reduced to 3-lbs./1,000-sq. ft./24-hrs. or less and adhesively-applied carpet, if used, until the vapor emission has been reduced to 5-lbs./1,000-sq. ft./24-hrs. or less.

3.4 CLEANING AND REPAIR

- A. The premises shall be kept clean and free of debris.
- B. Remove spatter from adjoining surfaces.
- C. Repair damages to surface caused by cleaning operations.

3.5 PROTECTION

- A. Protect finished work until fully cured in accordance with manufacturer's recommendations.
- B. Use floor covering/protection immediately following polishing and maintain through substantial project completion.

END OF SECTION

SECTION 09 65 13

RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Thermoset-rubber base.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, not less than 12 inches long.
- C. Samples for Initial Selection: For each type of product indicated.
- D. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 inches long.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.5 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Coordinate mockups in this Section with mockups specified in other Sections.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

3. Retain subparagraph below if the intention is to make an exception to the default requirement in Section 01 40 00 "Quality Requirements" for demolishing and removing mockups.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.7 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following periods:
 1. 48 hours before installation.
 2. During installation.
 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F .
- C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Wall Base:
 1. Basis-of-Design: Refer to Finish Schedule as shown on Drawings.
- B. Transitions: As shown on Drawings.

2.2 THERMOSET-RUBBER BASE

- A. General: PVC-free resilient base materials; meeting the requirements of ASTM F1861, Type TS-Rubber, vulcanized, thermoset or Type TP-Rubber, Thermoplastic.
 1. Height: 4-inches, Typical.
 2. Thickness: 1/8-inch.
 3. Profile:
 - a. At Carpet: Straight.
 - b. Other Locations: Coved.
- B. Adhesive for Resilient Bases: Waterproof type recommended in writing or supplied directly by base manufacturer.

1. Adhesive Trowel: Use appropriate trowel tooth patterns as recommended by the Resilient Base manufacturer in writing for use with the specified products.
 2. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - a. Adhesives: 50 g/L.
- C. Locations: Provide resilient base at locations shown or scheduled on Drawings, including:
1. Exposed Concrete floors.
 2. Floors finished with materials specified in this Section when scheduled to receive rubber base.
 3. Floors finished with materials specified in the following Sections:
 - a. Section 09 68 13 Tile Carpeting.

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.
- C. Metal Edge Strips: Extruded aluminum with mill finish, nominal 2 inches wide, of height required to protect exposed edges of flooring, and in maximum available lengths to minimize running joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

- C. Do not install resilient products until materials are the same temperature as space where they are to be installed.
 - 1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.
- D. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

3.4 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Do not stretch resilient base during installation.
- C. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- D. Preformed Corners: Install preformed corners before installing straight pieces.
- E. Job-Formed Corners:
 - 1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.
 - a. Form without producing discoloration (whitening) at bends.
 - 2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.
 - a. Miter or cope corners to minimize open joints.

3.5 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.

- B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

3.6 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Perform the following operations immediately after completing resilient-product installation:
 - 1. Remove adhesive and other blemishes from surfaces.
 - 2. Sweep and vacuum horizontal surfaces thoroughly.
 - 3. Damp-mop horizontal surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION

SECTION 09 65 19
RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Resilient tile flooring.
 - 2. Static dissipative tile flooring.
- B. Related Requirements:
 - 1. Section 07 26 16 "Concrete Vapor Treatment".
 - 2. Section 09 65 13 "Resilient Base and Accessories".

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of resilient floor tile.
 - 1. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
 - 2. Show details of special patterns.
- C. Samples: Two full-size units of each color, texture, and pattern of floor tile required.
- D. Product Schedule: For floor tile.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Field Test Reports: Provide signed field test reports for tests indicated below. Indicate results and test locations. Include manufacturer's recommendations.
 - 1. Anhydrous calcium chloride test results.
 - 2. Relative humidity probe test results.
 - 3. Alkalinity test results.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Floor Tile: 2% of installed product.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.
 - 1. Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Coordinate mockups in this Section with mockups specified in other Sections.
 - a. Size: Minimum 100 sq. ft. for each type, color, and pattern in locations directed by Architect.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store floor tiles on flat surfaces.

1.9 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive floor tile during the following periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient floor tile, as determined by testing identical products according to ASTM E648 or NFPA 253 by a qualified testing agency.
- B. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm. Static-Dissipative Properties: Provide floor coverings with static-control properties indicated as determined by testing identical products per test method indicated by an independent testing and inspecting agency.
 - 1. Electrical Resistance: Test per ASTM F 150 with 100-V applied voltage.
 - a. Average greater than 1 megohm and less than or equal to 1000 megohms when test specimens are tested surface to ground.
 - b. Average no less than 1 megohm and less than or equal to 1000 megohms when installed floor coverings are tested surface to ground.
 - 2. Static Generation: Less than 100 V when tested per AATCC-134 at 20 percent relative humidity with conductive footwear.
 - 3. Static Decay: 5000 to 0 V in less than 0.25 seconds when tested per FED-STD-101C/4046.1.

2.2 VINYL COMPOSITE FLOOR TILE

- A. [VCT-1] Basis-of-Design: ShawContract, Unite II, "Commingle".
 - 1. Color and Pattern: As shown on Finish Schedule on Drawings.
- B. [VCT-3] Basis-of-Design: Tarkett Event Series Luxury Vinyl, Heritage Plank EHP, "Windsor".
 - 1. Color and Pattern: As shown on Finish Schedule on Drawings.

2.3 STATIC-DISSIPATIVE TILE FLOORING

- A. [VCT-2] Basis-of-Design: Julie Industries, Summit Series, "Rainier".
 - 1. Color and Pattern: As shown on Finish Schedule on Drawings.

2.4 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland-cement-based, or approved by floor tile manufacturer for applications indicated.
- B. Seamless-Installation Accessories:
 - 1. Heat-Welding Bead: Manufacturer's solid-strand product for heat welding seams.
 - a. Colors: As selected by Architect from manufacturer's full range to match flooring.
- C. Static-Control Adhesive: Provided or approved by manufacturer; type that maintains electrical continuity of floor covering system to ground connection.
- D. Grounding Strips: One 2-inch by 24-inch copper strap installed every 2,000 to 2,500 square feet of installed floor finish.

- E. Integral-Flash-Cove Base Accessories:
 - 1. Cove Strip: 1-inch radius support strip provided or approved by manufacturer.
 - 2. Cap Strip: Square metal cap provided or approved by manufacturer.
 - 3. Corners: Metal inside and outside corners and end stops provided or approved by floor covering manufacturer.

- F. Floor Polish: Provide protective, static-dissipative tile floor polish products as recommended by floor covering manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.

- B. Concrete Substrates: Prepare according to ASTM F710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing.
 - 4. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft. and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
 - a. Test substrates to determine acceptable dryness prior to application of flooring. Use Primer Test or Mat Moisture and Bonding Test as applicable for appropriate type flooring as recommended by manufacturer.
 - b. Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate recommended by flooring manufacturer.
 - c. Relative Humidity Test: Using in-situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum relative humidity level recommended by flooring manufacturer.

- C. Flooring Panels: Remove protective film of oil or other coating using method recommended by access flooring manufacturer.

- D. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- E. Do not install floor tiles until materials are the same temperature as space where they are to be installed.
 - 1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.
- F. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
 - 1. Lay tiles as directed by Architect.
- C. Match tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
 - 1. Lay tiles in pattern of colors and sizes indicated on Drawings.
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames. Extend unexposed edges of flooring under set on bases and similar trim work.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- H. Adhere floor tiles to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
- I. Heat weld for seamless, hygienic, watertight installation, where shown on Drawings. Use manufacturer's solid-strand product for heat welding seams.
- J. Arrange for testing after installation static-control adhesives have fully cured and floor covering systems have stabilized to ambient conditions and after ground connections are completed.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.
- B. Perform the following operations immediately after completing floor tile installation:
 - 1. Remove adhesive and other blemishes from surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
 - 4. Do not wash or apply floor polishes until flooring adhesives have cured unless otherwise recommended by the flooring manufacturer.
- C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Floor Polish: Remove soil, adhesive, and blemishes from floor tile surfaces before applying liquid floor polish.
 - 1.
 - 2. Apply protective floor polish to horizontal surfaces that are free from soil, visible adhesive, and surface blemishes using methods as recommended in writing by the floor polish manufacturer. Apply no fewer than 2 coats of floor polish unless additional coats are recommended by the floor polish manufacturer for the application indicated.
 - a. Use commercially available product acceptable to manufacturer.
 - 3. Cover products installed on horizontal surfaces with undyed, untreated building paper until Substantial Completion.
 - 4. Do not move heavy and sharp objects directly over surfaces. Place hardboard or plywood panels over flooring and under objects while they are being moved. Slide or roll objects over panels without moving panels.
- E. Cover floor tile until Substantial Completion.

END OF SECTION

SECTION 09 68 13

TILE CARPETING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Modular carpet tile.

- B. Related Requirements:

- 1. Section 09 65 13 "Resilient Base and Accessories" for resilient wall base and accessories installed with carpet tile.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

- 1. Review methods and procedures related to carpet tile installation including, but not limited to, the following:

- a. Review delivery, storage, and handling procedures.
 - b. Review ambient conditions and ventilation procedures.
 - c. Review subfloor preparation procedures.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- 1. Include manufacturer's written data on physical characteristics, durability, and fade resistance.
 - 2. Include manufacturer's written installation recommendations for each type of substrate.

- B. Shop Drawings: For carpet tile installation, plans showing the following:

- 1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
 - 2. Carpet tile type, color, and dye lot.

3. Type of subfloor.
4. Type of installation.
5. Pattern of installation.
6. Pattern type, location, and direction.
7. Pile direction.
8. Type, color, and location of insets and borders.
9. Type, color, and location of edge, transition, and other accessory strips.
10. Transition details to other flooring materials.

C. Samples for Verification: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules:

1. Carpet Tile: Full-size Sample.
2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch-long Samples.

D. Product Schedule: For carpet tile. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For carpet tile, for tests performed by a qualified testing agency.
- C. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:
 1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
 2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association at the [Commercial II] [Master II] certification level.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.

1. Build mockups at locations and in sizes shown on Drawings.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Comply with the Carpet and Rug Institute's CRI 104.

1.10 FIELD CONDITIONS

- A. Comply with the Carpet and Rug Institute's CRI 104 for temperature, humidity, and ventilation limitations.
- B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at levels planned for building occupants during the remainder of the construction period.
- C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.
- D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

1.11 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
 1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
 2. Failures include, but are not limited to, the following:
 - a. More than 10 percent edge raveling, snags, and runs.
 - b. Dimensional instability.
 - c. Excess static discharge.
 - d. Loss of tuft-bind strength.
 - e. Loss of face fiber.
 - f. Delamination.
 3. Warranty Period: [10] years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CARPET TILE

- A. [CPT-1] Basis-of-Design: Tarkett Thread Craft 03366.
 - 1. Color: Friesian 13514.
 - 2. Installation: as selected by Architect.
 - 3. Electrostatic Propensity: AATCC-134, Less than 1.9 kv, permanent conductive fiber.
 - 4. Surface Flammability: ASTM D2859 passes.
 - 5. Smoke Generation: ASTM E662, Less than 450.
- B. [CPT-2] Basis-of-Design: Tarkett Hazard 11569.
 - 1. Color: Smolder 60804.
 - 2. Installation: as selected by Architect.
 - 3. Electrostatic Propensity: AATCC-134, Less than 1.8 kv, permanent conductive fiber.
 - 4. Surface Flammability: ASTM D2859 passes.
 - 5. Smoke Generation: ASTM E662, Less than 450.
- C. Primary Backing/Backcoating: Manufacturer's standard composite materials.
- D. Secondary Backing: Manufacturer's standard material.

2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type dots, to suit products and subfloor conditions indicated, that comply with flammability requirements for installed carpet tile, and are recommended by carpet tile manufacturer for releasable installation.
- C. Transition Strips: Rubber of profile and width shown, of height required to protect exposed edge of carpet, and of maximum lengths to minimize running joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance.
- B. Examine carpet tile for type, color, pattern, and potential defects.

- C. Concrete Slabs: Verify that finishes comply with requirements specified in Section 03 3000 "Cast-in-Place Concrete" and that surfaces are free of cracks, ridges, depressions, scale, and foreign deposits. Perform moisture testing, as required by the carpet manufacturer.
1. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
 - a. Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
 - b. Relative Humidity Test: Using in situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
 - c. Perform additional moisture tests recommended in writing by adhesive and carpet tile manufacturers. Proceed with installation only after substrates pass testing.

3.2 PREPARATION

- A. General: Comply with the Carpet and Rug Institute's CRI 104 and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile.
- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider, and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer's written instructions.
- C. Concrete Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by adhesive and carpet tile manufacturers.
- D. Metal Substrates: Clean grease, oil, soil and rust, and prime if recommended in writing by adhesive manufacturer. Rough sand painted metal surfaces and remove loose paint. Sand aluminum surfaces, to remove metal oxides, immediately before applying adhesive.
- E. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.3 INSTALLATION

- A. General: Comply with the Carpet and Rug Institute's CRI 104, Section 10, "Carpet Tile," and with carpet tile manufacturer's written installation instructions.
- B. Installation Method: Glue down; install every tile with full-spread, releasable, pressure-sensitive adhesive.
- C. Maintain dye-lot integrity. Do not mix dye lots in same area.
- D. Maintain pile-direction patterns indicated on Drawings.

- E. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
- F. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- G. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on carpet tile as marked on subfloor. Use nonpermanent, nonstaining marking device.
- H. Install pattern parallel to walls and borders.
- I. Access Flooring: Stagger joints of carpet tiles so carpet tile grid is offset from access flooring panel grid. Do not fill seams of access flooring panels with carpet adhesive; keep seams free of adhesive.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet tile:
 - 1. Remove excess adhesive and other surface blemishes using cleaner recommended by carpet tile manufacturer.
 - 2. Remove yarns that protrude from carpet tile surface.
 - 3. Vacuum carpet tile using commercial machine with face-beater element.
- B. Protect installed carpet tile to comply with the Carpet and Rug Institute's CRI 104, Section 13.7.
- C. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION

SECTION 09 90 00
PAINTING AND COATING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes surface preparation and the application of paint systems complete and as shown.
- B. Related Requirements:
 - 1. Shop Priming of Ferrous Metal Items: Sections 05 50 00, 05 70 00, and other applicable sections.
 - 2. Shop Finishing of Architectural Woodwork and Casework: Section 06 40 23.

1.3 SYSTEM DESCRIPTION

- A. General: Paint every surface, except as otherwise shown or as follows:
- B. Surfaces Not to be Painted:
 - 1. Factory-finished items specified in various Sections.
 - 2. Prefinished wall, ceiling, and floor coverings.
 - 3. Painting specified elsewhere and included in respective Sections, including but not necessarily limited to, shop priming.
 - 4. Code-Required Labels: Keep equipment identification and fire rating labels free of paint.
 - 5. Surfaces concealed in walls and above ceilings except as specifically indicated otherwise.
 - 6. Ducts, piping, conduit, and equipment concealed in walls and ceilings, unless specifically indicated otherwise.

1.4 SUBMITTALS

- A. Product Data: Submit for Architect's action. Submit manufacturer's literature and installation instructions for each material and accessory, clearly notating specified requirements.

- B. Samples: Submit for Architect's action. Furnish sufficient samples to establish full range of colors and textures for materials exposed in the finished Work. Label samples to indicate product and location in the Work. Samples will be reviewed for appearance only. Compliance with other requirements is the responsibility of the Contractor.
 - 1. Opaque Colors and Finishes: Submit samples, using materials accepted for Project, of each color and paint finish selected with texture to simulate actual conditions. Prepare three samples, 8-1/2 inches by 11 inches, with required number of paint coats clearly visible.
 - 2. Transparent and Stained Finishes: Prepare samples on species and quality of wood to be used in the Work. Resubmit as requested until acceptable sheen, color, and texture are achieved. Label and identify each sample as to location and application.
- C. Quality Assurance/Quality Control Submittals: Submit for Architect's information.
 - 1. Certificates:
 - a. Document Review: Submit a written statement signed by the Contractor and the Applicator stating that the Contract Documents, shop drawings and product data have been reviewed with qualified manufacturer representatives. The statement shall certify that selected materials are proper, compatible with contiguous materials and adequate for the application shown.
 - b. Installer's Qualifications

1.5 QUALITY ASSURANCE

- A. Qualified Installer: Installer to have 5 years' experience in the installation of specified materials on comparable projects. The firm shall have the approval of the materials manufacturer.
- B. Regulatory Requirements: Comply with applicable requirements of the laws, codes, and regulations of Authorities Having Jurisdiction (AHJs), including the Air Quality Management District. Obtain necessary approvals from AHJs.
- C. Visual Mock-Up(s): As directed by the Architect, apply on actual wall surfaces where designated, samples of each and any color selected for final review.
 - 1. On at least 100 square feet of surface as directed, provide full-coat finish samples until required sheen, color and texture are obtained.
 - 2. Duplicate painted finishes of prepared samples.
 - 3. Simulate finished lighting conditions for review of in-place work.
- D. Labeling: Include following on label of each container:
 - 1. Manufacturer's name and product name.
 - 2. Generic type of paint.
 - 3. Manufacturer's stock number.
 - 4. Color.
 - 5. Instructions for reducing, where applicable.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Packing, Shipping, Handling, and Unloading: Deliver material in sealed containers with labels legible and intact.
- B. Storage and Protection:
 - 1. Store only acceptable Project materials on Project site.
 - 2. Restrict storage to paint materials and related equipment.

1.7 PROJECT/SITE CONDITIONS

- A. Comply with manufacturer's recommendations as to environmental conditions under which coatings and coating systems can be stored and applied.
- B. Do not apply finish in areas where dust is being generated.

1.8 MAINTENANCE

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: 5 percent, but not less than 1 gallon of each material and color applied.
 - a. At completion of Work, deliver to Owner extra stock of paint of each color used of each coating material used. Tightly seal and clearly label containers.

1.9 WARRANTY

- A. Minimum 2-Year warranties shall be provided for all installed material and equipment unless more stringent requirements are noted in this section. Standard Manufacturer Warranties shall be provided where they exceed minimum warranty requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Paints:
 - 1. Campus Standard: Kelly Moore, www.kellymoore.com.
 - 2. Substitutions: Not allowed.
- B. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 PAINTS AND COATINGS - GENERAL

- A. Paints and Coatings: Ready mixed, except field-catalyzed coatings. Prepare pigments:
 - 1. To a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating.

2. For good flow and brushing properties.
 3. Capable of drying or curing free of streaks or sags.
- B. Volatile Organic Compound (VOC) Content:
1. Provide coatings that comply with the most stringent requirements specified in the following:
 - a. Architectural coatings VOC limits of State in which the project is located.
 - c. Anti-corrosive anti-rust paints applied to interior ferrous metal substrates and VOC content limits-Green Seal Standard GC-03.
- C. Chemical Content: The following compounds are prohibited:
1. Aromatic Compounds: In excess of 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
 2. Acrolein, acrylonitrile, antimony, benzene, butyl benzyl phthalate, cadmium, di (2-ethylhexyl) phthalate, di-n-butyl phthalate, di-n-octyl phthalate, 1,2-dichlorobenzene, diethyl phthalate, dimethyl phthalate, ethylbenzene, formaldehyde, hexavalent chromium, isophorone, lead, mercury, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, naphthalene, toluene (methylbenzene), 1,1,1-trichloroethane, vinyl chloride.

2.1 PAINT SYSTEMS

- A. Schedule: Only major areas are scheduled. Treat miscellaneous and similar items and areas within room or space with similar system.
- B. Number of Coats: Where number of coats is specified, it is only as a minimum requirement. Apply additional coats, at no additional cost to Owner, if necessary to completely hide base material, produce uniform color, and provide satisfactory finish result.
- C. Systems Specifications: These specifications are a guide and are meant to establish procedure and quality. Confer with Architect to determine exact finish desired.
- D. Acceptance of Final Colors: Do not apply final coats of paint for interior systems until colors have been accepted by Architect.
- E. Exterior Painting Systems:
1. High Performance Polyurethane Enamel Coating System:
 - a. Prime Coat: Shop-applied under other applicable Sections.
 - 1) Touch up shop primer where needed with Ameron Amerlock VOC.
 - 2) Benjamin Moore/Corotech #V155 High Solids Epoxy Pre-Primer.
 - b. Finish Coats:
 - 1) Ameron Amershield VOC
 - 2) Tnemec's Series 1095 (1094 or 1096) Endura-Shield, semi-gloss (gloss) sheen, 5 mils dry film thickness.
 - 3) Benjamin Moore/Corotech #V500 Acrylic Urethane Gloss.
 2. Galvanized Steel, Zinc-Rich Painted Steel, and Aluminum:
 - a. Prime Coat:
 - 1) Benjamin Moore HP04 Acrylic Metal Primer.

- b. Body Coat:
 - 1) Benjamin Moore N449 Ultra Spec EXT Gloss 100% Acrylic Gloss.
 - c. Finish Coat:
 - 1) Benjamin Moore N449 Ultra Spec EXT Gloss 100% Acrylic Gloss.
3. Cement Plaster, Fibercement Board:
- a. Prime Coat:
 - 1) Benjamin Moore: Sure Seal Latex Primer Sealer #027.
 - b. Body Coat:
 - 1) Benjamin Moore: Ultra Spec EXT Series 100% Acrylic.
 - c. Finish Coat:
 - 1) Benjamin Moore: Ultra Spec EXT Series 100% Acrylic.
- F. Interior Painting Systems:
- 1. Gypsum Board (Enamel Finish):
 - a. Prime Coat:
 - 1) Benjamin Moore Ultra Spec 500 Interior Primer 534 OR Fresh Start Multi Purpose Primer 023
 - b. Body Coat:
 - 1) Benjamin Moore Ultra Spec 500 Interior Latex Eggshell Finish 538 or Benjamin Moore Ultra Spec 500 Interior Latex Semi-Gloss Finish 539 OR the following:
Natura Interior Latex Eggshell Finish 513 or Benjamin Moore Natura Interior Latex Semi-Gloss Finish 514.

Aura Interior Latex Eggshell Finish 524 or Benjamin Moore Aura Interior Latex Semi-Gloss Finish 528-
 - c. Finish Coat:
 - 1) Benjamin Moore Ultra Spec 500 Interior Latex Eggshell Finish 538 or Benjamin Moore Ultra Spec 500 Interior Latex Semi-Gloss Finish 539. Natura Interior Latex Eggshell Finish 513 or Benjamin Moore Natura Interior Latex Semi-Gloss Finish 514.

Aura Interior Latex Eggshell Finish 524 or Benjamin Moore Aura Interior Latex Semi-Gloss Finish 528

2. Gypsum Board (Acrylic Epoxy Finish):
 - a. Prime Coat:
 - 1) Benjamin Moore: Ultra Spec 500 Interior Primer 534.
 - b. Body Coat:
 - 1) Benjamin Moore: Corotech: PreCatalyzed Waterborne Epoxy Eggshell #V342.
 - c. Finish Coat:
 - 1) Benjamin Moore: Corotech: PreCatalyzed Waterborne Epoxy Eggshell #V342.
 3. Steel (Clear Finish - Decorative):
 - a. First Coat:
 - 1) Sherwin-Williams: Permalac NT, Air Dry Acrylic Lacquer.
 - b. Finish Coat:
 - 1) Sherwin-Williams: Permalac NT, Air Dry Acrylic Lacquer.
 4. Wood (Enamel)
 - a. Prime Coat:
 - 1) Benjamin Moore 023 Fresh Start All Purpose 100% Acrylic Primer.
 - b. Body Coat:
 - 1) Benjamin Moore Natura Interior Latex Semi-Gloss Finish 539.
 - c. Finish Coat:
 - 1) Benjamin Moore Natura Interior Latex Semi-Gloss Finish 539.
- G. Miscellaneous Interior Painting Systems:
1. Ductwork at Grilles and Diffusers: Apply to visible interior surfaces of ductwork.
 - a. Body Coat:
 - 1) Benjamin Moore D.T.M. HP29 Semi-Gloss Finish.
 - b. Body Coat:
 - 1) Benjamin Moore: Not applicable.
 - c. Finish Coat:
 - 1) Benjamin Moore D.T.M. HP29 Semi-Gloss Finish.
 2. Exposed Ceilings, Insulated Pipes and Ductwork: (Passivated metal must be tested for adhesion)
 - a. Prime Coat:
 - 1) Benjamin Moore 027 Sure Seal Primer Sealer. Omit sealer where glass fabric jackets are used.
 - b. Intermediate Coat:

- 1) Benjamin Moore: As specified for exposed non-insulated pipes, conduits, and ductwork
- c. Finish Coat:
 - 1) Benjamin Moore: As specified for exposed non-insulated pipes, conduits, and ductwork
3. Exposed Non-Insulated Pipes and Ductwork (Cast Iron Pipe)
 - a. Prime Coat:
 - 1) Benjamin Moore HP04 D.T.M. Acrylic Metal Primer.
 - b. Body Coat:
 - 1) Benjamin Moore Ultra Super 500 Eggshell 538 or Semi-Gloss Finish 539. OR
Benjamin Moore Natura 513 or Aura 524 in Eggshell or Natura 539 or Aura 528 in Semi-Gloss Finish.
 - c. Finish Coat:
 - 1) Benjamin Moore Ultra Super 500 Eggshell 538 or Semi-Gloss Finish 539. OR
Benjamin Moore Natura 513 or Aura 524 in Eggshell or Natura 539 or Aura 528 in Semi-Gloss Finish.
4. Exposed Non-Insulated Pipes and Ductwork (Other Pipes, Conduit, and Ductwork)
 - a. Prime Coat:
 - 1) Benjamin Moore: HP04 D.T.M. Acrylic Metal Primer.
 - b. Body Coat:
 - 1) Benjamin Moore: HP28 D.T.M. Semi-Gloss Finish.
 - c. Finish Coat:
 - 1) Benjamin Moore: HP28 D.T.M. Semi-Gloss Finish.
5. Factory Finished Equipment: Satisfactorily refinish surfaces damaged before, during, or after installation as directed.
 - a. Benjamin Moore Ultra Spec 500 Semi-Gloss Finish 539.
Benjamin Moore Natura 539 or Aura 528 Semi-Gloss Finish.
6. Finish Hardware: Specified with USP finish under Section 087000, paint as specified for metal. Color and gloss to match doors and frames as applicable, unless otherwise specified.
7. Plywood Backing: In Telephone and Electric Closets; provide one coat
 - a. Benjamin Moore: One coat 023 Fresh Start All Purpose 100% Acrylic Primer and one coat Benjamin Moore Ultra Super 500 Eggshell 538.
Benjamin Moore Natura 513 or Aura 524 in Eggshell.
8. Stair Nosings:
 - a. General: On top and bottom nosing of each run, paint 2-inch-wide stripe parallel to and not more than one inch from edge.

- b. Application: Type and number of coats recommended by paint manufacturer for durability and slip-resistance on applicable type substrate; contrasting color as selected.

H. Pipe Identification:

1. General: Per ANSI A13.1; buried pipe, electrical conduit, and pipe in concealed spaces such as furred spaces and shafts not included.
2. Color Scheme: ANSI Z53.1 in combination with legend and flow markers; intermittent displays. Locate and space as specified for legend and flow markers. Safety colors as specified under applicable mechanical Section.
3. Legend: Stencil letters of colors, type, and sizes per ANSI A13.1. Tags for identification of pipes less than 3/4 inch overall outside diameter, including valves and fittings; provided under applicable mechanical Section.
4. Flow Markers: Provide each type with appropriate size arrows to indicate flow direction in pipe; same color as legend.
5. Visibility: Locate legend and flow markers for easy visibility from operating floor; space not over 20 feet with at least one per room.

2.5 ACCESSORY MATERIALS

- A. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified; commercial quality.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 - EXECUTION

3.1 GENERAL

- A. Manufacturer's Instructions: Prepare substrates, apply primers and apply the work, including components and accessories in accordance with the manufacturer's instructions, except where more stringent requirements are shown or specified. Examine the areas to receive the Work and remedy detrimental conditions.

3.2 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Moisture Content: Do not apply initial coating until moisture content of surface is within limitations recommended by paint manufacturer.

- C. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Concrete: 12 percent.
 - 2. Masonry (CMUs): 12 percent.
 - 3. Wood: 15 percent.
 - 4. Gypsum Board: 12 percent.
 - 5. Plaster: 12 percent.
- D. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- E. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- F. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.3 SURFACE PREPARATION

- A. General: Remove scale, dirt, dust, grit, rust, wax, grease, efflorescence, loose material, and other foreign matter detrimental to proper adhesion of paint.
- B. Cementitious Surfaces:
 - 1. General: Remove oil, grease, loose particles, bond breaker coating and other foreign materials.
 - 2. Cracks: Greater than 1/32-inch-wide; rout out to not less than 1/4-inch-wide and 1/4-inch-deep; fill groove with gun grade sealant and cap with buttering grade sealant. Cracks less than 1/33-inch-wide; cap with buttering grade sealant. Repair minor cracks and holes; roughen when necessary to assure good adhesion.
 - 3. Alkali Conditions: Test surfaces for presence of alkali. If present, neutralize as recommended by paint manufacturer, after drying remove precipitate by brushing. Do not paint if pH is above 12.
- C. Gypsum Board:
 - 1. Narrow, Shallow Cracks and Small Holes: Fill with spackling compound.
 - 2. Deep, Wide Cracks and Deep Holes: Rake out, dampen with clear water, and fill with thin layers of gypsum board joint compound.
 - 3. Curing: Allow to dry.
 - 4. Sanding: Sand smooth after drying; do not raise nap of paper on gypsum board.
- D. Metals:
 - 1. Chipped or Abraded Areas in Shop Coatings: Touch-up using appropriate primer.
 - 2. Galvanized Surfaces: Apply a wash coat of Jasco's Prep 'n' Prime. Allow to dry completely.
 - 3. Stainless Steel: Scarify surfaces before applying prime coat.

- E. Wood:
1. General: If required, sandpaper surfaces smooth before applying primer. Thoroughly clean knots; apply thin coat of knot sealer over surfaces shown to receive opaque finish.
 2. Back Priming: Back prime surfaces installed against cementitious surfaces; give particular attention to sealing cross-grained surfaces.
 3. Puttying:
 - a. General: Fill nail holes, cracks, and other depressions flush with putty after prime coat application. Allow putty to dry; sandpaper smooth before applying body coat.
 - b. For Opaque Finish: Linseed oil type putty.
- F. Protection:
1. General: Properly protect floors and other adjacent work by drop cloths or other suitable coverings. In areas scheduled for painting, maintain wrappings and factory-applied protection provided by other trades.
 2. Hardware and Other Obstructions: Remove or protect factory finished items such as hardware, plates, lighting fixtures, grilles, and similar items placed prior to painting. Reposition or remove protection upon completion of each space. Equipment adjacent to surfaces requiring paint disconnected, moved, reset, and reconnected by respective trades.
 3. Fire Precautions: At end of each work day, place in metal containers or remove from premises, solvent soaked cloths, waste, and other materials which constitute a fire hazard.
- G. Moisture Content: Do not apply initial coating until moisture content of surface is within limitations recommended by paint manufacturer.

3.4 APPLICATION

- A. General: Apply paint per manufacturer's instructions and as specified. Thoroughly stir paint and keep at uniform consistency during application. Apply paint evenly, free from drops, ridges, waves, laps, and brush marks; finished surface uniform in sheen, color, and texture. Apply succeeding coats to unscarred and completely integral base coats; slightly vary color of undercoats to distinguish them from preceding coat. Allow sufficient time between coats to assure proper drying. Sandpaper smooth interior finishes between coats.
- B. Prime Coat: Do not thin primers in excess of manufacturer's printed directions. Apply by brush, unless otherwise specified, within 8 hours after cleaning.
- C. Body and Finish Coats: Do not thin; apply by brush, roller or spray.
- D. Drying Time: Comply with recommendations of product manufacturer for drying time between succeeding coats.
- E. Moldings and Ornaments: Leave clean and true to details with no undue amount of paint in corners and depressions.

- F. Edges of Paint: Where adjoining other materials or colors, make clean and sharp with no overlapping.
- G. Refinishing: Refinish entire wall where portion of finish is deemed not acceptable.
- H. Precaution: Do not paint over fusible links, UL labels, or sprinkler heads.
- I. Exposed Plumbing and Mechanical Items: Finish items without factory finish such as conduits, pipes, access panels, and items of similar nature to match adjacent wall and ceiling surfaces, unless otherwise directed.

3.5 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
 - 1. Contractor shall touch up and restore painted surfaces damaged by testing.
 - 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.6 CLEANING

- A. General: Touch up and restore finish where damaged. Remove spilled, splashed, or spattered paint from surfaces. Do not mar surface finish of item being cleaned.
- B. Storage Space: Leave clean and in condition required for equivalent spaces in Project.

3.7 SHEEN SCHEDULE

- A. General Gypsum Board Ceilings – Flat Finish.
- B. Gypsum Board Walls – Eggshell Finish.
- C. Interior Architectural Woodwork, Finish Carpentry, and Wood Doors (softwoods, paint grade hardwoods, MDF, MDO, and hardwood veneers) – Semi-Gloss except as noted on drawings.
- D. Concrete Masonry Unit (CMU) – Eggshell Finish.
- E. Interior Metals (Not specified to receive other coating systems/not shop finished) – Semi-Gloss.

END OF SECTION

SECTION 09 96 00

HIGH PERFORMANCE COATINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section

1.2 SUMMARY

- A. Work Included: High Performance Coatings, complete as shown and specified.

1.3 REFERENCES

- A. General: Comply with the applicable provisions of the referenced standards, except as modified by governing codes and the Contract Documents. Where a recommendation occurs in the referenced standards, it shall be considered mandatory. In the event of conflict, the more stringent standard or requirement shall govern.
 - 1. American Architectural Manufacturers Association (AAMA)
 - a. AAMA 2605 "Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Architectural Extrusions and Panels".

1.4 SUBMITTALS

- A. General: Submit the following in conjunction with submittals required for substrates, specified in other Sections.
- B. Product Data: Submit for Architect's action. Submit manufacturer's literature, specifications and application instructions describing the general properties of each material and accessory to be used in the Work. For each type of product. Include preparation requirements and application instructions.
 - 1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
 - 2. Indicate VOC content.
- C. Samples: Provide in accordance with other Sections that reference this Section. Label samples to indicate product and location in the Work. Samples will be reviewed for color and appearance only. Compliance with other requirements is the responsibility of the Contractor.
- D. Quality Assurance/Quality Control Submittals: Submit for Architect's information.
 - 1. Certificates:
 - a. Document Review: Submit a written statement signed by the Contractor and the Applicator stating that the Contract Documents, shop drawings and product data have been reviewed with qualified manufacturer representatives. The statement

shall certify that selected materials are proper, compatible with contiguous materials and adequate for the application shown.

- b. Applicator Qualifications.

1.5 QUALITY ASSURANCE

- A. Qualified Applicator: Applicator to have 5 years' experience in the installation of specified materials on comparable projects. The firm shall have the approval of the materials manufacturer.

1.6 WARRANTY

- A. Warranty: Submit for Owner's documentation. Warranty shall be for a 20 year period, signed by the Contractor, manufacturer, and installer, against the loss of film integrity, chalking, fading, non-uniformity, corrosion and overall performance of colors and from defects in materials or workmanship. Make repairs and replacements upon notification of defects.
 - 1. Color retention not to exceed 5 Δ E Units (Hunter) color change as calculated in accordance with ASTM D2244 on exposed surfaces cleaned with clean water and a soft cloth.
 - 2. Degree of chalking not to exceed rating No. 8 for colors and No. 6 for whites when measured in accordance with ASTM D4214 Test Method, Test Method A on exposed unwashed surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Products specified are those as manufactured by Master Coating Technologies. Items specified are to establish a standard of quality for design, function, materials, and appearance. Equivalent products by listed manufacturers are acceptable. The Architect will be the sole judge of the basis of what is equivalent.
- B. Performance:
 - 1. VOC: Coatings shall have less than 110 g/l of VOC's.
 - 2. Fire Rating: Coatings shall be Type I or Class A fire-rated, ASTM E 84.
 - 3. Scrub Test: Greater than 25,000 cycles, ASTM D 2486.
 - 4. Impact Resistance: Greater than 160 in/lbs, ASTM D 2794.
 - 5. Chemical Resistance: 10 (test maximum) for all chemicals tested, ASTM D 1308.
 - 6. QUV Accelerated Weathering: Greater than 95 percent gloss retention after 500 hours, ASTM G 53.
 - 7. Stain Removal: 8 to 10 (test maximum) for all stains tested, four-hour Open Spot Test.
- C. Substitutions: See Section 01 60 00 - Product Requirements.
 - 1. Submit proposed substitution to the Architect per 01 60 00
 - 2. Submit finish samples to match color of specified finishes, product data, application instructions, test reports, etc. Clearly indicate discrepancies between specified product and proposed substitution.

2.2 MATERIALS

- A. Primer: Provide primer recommended by manufacturer for substrate.
 - 1. Concrete and Masonry: Suitable heavy-bodied latex vinyl acrylic block filler (if filling pores is desired). Provide manufacturer's recommended product if uniform base color with pores exposed is desired.
 - a. Basis of Design: "Primemaster Primer/Sealer," Master Coating Technologies.
 - 2. Primed Metals: No primer required.
 - 3. Unprimed Metals: In accordance with the manufacturer's recommendations.
 - 4. New Gypsum Board:
 - a. Basis of Design: "Primemaster Primer/Sealer," Master Coating Technologies.
 - 5. Ceramic Tile and Glazed Block:
 - a. Basis of Design: "Primemaster Bonding Primer," Master Coating Technologies.
 - 6. Vinyl Wall Covering and Plastic: In accordance with the manufacturer's recommendations.
- B. Textured Finish System Components:
 - 1. Base Coat: Water-based polyurethane/acrylic base coat and cross-linker.
 - a. Basis of Design: "Scuffmaster PC200," Master Coating Technologies.
 - 2. Pattern Coat: Water-based polyurethane/acrylic pattern coat and cross-linker.
 - a. Basis of Design: "Scuffmaster AC1200", "Scuffmaster AC1200", or "Scuffmaster AC1200M," Master Coating Technologies.
 - 3. Miscellaneous Materials: Surface patching compounds and other materials necessary for application of finish system shall be of high quality and compatible with coating system.

2.3 EQUIPMENT

- A. Spray or roll primers and base coats in accordance with manufacturer's instructions.
- B. Spray pattern coats using manufacturer's proprietary spray equipment only. Contact local manufacturer representative or contact the manufacturer before bidding this work.

PART 3 – EXECUTION

3.1 PREPARATION

- A. General: Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
- C. Clean substrates of substances that could impair bond of coatings, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
- D. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer, but not less than the following:
 - 1. SSPC-SP 10/NACE No. 2, "Near-White Blast Cleaning."

- E. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- F. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied coatings.
- G. Aluminum Substrates: Remove loose surface oxidation.

3.2 APPLICATION

- A. Apply high-performance coatings according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
 - 1. Use applicators and techniques suited for coating and substrate indicated.
 - 2. Coat surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, coat surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Coat backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Do not apply coatings over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

3.3 STEEL SUBSTRATES

- A. General: Apply paint per manufacturer's instructions and as specified. Thoroughly stir paint and keep at uniform consistency during application. Apply paint evenly, free from drops, ridges, waves, laps, and brush marks; finished surface uniform in sheen, color, and texture. Apply succeeding coats to unscarred and completely integral base coats; slightly vary color of undercoats to distinguish them from preceding coat. Allow sufficient time between coats to assure proper drying. Sandpaper smooth interior finishes between coats.
- B. Prime Coat: Do not thin primers in excess of manufacturer's printed directions. Apply by brush, unless otherwise specified, within 8 hours after cleaning.
- C. Body and Finish Coats: Do not thin; apply by brush, roller or spray.
- D. Drying Time: Comply with recommendations of product manufacturer for drying time between succeeding coats.

3.4 ALUMINUM SUBSTRATES

- A. Touch-Up to Fluoropolymer Coating System: Touch up damaged, scratched, marred or abraded exposed fluoropolymer coating, using an approved air dried fluoropolymer resinous paint system in matching colors and sheen. Touch-up coating system shall meet local VOC requirements. Obtain Architect's approval of finished touch-up.

3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

- C. Protect work of other trades against damage from coating operation. Correct damage by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

END OF SECTION

SECTION 10 14 00

SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes: Exterior signage for the following:
 - 1. Building accessibility signage.
 - 2. Dimensional characters.
 - 3. Exterior tactile signage
 - 4. Building number identification.
 - 5. Wayfinding signs.
 - 6. Building information signage.
 - 7. No smoking signage.
 - 8. Self-adhering sheet air and water barriers at exterior walls.
 - 9. Underlayment at metal standing seam roof.

- B. Interior signage for the following:
 - 1. Directional signage, including egress signage.
 - 2. Elevator lobby maps.
 - 3. Stairway floor number signs.
 - 4. Restroom signage.
 - 5. Wall-mounted blade signage.
 - 6. Tactile signs.
 - 7. Life-safety signage.
 - 8. Vinyl window graphics
 - 9. Vinyl wall graphics
 - 10. Stairway identification signs
 - 11. Tactile directional maps
 - 12. Vestibule signage.

1.3 PREINSTALLATION MEETINGS

- A. Sign locations shown on the location plans are for general information only. Prior to installation and as required, arrange meetings with the Architect at the site for final location for all sign items.

1.4 ACTION SUBMITTALS

- A. Schedule: Within 7 calendar days of contract award the Contractor shall submit a detailed Gantt chart schedule showing all task durations and milestones from contract inception through warranty period. Contractor shall identify on the schedule shop drawing and sample reviews with time for revision and resubmission. Schedule shall also include dates and durations for:
 - 1. Deadline for designer supplied digital artwork.
 - 2. Dates for Engineering and Building Department approval.
 - 3. Installation of sign supports that need to be installed prior to building contractor installation of architectural finishes
 - 4. Installation of signs that go on completed architectural finishes
- B. Structural Design and Engineering: Details in the Drawings indicate a general design approach for sign structures but do not necessarily include the specific fabrication details required for the complete structural integrity of the signs, nor do they necessarily consider preferred shop practices of individual contractors. Specific fabrication details shall be provided by the Contractor, who shall ensure that all signs withstand any and all static, dynamic and/or erection loads that act upon them, including all such loads associated with handling, erecting, and servicing. Include calculations with engineering drawings, signed by a licensed Engineer currently registered in the State of California.
- C. Engineering and Building Department Approval. Contractor shall be responsible for the engineering and internal construction of all signs, incorporating all reasonable safety factors. Freestanding signs shall have their structural supports designed and stamped by a licensed Engineer currently registered in the State of California. Any sign requiring engineering needs to be approved by building department. Contractor must obtain favorable review prior to installing signage. Shop drawings shall bear engineers stamp and signature. Time for building department review and resubmittal shall be included in the Contractor's schedule.
- D. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of sign.
- E. Shop Drawings: Include plans, elevations, and large-scale sections of typical members and other components. Show mounting methods, grounds, mounting heights, layout, spacing, reinforcement, accessories, and installation details.
 - 1. Provide message list for each sign, including large-scale details of wording, lettering, artwork, and Braille layout.
 - 2. Furnish message list for each sign required, including large scale details of wording and layout of lettering.
 - 3. For signs supported by or anchored to permanent construction, furnish setting drawings, templates, and directions for installation of anchor bolts and other anchors.
 - 4. Furnish full-size spacing templates for individually mounted dimensional letters and numbers.
- F. Samples: Submit 4 sets of samples of each lettering type, finish, color and exposed material to be used in the Work. Label samples to indicate product, characteristics and locations in the Work. Sample submittal and Designer's acceptance shall be for color, pattern and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor.
 - 1. See list below for primary samples:

- a. 24" x24" digitally printed graphic on clear vinyl
- b. 24" x 24" digitally printed graphic on vinyl
- c. 4" x 4" of all paint samples
- d. 1/8" thick steel plate with digital printing
2. Prototypes: Submit one full-size complete, unless otherwise indicated.
 - a. Sign Type A3
 - b. Sign Type B1
 - c. Sign Type C1
 - d. Sign Type H
 - e. Sign Type Q
 - f. Sign Type R
- G. Elevator Lobby Map: Prior to fabrication submit to the Architect for approval a schematic map for all floors of the building for use as a fire evacuation map.
- H. Graphic Images:
 1. Submit full size patterns or prints of typical copy layouts and/or graphic elements to be applied on signs. Using layouts on the Drawings as a guide, optically enlarge and hand correct images before submitting to the Architect for approval before fabrication.
 2. Finished art of Project symbols and arrows will be provided by the Architect for photoenlargement to full-size dimensions shown on the Drawings. After photo enlargement, submit to the Architect for approval before fabrication.
 3. Elevator Lobby fire evacuation map art shall be schematically presented. Submit camera ready artwork for all floors to the Architect for approval prior to fabrication.
- I. Sign Location: Provide Graphic Schedule and location plans to identify and locate all signs. Item numbers listed in the Graphic Schedule shall be found on location plans and shall identify locations of specific sign items.
 1. Identification of signs shall be in accordance with contract documents.

1.5 INFORMATIONAL SUBMITTALS

- A. Statement of Application: Before commencing installation of the Work, submit written statement signed by Contractor and Installer stating they have completely examined the requirements of the Contract Documents and the manufacturer's instructions, the areas in which the Work would be installed, and the conditions under which the Work would be performed. The statement shall stipulate Contractor and Installer are in agreement that the substrates, the materials and application methods to be used in the Work comply with the requirements and are adequate and proper for the conditions of installation and use.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Provide the Owner with proper cleaning instructions required for continued maintenance of signs.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Maintenance Instruction: Furnish maintenance manual to instruct the Owner in procedures to be followed in cleaning and maintaining the signage. Provide manufacturer's brochures describing the actual materials used in the Work, including metal alloys and finishes.
- B. Include a list of cleaning materials appropriate for continued cleaning of signs. Include written instructions for proper maintenance, service access, replacement procedures, etc. Include

recommended methods for removal of residual adhesives from wall surfaces and glazing after removal of adhesive mounted signs.

- C. Extra Materials: Deliver to the Owner in manufacturer's original packaging and store at the project site where directed.
 - 1. Furnish one quart of each finish paint color for touch-up purposes.

1.8 REGULATORY REQUIREMENTS

- A. CBC and ADA Requirements: Compliance applies to interior signage, including Braille lettering.
- B. Provide signage at public toilet rooms.
- C. Provide signage at unit entry doors, 1/4-inch raised metallic unit number (polished chrome finish) with ADA compliant braille on 1/4-inch thick plaque below, finished to match numbers.
- D. Signage to be posted at all entry doors to building with 3" tall "No Smoking" pictogram at top followed by:
- E. Comply with the Americans with Disabilities Act (ADA) and with code provisions as adopted by authorities having jurisdiction.
 - 1. Interior Code Signage: Provide signage as required by accessibility regulations and requirements of authorities having jurisdiction. These include, but are not limited to, the following:
 - a. Fire doors.
 - b. Elevator signs.
 - c. Stairway identification.
 - d. Signs for accessible spaces.

1.9 QUALITY ASSURANCE

- A. Contractor shall have experienced and certified signage installers with a minimum of 5 years' experience installing signage and regularly engaged in installing signage work of the same type required for this project. Installer certification is required to install signs which include but not limited to electrical work, welding, and crane truck operation. Installers shall be skilled tradesmen who are thoroughly experienced with the materials and equipment to be used in the Work. Installation shall be supervised by a field supervisor with minimum 10 years' experience.
- B. Full Size Layouts: After review of finish samples and shop drawings, furnish full size layouts of each sign type before proceeding with final fabrication of the Work.
- C. In-progress Fabrication Review: Architect shall review specified signs during the fabrication process at fabricator's shop if located locally to Architect. If fabricator is not geographically accessible, fabricator shall provide appropriate in progress documentation in the form of photographs and/or video.
- D. Pre-installation Conference: Prior to commencing installation of the Work and at the Contractor's direction, meet at the project site to review the material selections, the field samples, installation procedures and coordination with other trades. Meeting shall include the Contractor, Installer, Architect, manufacturer's representatives, and any trade that requires coordination with the Work. Record meeting minutes in writing any oral instructions, and whether Contractor and Installer agree that the proposed installations are likely to perform as required.

- E. Regulatory Requirements: Comply with applicable requirements of the laws, codes, Americans with Disability Act (ADA), ordinances and regulations of Federal, State and Municipal authorities having jurisdiction. Obtain necessary approvals from all such authorities. The most stringent of applicable codes shall be used for the project.
- F. Trade Names: Do not display manufacturer's name, trade name, trademarks or similar markings on exterior or visible surfaces.
- G. UL Compliance: Provide lighting fixtures and electrical components which are UL-labeled and listed.
- H. Sign Quantity Count: Contractor shall be responsible for determining the final quantity count of all signs, as indicated on the Copy Schedule and Drawings, prior to fabrication. Quantities shown on the Sign Schedule are preliminary sign count estimates, to be used for preliminary budget estimates only. Contractor to verify signage quantities.

1.10 DELIVERY, STORAGE AND HANDLING

- A. General: Deliver and store materials in manufacturer's original packaging labeled with manufacturer's name, product description and other information required for identification. Store materials in protected dry location of ground in accordance with manufacturer's instructions. Protect materials from damage, warpage and deterioration. Inspect items upon delivery for damage. Minor damage may be repaired, provided the finished items are equal in all respects to new work and acceptable to the Architect, otherwise remove and replace damaged items as directed.
- B. Project/Site Conditions: Coordinate with the work of adjacent trades so as to prevent damage, interference or delay. Obtain templates, drawings, or other information as necessary for coordination, proper alignment and connection to such other work.

1.11 FIELD CONDITIONS

- A. Field Measurements: Verify locations of anchorage devices embedded in permanent construction by other installers by field measurements before fabrication, and indicate measurements on Shop Drawings.

1.12 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials, fabrication or installation within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Deterioration of finishes beyond normal weathering.
 - b. Deterioration of embedded graphic image.
 - c. Separation or delamination of sheet materials and components.
 - 2. Warranty Period: Five years from date of Substantial Completion.
- B. Finishes Warranty: Submit five-year written warranty, signed by the Contractor and Installer, warranting that the architectural signage finishes will not develop excessive fading or excessive non-uniformity of color or shade and will not crack, peel, pit or corrode or otherwise fail as a

result in defects or workmanship, within the following defined limits. Upon notification of such defects, within the warranty period, make necessary repairs or replacement at the convenience of the Owner.

1. "Excessive Fading": A change in appearance which is perceptible and objectionable as determined by the Designer when visually compared with the original color range standards.
 2. "Excessive Non-Uniformity": Non-uniform fading during the period of the guarantee to the extent that adjacent panels have a color difference greater than the original acceptable range of color.
 3. "Will Not Pit or Otherwise Corrode": No pitting or other type of corrosion discernible from a distance of 10'-0", resulting from the natural elements in the atmosphere at the project site.
- C. Replacement or Repairs: The Owner shall have the right to continue use of the defective part until such time that the part is replaced or repaired without loss or inconvenience to the Owner. Warranties shall also state that the replaced or repaired part shall have a warranty period equal to the remaining warranty period for the replaced or repaired part plus an additional one year.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, acceptable manufacturers include, but are not limited to, the following:
1. Interior Signage: Plastic signs, ASTM D4802, Category A-1, 1/4" overall thickness
 - a. ASI Modulex, Inc.
 - b. Mohawk Sign Systems, Inc.
 - c. Roemer Industries
 2. Dimensional Letters:
 - a. ASI Modulex LVT Series, 2 mil cast vinyl film of integral color.
 3. Exterior Signs: Cast-aluminum letters with a stain aluminum face. Mounted with threaded studs and collars, and silicone adhesive.
 - a. Gemini, Inc.
 - b. Matthews International Corporation.
 4. Tactile Directory Map: 3-D printed; manufacturer to be selected.

2.2 AESTHETIC REQUIREMENTS

- A. Copy shall be straight with letters properly spaced with typefaces accurately reproduced with square corners and even curves, letters and symbols uniform, and edges straight and true.
- B. Finishes shall be smooth and with no visible imperfections.

2.3 TYPOGRAPHIC REQUIREMENTS

- A. Type used shall be specified in the contract documents.
- B. Lettering shown on the drawings is intended as a guideline for layouts, type size and copy to be provided on individual signs, and is based on scale calculations of the message length within given and estimated sign areas. Notations contained within parenthesis () in the copy schedule of signs are instructions for logos or symbols that are to be included on the sign, as shown on the design drawings. Refer to the copy schedule of signs for copy, quantities, description of signs and reference to sign locations.

- C. Spelling and punctuation shall be correct. Should an error in spelling or punctuation be found, or the spelling appears questionable, notify the Architect.
- D. Align letter forms to maintain a baseline parallel to the sign format. Maintain margins as indicated in sign layouts.

2.4 MATERIALS, GENERAL

- A. General: Fabricate sign plates of the size, thickness and configuration indicated. Precision engrave the required letters, numbers or figures with uniform margins, in the letter style and size indicated, or as selected by the Architect from the manufacturer's standard fonts.
 - 1. Protect finished metal surfaces with 2 coats of clear, non-yellowing lacquer.
 - 2. Finish and Contrast. The characters and background of signs shall be eggshell, matte, or other non-glare finish.
 - 3. Characters and symbols shall contrast with their background –either light characters on a dark background or dark characters on a light background.
- B. Exterior Signage: Complying with ADA, 18 gage bonderized steel screen painted blue with white international disabled symbol.
- C. Interior Signage: Cast acrylic sheet, transparent, clear, semi-matte or non-glare, 0.125-inch thick, frameless signs, color TBD.
- D. Uncoated Monolithic 'Ecoresin' Sheets: ASTM D4812 for impact resistance and as follows:
 - 1. Smoke Density Rating: ASTM D2843, 75 percent maximum allowable.
 - 2. Combustion Rating: ASTM D635; CC1 rating (burn less than 1-inch minimum).
 - 3. Self-Ignition Temperature: ASTM D1929; 650 degrees F minimum.
 - 4. Surface Burning Characteristics: ASTM E84; Class B:
 - a. Flame Spread: 75 maximum.
 - b. Smoke Generated: 450 maximum.
- E. Pictograms, General:
 - 1. Pictograms (where provided) shall be accompanied by the equivalent verbal description placed directly below the pictogram. Pictograms are figures that depict what the words are stating.
 - 2. The border dimension of the pictogram shall be 6 in (152 mm) minimum in height (i.e. graphics enclosed within a maximum 6-inch square border).
- F. Applied Copy: Die-cut characters from vinyl film of nominal thickness of 1/32-inch with pressure-sensitive adhesive backing. Apply copy to exposed face of sign.
- G. Tactile and Braille Copy: Manufacturer's standard process for producing copy complying with 2022 CBC Section 11B requirements. Text shall be accompanied by Contracted Grade 2 Raster Braille. Produce precisely formed characters with square cut edges free from burrs and cut marks.
 - 1. Panel Material: Frosted acrylic sheet, aluminum sheet, stainless steel sheet as indicated on Drawings.
 - 2. Raised Characters: At least 5/8 in (16 mm) high, but no higher than 2 in (50 mm).
 - 3. Raised Letters and Numerals: 1/32 in, upper case, SANS SERIF or SIMPLE SERIF type
 - 4. Characters: 1/10-inch is required between each dot within a cell, measured from the dot centers. 2/10-inch is required between each cell within a word. Measure from the center of

the dots in the second column of the first cell to the center of the dots in the first column of the next cell. Dots must be a minimum of 1/40-inch high at the apex.

- H. Colored Coatings for Acrylic Sheet: For copy and background colors, provide Pantone Matching System (PMS) colored coatings, including inks and paints, that are recommended by acrylic manufacturers for optimum adherence to acrylic surface and are non-fading for application intended.
- I. Symbols of Accessibility: Provide 6-inch- (150-mm-) high symbol fabricated from opaque non-reflective vinyl film, 0.0035-inch (0.089-mm) nominal thickness, with pressure-sensitive adhesive backing suitable for both exterior and interior applications.

2.5 SIGN MATERIALS

A. Metal:

- 1. General: For the fabrication of exposed metal work, use only materials which are smooth and free of surface blemishes including pitting, roughness, seam marks, roller marks and trade names. Do not use materials which have stains and discoloration.
- 2. Aluminum / Cabinet / Extrusion Manufacturer: SignComp or similar.
- 3. Aluminum: Provide Aluminum Association Alloy 6063T5 or 6061T6 or as recommended to suit required service and finish.
- 4. Aluminum Extrusions: Provide the specific alloy and temper recommended by aluminum producer or finisher for type of use and finish indicated, and with not less than the strength and durability properties specified in ASTM B 221 for 6063-T5.
- 5. Fasteners, Hardware and Devices: Stock proprietary fastening devices of approved standard manufacture such as cadmium plated screws, bolts and washers, and stainless-steel hinges.
- 6. Welding Electrodes and Filler Metal: Provide the alloy and type required for strength, workability, compatibility and color match after grinding smooth and finishing the fabricated product.

B. Acrylic:

- 1. General: Edges shall be square to face and free from saw marks and chips. Edges shall be smooth and flame polished unless otherwise indicated. Use protective coating when acrylic is within reach of public or is being used for exterior applications. Refer to sign drawings for specific coating recommendations.
- 2. Acrylic Manufacturer: 3form, Acrylite, DuPont.
- 3. Cast Acrylic Sheet: Provide cast (not extruded or continuous cast) methyl methacrylate monomer plastic sheet with a minimum flexural strength of 16,000 psi, when tested in accordance with ASTM D790, minimum allowable continuous service temperature of 180 degrees F (82 degrees C); in sizes and thickness indicated; and in the following general types:
 - 4. Transparent Sheet: Where indicated as "clear" provide colorless sheet with light transmittance of 92%, when tested in accordance with ASTM D1003, in semi-matte finish, unless otherwise indicated.
 - 5. Opaque Sheet: Where indicated as "opaque" provide colored acrylic sheet in colors and finishes indicated, or if not indicated as selected from manufacturer's standards.
 - 6. Colored Coating for Acrylic Plastic Sheet: Use colored coatings, including inks and paints for copy and background colors, which are recommended by the acrylic manufacturer for optimum adherence to acrylic surfaces and are non-fading for application indicated.
 - 7. Vinyl Film: Non-reflective vinyl film, 0.0035" minimum thickness with pressure sensitive adhesive backing suitable for exterior as well as interior applications. Colors shall be integral and not surface applied. Paints, inks, dyes, and other materials used in the

process shall be compatible and guaranteed not to cause discoloration, deterioration or delamination.

8. Translucent vinyl to be used on illuminated signs and Opaque vinyl to be used on non-illuminated signs, as specified. Vinyl colors to be matched to Pantone Matching System (PMS) colors as specified on design drawings; vinyl color samples to be submitted to the Architect for final approval prior to fabrication.
9. Pre-spaced die-cut letters supplied in specified typeface, color, and spacing with a quick release, backing sheet.

C. Wood:

1. All materials and fabrication of all work shall comply with the "Premium Grade" requirements of Architectural Woodwork Quality Standards" published by the Architectural Woodwork Institute (AWI).
2. Provide samples of specified materials as shown on drawings or to match Architect's samples.
3. Factory finish on all materials shall match Architect's sample.
4. MDF: ANSI A208.2, Grade 130, made with binder containing no urea-formaldehyde resin.

D. Wood Veneer and Finish: See Section 06 4100 Architectural Woodwork.

E. Miscellaneous Materials:

1. Provide adhesive, sealant, and other necessary materials as best suited for the purpose.

2.6 PANEL SIGN COMPONENTS

A. General:

1. Panel signs to comply with requirements indicated for materials, thickness, finishes, colors, designs, shapes, sizes and details of construction.
2. Produce smooth, even, level sign panel surfaces, constructed to remain flat under installed conditions.

B. Panel Signs: Panel signs mechanically and smoothly finished to conform with the following requirements:

1. Corner Condition: See design drawings
2. Edge Condition: See design drawings

C. Subsurface Graphic Panel/Plaque: Sign Copy is applied to front surface of non-glare, acrylic plastic; thickness as specified on design drawings or construction details. Opaque paint/digital print is applied to back. All inks used to be acrylic lacquer. Digital material substrate specified on design drawings

D. Cut-out Letters and Numbers: Cut aluminum or acrylic letters to have precisely cut characters with square cut, smooth edges.

E. Graphic Image Process:

1. Graphic Content and Style: Provide sign copy to comply with requirements indicated for sizes, styles, spacing, content, positions, materials, finishes and colors of letters, numbers, symbols and other graphic elements.

- F. Etched Copy (in metal): Photographically precise artwork (letters, numbers, symbols, logos) etched into metal panel indicated to produce precisely formed copy, incised to a uniform depth of at least 1/32". A photo-resist (or "graphic" resist) process shall be used. No hand cutting of stencils, templates, etc. will be acceptable in the production of letterforms. Fill incised copy with gloss enamel to match indicated colors.
- G. Silkscreen: All silkscreening to use Nazdar, fast drying enamel silkscreen ink. Ink to be totally opaque and matte color not limited to manufacturer's standard colors. Silkscreen mesh to be 390 or finer.

2.7 DIMENSIONAL CHARACTERS

- A. Aluminum Extrusions: ASTM B221, 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 6063-T5.
- B. Cutout Characters: Cut characters using water jet process from solid plate of thickness and metal indicated. Produce precisely cut characters with square cut, smooth edges. Comply with requirements indicated for finish, style, and size.
 - 1. Metal: Aluminum.
 - 2. Finish: Painted as reviewed by Architect. See G-Series Drawings.
 - 3. Character Height: 14 inches minimum or as indicated on approved shop drawings.
 - 4. Character Style: To be selected.
 - 5. Provide electrical feed for backlit signs.
- C. Water Jet Cutting: Use CNC Water Jet Cutting process and as follows:
 - 1. Use high speed jet of pressurized water with garnet abrasives, of pressure required to achieve clean, accurate, precise cuts of patterns indicated in aluminum of thickness indicated.
 - 2. Maintain flatness of material. Warping due to cutting will be cause for rejection of the panel.
 - 3. Remove any burrs that may remain after cutting is complete, grinding or sanding if necessary to produce a smooth, finished panel.

2.8 ACCESSORIES

- A. Mounting Methods: Use concealed fasteners or silicone adhesive fabricated from materials that are not corrosive to sign material and mounting surface.
- B. Anchors and Inserts: Provide nonferrous-metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion-bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.
- C. Dimensional Character Fasteners:
 - 1. Projecting Studs: Threaded studs with sleeve spacer, welded or brazed to back of sign material, screwed into back of sign assembly, or screwed into tapped lugs cast integrally into back of cast sign material, unless otherwise indicated.

2.9 FINISHING MATERIALS

- A. Polyurethane Coatings: Provide the following, or other products as acceptable to the Architect.
- B. Acrylic Polyurethane Enamel: two-component, acrylic modified, aliphatic polyurethane enamel having UV inhibitors and engineered for application to signage components. Gloss sheen of 90+/- five units at 60 degrees. Flat sheet of 10+/- five units at 60 degrees. Matthews Paint Co. "Series 40 Matthews Acrylic Polyurethane"
- C. Silkscreening Materials: Provide photo processed screening, arranged to furnish sharp and solid images without edge build-up or bleeding of the coating. Pattern-cut screens may be used for non-repeat copy, provided that final image copy is equal to photoscreen quality. Provide only weather-resistant coating materials, compatible with the intended substrates.
- D. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, surface imperfections will not be acceptable.
- E. Transparent (Clear) Finishes: Use multiple coats to produce glass-smooth surface finish or even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections.
- F. Provide satin finish for final coats, unless otherwise indicated.

2.10 FINISHES

- A. Colors and Surface Textures: For exposed sign materials which require selection of materials with integral or applied colors, surface textures of other characteristics related to appearance, provide color matches indicated, or if not otherwise indicated, as selected by Architect from manufacturer's standard.
- B. Metal Finishes: Comply with NAAMM "Metal Finishes Manual" for finish designations and application recommendations. Protect mechanical finishes on exposed surfaces from damage by application of strippable temporary protective covering prior to shipment.
- C. Painted Finishes: Surfaces under painted finish to be smooth, clean and free of dust, grease, fingerprints or other foreign matter. If necessary, to obtain true color application, surface to be "primed" with white before final color is applied. Artwork to be accurately reproduced with all edges straight and true and all finishes smooth and with no visible imperfections.

2.11 FABRICATION OF SIGNS AND SUPPORTS

- A. General: Provide custom manufactured sign assembled components completely fabricated and finished at factory before delivery to site. Construct to accurate detail and dimensions as shown and as reviewed on shop drawings. Fit and assemble the work at shop to the greatest extent possible, and mark the components as required to facilitate assembly during installation.
- B. Exposed Fasteners: Exposed fasteners on finished faces will not be allowed, unless

specifically indicated. When exposed fasteners are used, finish the fastener to match the color and texture of surrounding materials.

- C. Seamless Construction: All sign surfaces and edges to be seamless unless specifically indicated.
- D. Illumination: Provide manufacturers standard lighting provisions using only UL approved electrical components at 120 volts. Provide disconnect switch and make provision for servicing lamps and other components. The minimum brightness ratio between the illuminated letter and the sign face shall be 30 to 1, assuming an ambient lighting level of 10 foot candles. The maximum variation in brightness between any two points on the copy shall be 5 percent. Color of lighting shall be warm white.
- E. Metal Signs and Supports: Fabricate exposed surfaces uniformly flat and smooth, without distortion, pitting or other blemishes. Form exposed metal edges to a smooth radius. Permanently bond the laminated metal components and honeycomb core with adhesive or sealant in accordance with product manufacturer's recommendations. Grind exposed welds and rough areas to make flush with adjacent smooth surfaces.
- F. Welding: Make welds continuous. Comply with American Welding Society, Aluminum Association, and Copper Development Association standards for the type of metal.
- G. Fasteners: Use exposed fasteners only where indicated. Perform drilling and tapping at shop.
- H. Dissimilar Materials: Where metal surfaces will be in contact with dissimilar materials, coat the surfaces with epoxy paint or provide other means of dielectric separation as recommended by manufacturer to prevent galvanic corrosion.

2.12 SHOP APPLICATION OF SIGN FINISHES

- A. Sign Graphics: Provide the letters, numerals, symbols, and other graphic markings, using the finish materials indicated. Apply the graphics neatly, uniformly proportioned and spaced, and accurate within dimensions indicated. Prepare the substrate surfaces and apply finish materials in accordance with manufacturer's instructions.
- B. Polyurethane Finishes: Clean the surfaces as required for proper adhesion of coatings. Use 3M Company "Scotch Brite" pads with cleanser and water, and/or chemically treat as recommended by paint manufacturer to remove deleterious film or residue.
- C. Primer: Provide in strict accordance with paint manufacturer's recommendations as required for proper adhesive and application of finish.
- D. Acrylic Polyurethane Enamel: Apply in 2.0 mils (0.050mm) dry film thickness as recommended by manufacturer. Color and sheen to match Designer's selection.
- E. Clear Matte Finish: Provide pre-treatment, primer, and matte finish coatings in accordance with manufacturer's recommendations. Apply 1.5 to 2.0 mils (0.0375 to 0.050mm) dry film thickness.

- F. Application of Ink and Paints: "Paint" as used herein means all coating systems, materials, including primers, emulsions, enamels, stains, sealers, and fillers.
 - 1. Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied. No paints that will fade, discolor or delaminate as a result of ultraviolet light or heat shall be used.
 - 2. Apply additional coats when undercoats, stains or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance. Give special attention to ensure that surfaces including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
 - 3. Sand lightly between each succeeding enamel or varnish coat.

- G. Scheduling Painting: Apply first-coat material to surfaces that have been cleaned, pre-treated or otherwise prepared for painting as soon as practical after preparation and before subsequent surface deterioration. Allow sufficient time between successive coatings to permit proper drying. Do not re-coat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

2.13 SIGN FINISH SCHEDULE

- H. Colors: See Contact Documents Color Legend or specifications on design drawings.

- I. Digital Artwork: All digital artwork files prepared by the Architect for the Contractor's use shall be in a single layer. Any and all manipulations of the files required for subsequent use by the Contractor, such as spreads and traps for screen negatives, or conversion to outline or EPS, shall be the responsibility of same unless explicitly agreed otherwise by the Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Installer must examine areas, surfaces and conditions under which the work is to be installed. Notify the Architect in writing of conditions detrimental to the proper and timely completion of the work; i.e. existing mechanical, electrical or plumbing elements, or any visual or physical conflicts. Starting work implies acceptable surfaces and conditions.

- B. Verification of Sign Locations: Installer must visit site to review exact placement of all signs, with Contractor or designated representative.

3.2 INSTALLATION, EXTERIOR SIGNAGE - GENERAL

- A. General: Complete installation shall be in accordance with manufacturer's printed instructions and accepted shop drawings, to produce Work complying with the Contract Documents.

- B. Locate signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions.

- C. Erection of Signs: Set and attach the Work accurately in location where shown on schedule

of signs and/or sign location plans, attaching signs to substrates in accordance with manufacturer's instructions unless otherwise indicated. Alignment and elevation plumb, level and true, as measured from established reference points; except beams which are not level. Signs attached to the face of a beam should be aligned with the bottom of the beam, to ensure that the sign(s) will be in visual alignment. Penetration of attachment anchors into any structural element shall be coordinated with Architect to prevent structural damage. Fit components accurately together to form tight joints and secure connections. Where free standing signs are mounted on concrete bases, installer is to drill in expansive anchor bolts with sufficient bearing and uplift capacity to meet the design wind requirements. Letters and signs shall be structurally designed as required to resist 30 psf wind loads and thermal movements without distortions or excessive deflections.

- D. Dimensional Characters: Mount characters using standard fastening methods recommended in writing by manufacturer for character form, type of mounting, wall construction, and condition of exposure indicated. Provide heavy paper template to establish character spacing and to locate holes for fasteners.
 - 1. Projected Mounting: Mount characters at projection distance from wall surface indicated.
- E. Coordination: The Contractor shall fully coordinate his work with and cooperate with the General Contractor and his subcontractors as to schedule and location of the Work.

3.3 INSTALLATION, INTERIOR SIGNAGE - GENERAL

- A. Install signs level, plumb, and at heights indicated, with sign surfaces free from distortion and other defects in appearance.
- B. Interior Wall Signs: Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches (75 mm) of sign without encountering protruding objects or standing within swing of door.
- C. Install sign items, including all components, in accordance with reviewed Graphic Schedule at locations shown.
- D. Install with reviewed manufacturer's adhesive or mechanical fasteners after application of finish painting at heights noted.

3.4 INSTALLATION OF PANEL SIGNS

- A. Wall mounted Units: Attach panel sign to wall surfaces using methods indicated below.
- B. Silicone Adhesive Mounting: Use standard liquid silicone adhesive with a methanol cure recommended by sign manufacturer to attach sign units to irregular, brick, porous or vinyl-covered surfaces. Use standard liquid silicone adhesive with an acetic acid cure recommended by sign manufacturer to attach sign units to smooth, painted or glass surfaces. Use double-sided VHB tape where recommended by sign manufacturer to hold sign in place until adhesive has fully cured. This method to be used for units mounted on barricades also.
- C. Pin Mounting: A minimum of four threaded studs. Studs shall be minimum 3/16" round by 1" long or longer as required by wall substrate. Pins shall be of adequate length to securely

fasten to wood or metal backing. Pin mounting to foam materials is not permitted. Pins will be welded to back with no distortions or discoloration to sign face. Use epoxy adhesive where required and temporarily support signs with foam tape or other mechanical means that does not damage surrounding surfaces, until adhesive has cured.

- D. Mechanical Mounting: Securely attach signs to the supporting structure with permanent, concealed vandal resistant fasteners in accordance with manufacturer's installation instructions.
- E. VHB-Tape Mounting: Use double-sided VHB tape, of thickness indicated to mount signs to smooth non-porous surfaces. Do not use for vinyl-covered or rough surfaces.
- F. Cleat Mounting: Provide concealed cleats of thickness indicated on detail drawings, with pre-drilled and countersunk holes, at locations indicated and where other mounting methods are not practical. Attach cleats with fasteners and anchors suitable for secure attachment to substrate. Attach panel sign units to cleats by method specified above for application to smooth surfaces, and shown in detail drawings.
- G. Concrete Footing: Provide reinforced concrete footings where required, with plan dimensions as shown and depth as specified by Engineer. Use sonotube type formwork for post and panel signs at all landscape locations; core drill and set post(s) in epoxy grout at all hardscape locations.
- H. Exterior wall mounting: Seal any wall penetration with caulking. Follow exterior wall manufacturing guidelines for sealing penetrations.
- I. Magnetic Tape Mounting: For panel sign inserts provide maximum 1/16" thick flexible magnetic sheet with adhesive and flexible receiver strip with adhesive.
- J. Suspended Units: Use manufacturer's standard brackets, fittings and hardware for mounting signs which project at right angles from walls and ceilings. Attach brackets and fittings securely to ceilings or walls per Contractor approved engineered submittal using fasteners and anchoring devices and that comply with manufacturer's directions. Engineer and install supports above finished ceilings, coordinate with General Contractor, lighting, fire sprinklers, mechanical and communication equipment in vicinity of sign.

3.5 APPLICATION OF VINYL GRAPHICS

- A. Preparation: Surfaces to receive vinyl graphics shall be clean, dry, and otherwise made ready for application of graphics. Accurately measure and lay out the required marking configurations as indicated on drawings.
- B. Vinyl, Die-Cut and Pattern-Cut: Apply in strict accordance with manufacturer's instructions. Make uniformly smooth and free from bubbles, wrinkles, stretching or other blemishes.

3.6 CUTTING AND PATCHING

- A. The Contractor will furnish all labor, implements, tools, scaffolding, rigging, hoisting and other items required to carry out the work, in the most approved and up-to-date safe and sound

manner, all to the highest quality standard; and shall do the necessary incidental cutting of woodwork, brick, stone, masonry, plaster, cement, iron, metal or any other material for the installation of the work, and will do all patching in connection therewith; but cutting is to be avoided where possible. The Contractor shall do all necessary cutting, fitting and patching of its own work that may be required to make the several parts come together properly, and fit the work to receive or be received by work of other contractors, or reasonably implied by the drawings and specifications. The Contractor shall not endanger any work by cutting, digging or otherwise. The Contractor shall be responsible for all cutting of its work. In case sleeves or hangers are not replaced in time, or are improperly placed, the Contractor shall be responsible for forming or drilling openings in the work where required and for any patching or corrective work necessary.

- B. All cutting shall be done promptly and all repairs shall be made as necessary to leave the entire work in good condition, including all cutting, fitting and drilling of masonry, concrete, metal, wood, plaster, and other materials as specified or required for proper assembly, fabrication, installation and completion of all work under the Contract, and including any patching as may be necessary. Structural members shall not be cut except by written authority of the Architect. Work done contrary to such authority is at the Contractor's risk and subject to replacement at his own expense.
- C. Permission to patch any areas or items of work shall not constitute a waiver of the Architect's right to require complete removal and replacement of said areas or items of work, if, in the Architect's opinion, said patching does not satisfactorily restore quality and appearance of same.

3.7 ADJUSTING

- A. Neatly repair minor blemishes or marring on finished surfaces so that repairs are imperceptible. Completely replace components having permanent non-removable scratches, stains, bubbles or other defacement.

3.8 CLEANING

- A. Construction Waste Management: Manage construction waste in accordance with provisions of Section 01 7419 Construction Waste Management and Disposal. Submit documentation for Credit MRp2/MRc5 to satisfy the requirements of that Section.
- B. Upon completion of the Work, remove unused materials, debris, containers and equipment from the project site. Remove protective coverings and clean the exposed surfaces of the Work to remove the dirt, stains, and other substances, by methods as recommended by manufacturer.

3.9 PROTECTION

- A. Protect the Work during the construction period so that it will be without any indication or use of damage. Leave the Work clean and free from defects at time of Owner's acceptance.

END OF SECTION

SECTION 10 14 19
DIMENSIONAL LETTERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes: Digitally (precision) cut exterior letters of composition.

1.3 ACTION SUBMITTALS

- A. Product Data: Submit product data for specified products. Include material details for each sign specified.
- B. Shop Drawings: Submit shop drawings showing layout, profiles, and product components, including dimensions, anchorage, and accessories.
- C. Samples: Submit supplier's standard color chart for selection purposes and selected colors for verification purposes.
- D. Installation: Submit supplier's installation instructions.
- E. Closeout Submittals per Division 01.
- F. Submit operation and maintenance data for installed products, including precautions against harmful cleaning materials and methods.
- G. Submit warranty documents specified herein.

1.4 QUALITY ASSURANCE

- A. Supplier: Obtain all products in this section from a single supplier.
- B. Regulatory Requirements: Products shall meet requirements of the Americans With Disabilities Act Accessibility Guidelines (ADAAG) and local amendments and modifications.
- C. Installer: Installation shall be performed by installer specialized and experienced in work similar to that required for this project.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Comply with requirements of Division 01.
 - 1. Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
 - 2. Deliver products in manufacturer's original, unopened, undamaged containers with identification labels intact.
 - 3. Store products protected from weather, temperature, and other harmful conditions as recommended by supplier.
 - 4. Handle products in accordance with manufacturer's instructions.

1.6 WARRANTY

- A. Project Warranty: Comply with requirements of Division 01.
- B. Manufacturer's Warranty: Submit manufacturer's standard warranty document executed by authorized company official.
 - 1. Warranty Period: One year from product ship date. Warranty specifically excludes letter mounting substrate.

PART 2 – PRODUCTS

2.1 SIGNAGE SYSTEMS

- A. Acceptable Sign Fabricators
 - 1. Weidner Architectural Signage; Sacramento, CA (916) 452-8000. Attn: Rick Weidner.
 - 2. Martinelli Environmental Graphics; San Francisco, CA (415) 621-1559. Attn: Keith Crossman.
 - 3. Ellis & Ellis Sign Systems; Sacramento, CA (916) 924-1936. Attn: Eric Borges.
 - 4. The proposed substitution of other sign fabricators for those listed above may be considered by the Architect if said sign fabricator(s):
 - a. Demonstrates that his/her applicable product(s) are equal in salient characteristics such as construction, quality, durability, appearance and warranty to those of the acceptable sign fabricators listed.
 - b. Demonstrates that the key personnel to be assigned to the project have a consistent history of thorough quality control, adherence to schedule and promptness of communication equal to those of the acceptable sign fabricators listed. Said key personnel shall include the project manager, the shop supervisor, the art department supervisor and the lead installer.
 - c. Supplies three positive references from reputable environmental graphic design consultants for comparable work.

2.2 PRECISION-CUT LETTERS

- A. Aluminum:
 - 1. Extruded Shapes: Provide alloy 6063; size as required, or as specified by Engineer.
 - 2. Flat Sheet: Provide alloy 3003; mil finish as specified, for all Work which will receive a painted finish.
- B. Cut Letters:
 - 1. Letterstyle: Frutiger 55 Roman.
 - 2. Letter Height: As indicated on drawings, lower and upper case.
 - 3. Acrylic Colors: as selected by Architect.

4. Metal Laminate Finish: Brush.

C. Mounting Method: Stainless Steel spacer sleeve or stand-off.

2.3 FABRICATION - GENERAL

A. General: Comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.

B. Design, fabricate, and install sign assemblies to prevent buckling, opening up of joints, and over-stressing of welds and fasteners.

C. Mill joints to a tight, hairline fit. Form joints exposed to the weather to exclude water penetration.

D. Create signage to required sizes and layout. Comply with requirements indicated for design, dimensions, finish, color, and details of construction.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Site Verification of Conditions: Verify installation conditions previously established under other sections are acceptable for product installation in accordance with manufacturer's instructions.

B. Scheduling of installation by Owner or its representative implies that substrate and conditions are prepared and ready for product installation. Proceeding with installation implies installer's acceptance of substrate and conditions.

3.2 INSTALLATION

A. Install product in accordance with supplier's instructions.

B. Install product in locations indicated using mounting methods specified [recommended by sign manufacturer] and free from distortion, warp, or defect adversely affecting appearance.

C. Install product level, plumb, and at heights indicated per mounting specified.

D. Install product at heights to conform to Americans with Disabilities Act Accessibility Guidelines (ADAAG) and applicable local amendments and regulations.

E. Install signs within the following tolerances and in accordance with manufacturer's recommendations.

F. Exterior Signs: Within 1 inch vertically and horizontally of intended location

3.3 CLEANING, PROTECTION, AND REPAIR

- A. Repair scratches and other damage which might have occurred during installation. Replace components where repairs were made but are still visible to the unaided eye from a distance of 10 feet.
- B. Remove temporary coverings and protection to adjacent work areas. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove construction debris from project in accordance with provisions in Division 01.

3.4 SIGN SCHEDULE

- A. Schedule: Refer to Drawings for sizes, locations, and layout of signage types, sign text copy, and graphics.

END OF SECTION

SECTION 10 21 13

TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes solid-plastic toilet compartments configured as toilet enclosures and urinal screens.
- B. Related Requirements:
 - 1. Section 06 10 00 "Rough Carpentry" for blocking.
 - 2. Section 10 28 13 "Toilet Accessories" for toilet tissue dispensers, grab bars, purse shelves, and similar accessories mounted on toilet compartments.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for toilet compartments.
- B. Shop Drawings: For toilet compartments.
 - 1. Include plans, elevations, sections, details, and attachment details.
 - 2. Show locations of cutouts for compartment-mounted toilet accessories.
 - 3. Show locations of reinforcements for compartment-mounted grab bars and locations of blocking for surface-mounted toilet accessories.
 - 4. Show locations of centerlines of toilet fixtures.
 - 5. Show locations of floor drains.
- C. Samples for Initial Selection: For each type of toilet compartment material indicated.
 - 1. Include Samples of hardware and accessories involving material and color selection.
- D. Samples for Verification: For the following products, in manufacturer's standard sizes unless otherwise indicated:
 - 1. Each type of material, color, and finish required for toilet compartments, prepared on 6-inch-square Samples of same thickness and material indicated for Work.
 - 2. Each type of hardware and accessory.
- E. Product Schedule: For toilet compartments, prepared by or under the supervision of supplier, detailing location, and selected colors for toilet compartment material.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of toilet compartment.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For toilet compartments to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Door Hinges: One hinge(s) with associated fasteners.
 - 2. Latch and Keeper: One latch(es) and keeper(s) with associated fasteners.
 - 3. Door Bumper: One door bumper(s) with associated fasteners.
 - 4. Door Pull: One door pull(s) with associated fasteners.
 - 5. Fasteners: Ten fasteners of each size and type.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 450 or less.
- B. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and CBC for toilet compartments designated as accessible.
 - 1. Door width to accessible compartments shall comply with 11B-604.3.1.
 - 2. Provide toe clearance as required by CBC 11B-604.8.1.4.
 - 3. Hardware on accessible compartment doors:
 - a. Provide pulls on both sides of doors.
 - b. Provide an accessible latch.
 - c. Mount hardware as indicated on drawings but must be between 34-inches to 44-inches above finish floor.

2.2 MANUFACTURERS

- A. Plastic Toilet Compartments:
1. Bobrick Washroom Equipment Inc.; Product 1092.67 Sierra Series as represented by R. E. Edwards (925) 829-2942.
 2. Toilet Partitions shall be the product of a single manufacturer.
 3. Substitutions: Section 01 60 00 - Product Requirements.
- C. Solid Color Reinforced Composite (SCRC) Toilet Partitions: Bobrick SierraSeries.
1. Design Type:
 - a. Standard Height.
 - 1) Door/Panel Height: 58 inches (147 cm).
 - 2) Floor Clearance: 12 inches (30 cm).
 - b. Maximum Height.
 - 1) Door/Panel Height: 71-3/4 inches (182 cm).
 - 2) Floor Clearance: 4-1/2" inches (11 cm).
 2. Privacy Style Partitions: No sightlines with gap-free interlocking doors and stiles routed 0.300 inches (7.6 mm) from the edge to allow for 0.175 inch (4.4 mm) overlap to prevent line-of-sight into the toilet compartment. Privacy strips fastened or adhered onto the partition material are not acceptable.
 3. Mounting:
 - a. Floor-mounted, overhead-braced with extruded anodized aluminum headrails, 0.065 inch (1.65 mm) thick with anti-grip profile.
 - 1) Stile Maximum Height: 83 inches (211 cm).
- D. Solid Color Reinforced Composite (SCRC) Urinal Screens: Bobrick SierraSeries.
1. Mounting Configuration:
 - a. Floor-anchored standard height: Screen Standard Height:
 - 1) 58 inches (178 cm) with floor clearance: 12 inches (30 cm)
 - 2) Stile Standard Height: 69 inches (175 cm)
- E. Materials: Solid color reinforced composite (SCRC) material for stiles, panels, doors, and screens with Bobrick GraffitiOff coating, thermoset and integrally fused into homogenous piece; high density polyethylene (HDPE), high density polypropylene not acceptable.
1. Composition: Dyes, organic fibrous material, and polycarbonate/phenolic resins.
 2. Surface Treatment: Non-ghosting, graffiti resistant surface integrally bonded to core through a manufacturing steps requiring thermal and mechanical pressure.
 3. Edges: Same color as the surface.
Color:
 - 1) Selected from standard options.
- F. Finished Thickness:
1. Stiles and Doors: 3/4 inch (19 mm).
 2. Panels and Screens: 1/2 inch (13 mm).

- G. Stiles: Floor-anchored stiles furnished with expansion shields and threaded rods.
1. Leveling Devices: 7 gauge, 3/16 inches (5 mm) thick, corrosion-resistant, chromate-treated, double zinc-plated steel angle leveling bar bolted to stile; furnished with 3/8 inch (10 mm) diameter threaded rods, hex nuts, lock washers, flat washers, spacer sleeves, expansion anchors, and shoe retainers.
 2. Stile Shoes: One-piece, 22 gauge (0.8 mm), 18-8, Type 304 stainless steel, 4 inch (102 mm) height; tops with 90 degree return to stile. One-piece shoe capable of adapting to 3/4 inch (19 mm) or 1 inch (25 mm) stile thickness and capable of being fastened (by clip) to stiles starting at wall line.
- H. Wall Posts: Pre-drilled for door hardware, 18-8, Type 304, 16 gauge (1.6 mm) stainless steel with satin finish; 1 inch (25 mm) x 1-1/2 inches (38 mm) x 58 inches high (1473 mm).
- I. Anchors: Expansion shields and threaded rods at floor connections as applicable. Threaded rods secured to supports above ceiling as applicable. Supports above ceiling furnished and installed as Work of Section 05 50 00 - Metal Fabrications.
- J. Hardware: Chrome-plated "Zamak", aluminum, extruded plastic hardware not acceptable.
1. Compliance: Operating force of less than 5 lbs. (2.25 kg).
 2. Emergency Access: Hinges, door latch allow door to be lifted over keeper from outside compartment on inswing doors.
 3. Materials: 18-8, Type 304, heavy-gauge stainless steel with satin finish.
 4. Doorstops: Prevents inswinging doors from swinging out beyond stile; on outswing doors, doorstop prevents door from swinging in beyond stile.
 5. Fastening: Hardware secured to door and stile by through-bolted, theft-resistant, pin-in-head Torx stainless steel machine screws into factory-installed, threaded brass inserts. Fasteners secured directly into core not acceptable.
 - a. Threaded Brass Inserts: Factory-installed; withstand direct pull force exceeding 1500 lbs. (680 kg) per insert.
 6. Clothes Hooks: Projecting no more than 1-1/8 inch (29 mm) from face of door.
 7. Door Latch: Track of door latch prevents inswing doors from swinging out beyond stile; on outswing doors, door keeper prevents door from swinging in beyond stile; 16-gauge (1.6 mm) sliding door latch, 14-gauge (2 mm) keeper. Latch shall allow operation of turn bolt from both sides of door and shall comply with CBC 11B-309.
 8. Locking: Door locked from inside by sliding door latch into keeper.
 9. Hinge Type:
 - a. Full-Height Institutional Hinge.
 - b. Hinges: 16 gauge (1.6 mm) stainless steel, self-closing, 3 section hinges.
 10. Mounting Brackets:
 - a. Full-Height.
 - 1) Angle Brackets: Secure stiles-to-walls and panels to walls.
- J. Fasteners:
1. Theft-resistant (one-way) fasteners for fastening exposed hardware, component connections and compartments to walls.
 2. Finish fasteners to match the hardware and fittings.

22 FABRICATION

- A. Provide profiles and dimensions indicated. Fabricate components straight, clean cut and free from defective workmanship and materials.
- B. Furnish units with factory cut-outs, drilled holes, and internal reinforcement to receive partition-mounted hardware, accessories, and grab bars, as indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for fastening, support, alignment, operating clearances, and other conditions affecting performance of the Work.
 - 1. Confirm location and adequacy of blocking and supports required for installation.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.
 - 1. Maximum Clearances:
 - a. Pilasters and walls: One-inch.
 - b. Panels and walls: One-inch.
 - c. Pilasters and panels: 1/2-inch.
 - d. Pilasters and doors: 3/16-inch.
 - 2. Stirrup Brackets: Secure panels to walls and to pilasters with no fewer than two brackets attached near top and bottom of panel.
 - a. Locate wall brackets so holes for wall anchors occur in masonry or tile joints.
 - b. Align brackets at pilasters with brackets at walls.
 - 3. Full-Height (Continuous) Brackets: Secure panels to walls and to pilasters with full-height brackets.
 - a. Locate bracket fasteners so holes for wall anchors occur in masonry or tile joints.
 - b. Align brackets at pilasters with brackets at walls.
- B. Floor-and-Ceiling-Anchored Units: Secure pilasters to supporting construction and level, plumb, and tighten. Hang doors and adjust so doors are level and aligned with panels when doors are in closed position.

- C. Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb, rigid, and secured to resist lateral impact.
- D. Provide solid spacers to prevent crushing ceiling material where compartment stiles meet ceiling.
 - 1. Secure pilasters to their supports. Level, plumb, and tighten installation with devices furnished. Cover with stainless steel trim with a tight, flush fit.
 - 2. Hang doors and adjust so that bottom of doors are level with bottom of pilasters when doors are closed.
- E. Secure panels to walls with not less than 2 stirrup brackets attached near top and bottom of panel.
 - 1. Locate wall brackets so that holes for wall anchorages occur in tile joints.
 - 2. Secure panels to pilasters with not less than 2 stirrup brackets located to align with stirrup brackets at wall.
 - 3. Anchor panels to studs or backing plates; fastening components to walls with toggle bolts will not be allowed.
- F. Install hardware as recommended by manufacturer. Conceal evidence of drilling in finished work.

3.3 ADJUSTING/CLEANING

- A. Adjust brackets and hardware to provide uniform clearances not exceeding the following dimensions:
 - 1. Pilasters and walls: One-inch.
 - 2. Panels and walls: One-inch.
 - 3. Pilasters and panels: 1/2-inch.
 - 4. Pilasters and doors: 3/16-inch.
- B. Adjust hardware for proper operation. Set hinges on in-swinging doors to hold open approximately 30-degree from closed position when unlatched, except set hinges on out- swinging doors and accessible compartments to return to fully closed position.
- C. After completion of installation, clean and polish exposed surfaces and touchup minor scratches.
- D. Remove and replace components which cannot be satisfactorily touched-up in the field, in the Architect's opinion.

END OF SECTION

SECTION 10 26 00
WALL PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Corner guards.
 - 2. Abuse-resistant wall coverings.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, impact strength, dimensions of individual components and profiles, and finishes.
 - 2. Include fire ratings of units recessed in fire-rated walls and listings for door-protection items attached to fire-rated doors.
- B. Shop Drawings: For each type of wall protection showing locations and extent.
 - 1. Include plans, elevations, sections, and attachment details.
- C. Samples for Verification: For each type of impact-resistant wall-protection unit indicated, in each color and texture specified, including accent strips and accessories to verify color selection. For each type of exposed finish on the following products, prepared on Samples of size indicated below:
 - 1. Corner Guards: 12 inches long. Include example top caps.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of handrail.
- B. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of wall and door protection product to include in maintenance manuals.
 - 1. Include recommended methods and frequency of maintenance for maintaining best condition of metal covers under anticipated traffic and use conditions. Include precautions against using cleaning materials and methods that may be detrimental to finishes and performance.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Corner-Guard Covers: Full-size metal covers of maximum length equal to 2.
 - 2. Mounting and Accessory Components: Amounts proportional to the quantities of extra materials. Package mounting and accessory components with each extra material.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store wall and door protection in original undamaged packages and containers inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.
 - 1. Maintain room temperature within storage area at not less than 70 deg F during the period metal materials are stored.
 - 2. Keep metal materials out of direct sunlight.
 - 3. Store metal wall- and door-protection components for a minimum of 72 hours, or until metal material attains a minimum room temperature of 70 deg F.
 - 4. Store corner-guard covers in a vertical position.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of wall- and door-protection units that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including detachment of components from each other or from the substrates, delamination, and permanent deformation beyond normal use.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal use.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Provide components identical to those tested in accordance with ASTM E84 for fire performance characteristics indicated. Identify components with appropriate markings from the testing organization.
 - 1. Flame Spread: 25 or less.
 - 2. Smoke Developed: 450 or less. 3. Impact Strength: Provide components with minimum impact resistance of 25.4 ft. lbs per sq. ft. when tested in accordance with ASTM D256 (Izod impact, ft. lbs per inch notch).
- B. Colors and Textures of Plastic Material: Provide material that matches selections made from the manufacturer's full range of standard colors and textures.
- C. Aluminum Extrusions: Alloy and temper recommended for use and finish indicated, but with not less than strength and durability properties in ASTM B221 for 6063-T5. D. Stainless Steel: Type 304.
 - 1. Thickness: Minimum 0.0625 inch (1.6 mm).

2. Finish: Directional satin, No. 4.

D. Stainless Steel: Type 304.

1. Thickness: Minimum 0.0625 inch (1.6 mm).
2. Finish: Directional satin, No. 4.

E. Adhesive: Construction grade adhesive supplied by manufacturer. 1. VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

F. Fasteners: Aluminum, nonmagnetic stainless steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with components, hardware, anchors, and other items being fastened. Use theft-proof fasteners where exposed to view.

2.2 CORNER GUARDS

A. Basis-of-Design: Life Science Products, Inc. or equal.

1. Model: CG-1M; 16-gauge stainless steel by full height, with 1-1/2-inch legs, 1/8- inch radiused corner, and countersunk holes for fasteners. Ease exposed edges.
2. Location: Where shown on Drawings.

B. Basis-of-Design: Construction Specialties, Inc. or equal.

1. Model: CO-8 90° stainless steel corner guard with 3/16" radius and 3 1/2" standard legs. Mounted with construction adhesive standard and countersunk stainless steel screws, from top of base to ceiling.
2. Location: Where shown on Drawings.

2.3 ABUSE-RESISTANT WALL PROTECTION

A. Abuse-Resistant Sheet Metal Wall Covering: Fabricated from semirigid, sheet metal wall-covering material.

1. Material: Stainless-steel sheet, Type 304.
2. Size: 48 by 96 inches for sheet.
3. Sheet Thickness: 16-gauge minimum.
4. Finish: Type 304, No. 4 satin.
5. Trim and Joint Moldings: To match wall protection material.
6. Mounting: Adhesive or mechanically fastened.

2.4 MATERIALS

A. Stainless-steel sheet: ASTM A 240/A 240M.

B. Fasteners: Aluminum, nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Use security-type fasteners where exposed to view.

- C. Adhesive: Type recommended by manufacturer for use with material being adhered to substrate indicated. Use adhesives and sealants complying with limits for VOC content prescribed by authorities having jurisdiction.
- D. Impact Cushions: Extruded thermoplastic, 70 durometer Shore A

2.5 FABRICATION

- A. Fabricate wall-protection units to comply with requirements indicated for design, dimensions, and member sizes, including thicknesses of components.
- B. Factory-assemble components to greatest extent possible to minimize field assembly. Disassemble only as necessary for shipping and handling.
- C. Fabricate components with tight, flush seams and joints with exposed edges rolled.
- D. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.

2.6 METAL FINISHES

- A. Comply with NAAMM "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
 - 1. Remove tool and die marks and stretch lines or blend into finish.
 - 2. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.
 - 3. Finish exposed stainless steel surfaces with a NAAMM No. 4, stain finish with grain parallel to length of component.
- B. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
- C. Protect finished exposed surfaces from damage with a strippable, temporary protective covering before shipping.
- D. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances, fire rating, and other conditions affecting performance of the Work.
- B. Examine walls to which wall and door protection will be attached for blocking, grounds, and other solid backing that have been installed in the locations required for secure attachment of support fasteners.
 - 1. For wall and door protection attached with adhesive, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Complete finishing operations, including painting, before installing wall and door protection.
- B. Before installation, clean substrate to remove dust, debris, and loose particles.

3.3 INSTALLATION

- A. Installation Quality: Install wall and door protection according to manufacturer's written instructions, level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.
- B. Mounting Heights: Install protection in locations and at mounting heights indicated on Drawings
- C. Accessories: Provide splices, mounting hardware, anchors, trim, joint moldings, and other accessories required for a complete installation.
 - 1. Provide anchoring devices and suitable locations to withstand imposed loads.
 - 2. Where splices occur in horizontal runs of more than 20 feet, splice aluminum retainers and metal covers at different locations along the run, but no closer than 12 inches apart.
 - 3. Adjust end and top caps as required to ensure tight seams.
- D. Abuse-Resistant Wall Covering: Install top and edge moldings, corners, and divider bars as required for a complete installation.

3.4 CLEANING

- A. Immediately after completion of installation, clean metal covers and accessories using a standard ammonia-based household cleaning agent.
- B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION

SECTION 10 28 13
TOILET ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Public-use washroom accessories.
 - 2. Custodial accessories.
- B. Related Requirements:
 - 1. Section 09 30 00 "Tiling" for ceramic toilet and bath accessories.

1.3 COORDINATION

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.
- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 - 2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
 - 3. Include electrical characteristics.
- B. Samples: For each exposed product and for each finish specified, full size.
 - 1. Approved full-size Samples will be returned and may be used in the Work.
- C. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

1. Identify locations using room designations indicated.
2. Identify accessories using designations indicated.
3. Include structural design calculations indicating compliance with specified structural-performance requirements.

1.5 INFORMATIONAL SUBMITTALS

- A. Sample Warranty: For manufacturer's special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For accessories to include in maintenance manuals.

1.7 WARRANTY

- A. Manufacturer's Special Warranty for Mirrors: Manufacturer agrees to repair or replace mirrors that fail in materials or workmanship within specified warranty period.
 1. Failures include, but are not limited to, visible silver spoilage defects.
 2. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products listed are made by Bobrick except for the flexible shower spray hose by Moen.
- B. Other Acceptable Manufacturers:
 1. American Specialties, Inc: www.americanspecialties.com.
 2. Bradley Corporation: www.bradleycorp.com.
 3. Substitutions: Section 01 60 00 - Product Options and Substitutions.
- C. All items of each type to be made by the same manufacturer.

2.2 MATERIALS

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
 1. Grind welded joints smooth.
 2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.
- B. Keys: Provide 4 keys for each accessory to Owner; master key all lockable accessories.
- C. Stainless Steel Sheet: ASTM A 666, Type 304.
- D. Stainless Steel Tubing: ASTM A 269, Type 304 or 316.

- E. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A 653/A 653M, with G90/Z275 coating.
- F. Mirror Glass: Float glass, ASTM C 1036 Type I, Class 1, Quality Q2, with silvering, copper coating, and suitable protective organic coating to copper backing in accordance with GSA CID A-A-3002.
- G. Adhesive: Two component epoxy type, waterproof.
- H. Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof, security type.
- I. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.3 FINISHES

- A. Stainless Steel: No. 4 satin brushed finish, unless otherwise noted.
- B. Back paint components where contact is made with building finishes to prevent electrolysis.

2.4 TOILET ROOM ACCESSORIES

- A. See interior elevations and toilet room plans for accessories.
- B. Partition-mounted Combination Seat-Cover Dispenser, Sanitary Napkin Disposal and Toilet Tissue Dispenser: Stainless Steel recessed with door.
 - 1. Product: B-357 manufactured by Bobrick.
- C. Recessed Combination Seat-Cover Dispenser, Waste Disposal, and Toilet Tissue Dispenser: Stainless Steel and high-impact plastic.
 - 1. Product: B-3092 manufactured by Bobrick.
- D. Soap Dispenser: Liquid, lavatory mounted. Provided by District, installed by this contract.
 - 1. Product: B-822 manufactured by Bobrick.
- E. Mirrors: Stainless steel framed, 6 mm thick float glass mirror.
 - 1. Size: Per Architect's drawings
 - 2. Frame: 0.05-inch angle shapes, with mitered and welded and ground corners, and tamperproof hanging system; No.4 finish.
 - 3. Backing: Full-mirror sized, minimum 0.03-inch galvanized steel sheet and non-absorptive filler material.
 - 4. Product: B-165 manufactured by Bobrick.
- F. Mirrors: Stainless steel framed, 6 mm thick float glass mirror.
 - 1. Size: 18 x 30.
 - 2. Frame: 0.05-inch angle shapes, with mitered and welded and ground corners, and tamperproof hanging system; No.4 finish.
 - 3. Backing: Full-mirror sized, minimum 0.03-inch galvanized steel sheet and non-absorptive filler material.
 - 4. Shelf: Stainless steel; gage and finish to match mirror frame, turned down edges, welded to frame; 5 inches deep, full width of mirror.
 - 5. Product: B-166 manufactured by Bobrick.
- G. Grab Bars: Stainless steel, 1-1/4 inches outside diameter, minimum 0.05-inch wall thickness, nonslip grasping surface finish, concealed flange mounting; 1-1/2 inches clearance between wall and inside of grab bar.

1. Length and configuration: As indicated on drawings.
 2. Product: B5806 series, 36 and 42 inches long manufactured by Bobrick.
- H. Recessed Convertible Paper Towel Dispenser and Waste Receptacle: Stainless steel, recessed.
1. Product: B-3944 manufactured by Bobrick.
- I. Clothes Hook: Cast aluminum.
1. Product: B-212 manufactured by Bobrick.

2.5 SHOWER AND TUB ACCESSORIES

- A. Shower Curtain Rod: Stainless steel tube, 1 inch outside diameter, 0.04-inch wall thickness, satin-finished, with 3 inches outside diameter, minimum 0.04-inch-thick satin-finished stainless-steel flanges, for installation with exposed fasteners.
1. Product: B-207 manufactured by Bobrick.
- B. Shower Curtain: Opaque vinyl, 0.008-inch thick, matte finish, with antibacterial treatment, flameproof and stain-resistant.
1. Size: 70 x 72 inches, hemmed edges.
 2. Grommets: nickel-plated brass; pierced through top hem on 6-inch centers.
 3. Color: White.
 4. Shower curtain hooks: Chrome-plated or stainless-steel spring wire designed for snap closure.
 5. Product: 204-3 & 204-1 manufactured by Bobrick.
- C. Shower Compartment Grab Bars: Stainless steel, 1-1/4 inches outside diameter, minimum 0.05-inch wall thickness, nonslip grasping surface finish, concealed flange mounting; 1-1/2 inches clearance between wall and inside of grab bar.
1. Length and configuration: As indicated on drawings.
 2. Product: B-58616 manufactured by Bobrick.
- D. Folding Shower Seat: Wall-mounted recessed; welded tubular seat frame, structural support members, hinges and mechanical fasteners of Type 304 stainless steel, L-shaped, right-hand seat.
1. Product: B-5181 manufactured by Bobrick.
- E. Wall-Mounted Soap Dish: Heavy duty, seamless stainless steel, recessed, without grab bar, satin finish; with concealed mechanical fastening suitable for substrate and backplate.
1. Product: B-4380 manufactured by Bobrick.
- F. Towel Bar: Stainless steel Type 304, 3/4-inch square tubular bar; rectangular brackets, concealed attachment, satin finish.
- G. Robe Hook: Heavy-duty stainless steel, single-prong, rectangular-shaped bracket and backplate for concealed attachment, satin finish.
1. Product: B-76717 manufactured by Bobrick.
- H. Flexible Shower Spray Hose, spiral hose, 2.5 GPM hand spray with 59" stainless steel hose and pause control, 24" wall-mounted slide bar with hand spray holder. Pressure balancing valve cartridge, inline atmospheric vacuum breaker.
1. Product: Chicago Faucets, Model: SH-PB1-00-011.

- I. Grab Bars: Stainless steel, 1-1/4 inches outside diameter, minimum 0.05-inch wall thickness, nonslip grasping surface finish, concealed flange mounting; 1-1/2 inches clearance between wall and inside of grab bar.
 1. Length and configuration: As indicated on drawings.
 2. Product: B-5806 manufactured by Bobrick.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
 1. Remove temporary labels and protective coatings.
- B. Grab Bars: Install to comply with specified structural-performance requirements.

3.2 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Clean and polish exposed surfaces according to manufacturer's written instructions.

END OF SECTION

SECTION 10 44 00
FIRE EXTINGUISHERS AND CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
1. Portable, hand-carried fire extinguishers and mounting brackets for fire extinguishers.
 2. Fire-protection cabinets for the following:
 - a. Portable fire extinguisher.
 - b. Portable fire extinguisher and fire-hose valve.
 - c. Portable fire extinguisher, fire hose, rack, and fire-hose valve.
 - d. Fire-hose valve.
 - e. Fire hose, rack, and fire-hose valve.
- B. Related Requirements:
1. Section 07 84 43 "Joint Firestopping".

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
1. Review methods and procedures related to fire extinguishers including, but not limited to, the following:
 - a. Schedules and coordination requirements.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher cabinets.
 2. Show door hardware, cabinet type, trim style, and panel style. Include roughing-in dimensions and details showing recessed-, semi-recessed-, or surface mounting method and relationships of box and trim to surrounding construction.
 3. Include rated capacities, and furnished specialties and accessories.
 4. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher and mounting brackets.
 5. Show location of knockouts for hose valves.

6. Submit manufacturer's literature and installation instructions for each material and accessory, clearly notating specified requirements.
 - B. Shop Drawings: For fire-protection cabinets, plans, elevations, sections, details, and attachments to other work. Submit shop drawings for the fabrication and installation of the Work. Prepare details at not less than 3 in. = 1 ft. scale.
 1. Include plans, elevations, sections, and mounting details.
 - C. Samples for Verification: For each type of exposed finish required, prepared on samples 6 by 6 inches square.
 - D. Product Schedule: Submit for Architect's action. Provide fire extinguisher cabinet schedule coordinated with final fire extinguisher schedule to ensure proper fit and function. Use same indications noted on drawings and in specifications.
 - E. Quality Assurance/Quality Control Submittals: Submit for Architect's information.
 1. Certificates:
 - a. Document Review: Submit a written statement signed by the Contractor and the Applicator stating that the Contract Documents, shop drawings and product data have been reviewed with qualified manufacturer representatives. The statement shall certify that selected materials are proper, compatible with contiguous materials and adequate for the application shown.
 - b. Installer's Qualifications.
- 1.5 INFORMATIONAL SUBMITTALS
- A. Warranty: Sample of special warranty.
- 1.6 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For fire extinguishers to include in maintenance manuals.
- 1.7 COORDINATION
- A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure proper fit and function.
 1. Wall Depths: Coordinate sizes and locations of fire extinguisher cabinets.
 2. Fire Extinguisher Type and Capacity: Coordinate fire extinguisher cabinets to ensure proper fit.
- 1.8 QUALITY ASSURANCE
- A. Qualified Installer: Installer to have 5 years' experience in the installation of specified materials on comparable projects. The firm shall have the approval of the materials manufacturer.
 - B. Regulatory Requirements: Comply with applicable requirements of the laws, codes, and regulations of Authorities Having Jurisdiction (AHJs). Obtain necessary approvals from AHJs.

1. General: Provide only fire extinguishers which comply with NFPA 10.
2. Fire Extinguisher Labels: Provide only fire extinguishers which are listed and labeled by Underwriters Laboratories Inc. or Factory Mutual System.
3. Fire Extinguisher Cabinet Labels: Where fire-rated fire extinguisher cabinets are required, comply with ASTM E814.

1.9 PROJECT CONDITIONS

- A. Do not deliver or install extinguishers until just before Substantial Completion.
- B. Do not use permanent fire extinguishers for construction period fire protection.

1.10 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.
 1. Failures include, but are not limited to, the following:
 - a. Failure of hydrostatic test according to Section 906 of the California Fire Code (2022 edition) and the Title 19 of the California Code of Regulations.
 - b. Failure of hydrostatic test according to NFPA 10 when testing interval required by NFPA 10 is within the warranty period
 - c. Faulty operation of valves or release levers.
 2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - GENERAL

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Fire-Protection Cabinets: Listed and labeled to comply with requirements in ASTM E814 for fire-resistance rating of walls where they are installed.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. NFPA Compliance: Fabricate and label fire extinguishers to comply with Section 906 of the California Fire Code (2016 edition), "Portable Fire Extinguishers."
- D. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
 1. Provide fire extinguishers approved, listed, and labeled by FM Global.

2.2 ACCEPTABLE MANUFACTURERS

- A. General: Larsens, J.L. Industries, or equal.

2.2 FIRE EXTINGUISHERS

- A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
 - 1. Provide extinguishers labeled by Underwriters Laboratories Inc. for the purpose specified and indicated.
- B. Dry Chemical Type Fire Extinguishers: Stainless steel tank, with pressure gage.
 - 1. Class ABC Multi-Purpose Dry Chemical.
 - 2. Size: 10 lbs., 4A:60B-C.
 - 3. Finish: Baked enamel, red color.

2.3 FIRE EXTINGUISHER CABINETS

- A. Product: 1724, semi-recessed cabinet, ADA compliant.
- B. Metal: Formed stainless steel sheet; 0.036-inch-thick base metal.
- C. Cabinet Configuration: Semi-recessed type, SS-1724.
 - 1. Sized to accommodate accessories.
 - 2. Exterior nominal dimensions of 9-inch-wide x 24-inch-high x 5-3/4 inch deep.
 - 3. Trim: Returned to wall surface, 1-3/8-inch-wide face.
- D. Door: 20 gage, reinforced for flatness and rigidity; latch. Hinge doors for 180 degree opening with two butt hinges. Provide nylon catch.
- E. Door Glazing: Glass, clear, 1/8 inch thick tempered. Set in resilient channel gasket glazing.
- F. Cabinet Mounting Hardware: Appropriate to cabinet. Pre-drill for anchors.
- G. Finish of Cabinet Exterior Trim and Door: Baked enamel, color as selected from standard colors.
- H. Finish of Cabinet Interior: White enamel.

2.4 ACCESSORIES

- A. Extinguisher Brackets: Formed steel, chrome-plated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install fire-protection cabinets in locations and at mounting heights indicated. Fasten cabinets to structure, square and plumb.
- B. Fire Extinguisher Installation Schedule: As shown on Drawings.

END OF SECTION

SECTION 10 51 13

METAL LOCKERS

PART 1 - EXECUTION

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Standard duty knock down lockers.

1.3 REFERENCES

- A. ADAAG - Americans with Disabilities Act, Accessibility Guidelines.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Shop Drawings: Show the following:
 - 1. Dimensioned drawings including plans, elevations, and sections to show locker locations and interfaces with adjacent substrates.
 - 2. Details of assembly, erection, anchorage and clearance requirements.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and finishes.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Protect locker finish and adjacent surfaces from damage.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Penco Products, Inc., which is located at: 1820 Stonehenge Drive, Greenville, NC 27858; Tel: 800-562-1000; Fax: 800-248-1555; Email: general@pencoproducts.com; Web: www.pencoproducts.com
- B. Lockers shall be GREENGUARD Gold Certified by UL Environment through the GREENGUARD Certification Program.

2.2 MATERIALS

- A. Steel: Prime grade mild cold-rolled sheet steel free from surface imperfection, capable of taking a high-grade enamel finish and in compliance with ASTM A1008.
- B. Steel: Sheet steel components shall be fabricated using zinc-coated steel free from surface imperfection, capable of taking a high-grade enamel finish and in compliance with ASTM A879.
- C. Bolts and Nuts: Zinc plated truss fin head bolts and hex nuts.
- D. Provide only metal lockers fabricated in the United States by a single domestic manufacturer.

2.3 STANDARD DUTY LOCKERS

- A. Standard Duty Lockers:
 - 1. Acceptable Product: Penco Vanguard, knock-down lockers.
 - 2. Tops, Bottoms, Backs, Sides, and Shelves: 24 gauge sheet steel.
 - 3. Doors 12 inches or more (305 mm) wide or 20 inches (760 mm) high: 16 gauge sheet steel.
 - 4. Doors less than 12 inches (305 mm) wide: 18 gauge sheet steel.
 - 5. Legs: 6 inches (150 mm) high (standard).
 - 6. No legs (optional).

- B. Locker Body: Steel specially formed for added strength and rigidity and to ensure tight joints at fastening points.
1. Tops and bottoms with three sides formed 90 degrees, the front offset formed to be flush with horizontal frame member.
 2. Shelves with four sides formed to 90 degrees, front edge having a second bend.
 3. Hole spacing in locker body construction: Not exceeding 9 inches (225 mm).
 4. Form door frame members to a channel shape, not less than 16 gauge steel.
 5. Provide vertical door frame members with additional 3/8 inch (9.5 mm) flange as a continuous door strike.
 6. Mortise and tenon intermembering parts; electrically weld together in a rigid assembly capable of resisting strains.
 7. Securely weld cross frame members of channel shapes to vertical framing members to ensure rigidity, including intermediate cross frame on double and triple tier lockers.
 8. Optional factory assembly of locker bodies using rivets.
 9. Center partitions: 24-gauge steel vertical partitions, full depth between bottom and shelf.
- C. Locker Doors: One piece sheet steel.
1. Multi-Point Latch Doors: Full channel formation of adequate depth to fully conceal lock bar on lock side, channel formation on hinge side, right angle formations across top and bottom, with holes for attaching number plates.
 2. Provide holes for attaching number plates.
 3. Doors over 15 inches (380 mm) wide by 60 inches (1.524 m) or 72 inches (1.828 m) high: 3 inch (75 mm) wide 20 gauge full height reinforcing pan welded to inside face of door at 6 inch (150 mm) centers.
 4. Box Lockers: Channel formations on lock and hinge sides, right angle flanges on top and bottom; pre-punch doors for padlock latch and friction catch and built-in combination and key locks.
 5. Ventilation: Provide louvered doors in manufacturer's standard louver pattern.
 - a. Doors 60 inches (1.524 m) or Higher: Louvers in groups of 6 at top and bottom.

D. Hinges:

1. Two inch high, 0.074 inch (1.88 mm) thick sheet steel, double spun, full loop, tight pin, projection welded to door frame and securely fastened to the door with two steel rivets.
 - a. Doors over 48 inches (1.066 m) high: Three 2 inch (51 mm) high five-knuckle hinges.

2.4 DOOR HANDLES AND LATCHING

A. Two Person and Duplex Lockers, 1, 2 and 3 Tier: Multi-point latching:

1. Chrome-plated zinc alloy die-cast case and handle, 40,000 psi (276 MPa) maximum tensile strength.
2. Attachment to latch bar concealed inside door and tamperproof; pulling handle out shall move latch bar up and open door in one motion.
3. Padlock Eye: For use with 9/32 inch (7.1 mm) diameter padlock, integral with handle and located so that extension of handle forms padlock strike.
4. Case: Kick-proof type shielding movable part and providing padlock strike to prevent scratching and marring the door.
5. Provide lock hole cover plate for use with padlocks.
6. Latch Clip: Glass-filled nylon engaging the door frame and holding the door shut.
 - a. Doors over 48 inches (1.066 m) High: Three points.
 - b. All other Doors: Two points.
7. Locking Device: Positive, automatic type, whereby locker may be locked when open, then closed without unlocking.
8. Firmly secure rubber silencers in frame as required.
9. Classic III Multi-point latching with recessed handles:
 - a. Recess finger-lift control handle in door.
 - b. Pocket: brushed stainless steel securely fastened to door with two tabs and a positive tamper-resistant decorative fastener; of depth sufficient to prevent a combination padlock, built-in combination lock, or key lock from protruding beyond door face.
 - c. Provide lock hole cover plate for use with padlocks.

- d. Attach 14 gauge formed steel lifting piece to latching channel with one concealed retaining lug and one rivet, ensuring a positive two-point connection.
- e. Handle finger lift: Molded, sound-deadening, attached with rivet; padlock eye for use with 9/32 inch (7.1 mm) diameter padlock shackle.
- f. Latch Clip: Glass-filled nylon engaging the door frame and holding the door shut.
 - 1) Doors 60 inches (1.524 m) and 72 inches (1.828 m) high: Three points.
 - 2) Doors 20 inches (0.508 m) to 48 inches (1.22 m) high: Two points.
- g. Locking Device: Positive, automatic type, whereby locker may be locked when open, then closed without unlocking.
- h. Firmly secure one rubber silencer in frame at each latch hook.

B. Box Lockers (4 to 6 Tier):

- 1. Punch doors for use with padlocks or built-in locks.
- 2. Equip doors for use with padlocks with an 18 gauge combination door pull, staple, and lock hole cover plate with integral friction catch.

2.5 INTERIOR EQUIPMENT

A. ADA-Compliant Lockers (Recessed Handles with Multi-Point Latch):

- 1. Single Tier Lockers: Hat shelf 48 inches (1.219 m) maximum off the floor.
- 2. Locker Compartment Bottom: Minimum of 15 inches (230 mm) off the floor, or an extra shelf placed 15 inches (381 mm) off the floor for unobstructed forward and side reach.
- 3. Handicapped symbol attached to door.
- 4. Hooks and rods as specified for other lockers.

2.6 ACCESSORIES

- A. Number Plates: Provide each locker with a polished aluminum number plate, 2-1/4 inches (57 mm) wide by 1 inch (25 mm) high, with black numerals not less than 3/8 inch (9.5 mm) high; attach to face of door with two aluminum rivets.
- B. Closed Bases: 18 gauge closed metal front and end bases, finished to match lockers.

- C. Locks: Built-in flat key locks; master-key to same series.
- D. Locks: Built-in grooved key locks (pin tumbler); master-key to same series.
- E. Locks: Built-in three-number dialing combination locks capable of at least five different combinations changes; provide master key, combination change key, and combination control charts.
- F. Padlocks: Master-keyed three-number dialing combination type padlocks; provide master key. Mechanism must be resistant to “shimming”.
- G. Coin-Operated Locks:
 - 1. Coin return/deposit type.
 - a. One quarter.
 - b. Two quarters.
 - 2. Coin collect/pay type with cash box.
 - a. One quarter.
 - b. Two quarters.
- H. Continuous Sloped Hoods: 18 gauge steel, slope rise equal to 1/3 of the locker depth (18.5 degrees), plus a 1 inch (25 mm) vertical rise at front.
 - 1. Supplied in 72 inch (1829 mm) lengths only.
 - 2. Slip joints without visible fasteners at splice locations.
 - 3. Provide necessary end closures.
 - 4. Finish to match lockers.
- I. Continuous Sloped Hoods: 16 gauge steel, slope rise equal to 1/3 of the locker depth (18.5 degrees), plus a 1 inch (25 mm) vertical rise at front.
 - 1. Supplied in 72 inch (1829 mm) lengths only.
 - 2. Slip joints without visible fasteners at splice locations.
 - 3. Provide necessary end closures.
 - 4. Finish to match lockers.
- J. Unit Slope Tops for Standard Duty Lockers: 24 gauge steel, slope rise equal to 1/3 of the locker depth, finish to match lockers.

- K. Finished End Panels: Minimum 16 gauge steel formed to match locker depth and height, 1 inch (25 mm) edge dimension; finish to match lockers; install with concealed fasteners.
- L. Front Fillers: 20 gauge steel formed in an angle shape, with 20 gauge slip joint angles formed in an angle shape with double bend on one leg forming a pocket to provide adjustable mating with angle filler.
 - 1. Attachment by means of concealed fasteners.
 - 2. Finish to match lockers.
- M. Zee Bases for Knock-Down Lockers: 14 gauge, steel flanged outward at top for support of lockers, flanged inward at bottom for anchoring to floor.
 - 1. Height: 4 inches (101 mm).
- N. Recess Trim: 18 gauge steel, 3 inch (75 mm) face dimension.
 - 1. Vertical and/or horizontal as required.
 - 2. Standard lengths as long as practical.
 - 3. Attach to lockers with concealed clips.
 - 4. Provide necessary finish caps and splices.
 - 5. Finish to match lockers.

2.7 FABRICATION

- A. Fabricate lockers square and rigid, without warp, with metal faces flat and free of distortion.
- B. Knock-Down Lockers: Fabricate lockers on the unit principle, each locker with individual door and frame, individual top, bottom, back, and shelves, with common intermediate divisions separating compartments. Verify dimensions and arrangement before fabrication.
- C. Finish: Enamel powder coat paint finish electrostatically applied and properly cured to manufacturer's specifications for optimum performance. Finishes containing volatile organic compounds and subject to out-gassing are not acceptable.
 - 1. Powder Coat - Dry Thickness: 1 to 1.2 mils (0.025 to 0.03 mm).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates and bases have been properly prepared.

- B. If substrate and bases are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 INSTALLATION

- A. Install metal lockers and accessories at locations shown in accordance with manufacturer's instructions.
- B. Install lockers plumb, level, and square.
- C. Anchor lockers to floor and wall at 48 inches (1.219 m) or less, as recommended by the manufacturer.
- D. Bolt adjoining locker units together to provide rigid installation.
- E. Install sloping tops and metal fillers using concealed fasteners. Provide flush hairline joints against adjacent surfaces.
- F. Install front bases between legs without overlap or exposed fasteners. Provide end bases on exposed ends.
- G. Install benches by fastening bench tops to pedestals and securely anchoring to the floor using appropriate anchors for the floor material.

3.3 ADJUSTING AND CLEANING

- A. Adjust doors and latches to operate without binding. Verify that latches are operating satisfactorily.
- B. Adjust built-in locks to prevent binding of dial or key and ensure smooth operation prior to substantial completion.
- C. Touch-up with factory-supplied paint and repair or replace damaged products before Substantial Completion.

3.4 PROTECTION

- A. Protect installed products until completion of project.

END OF SECTION

SECTION 10 59 10

ALUMINUM COUNTER SUPPORT BRAC ETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes: Wall mounted, heavy duty, welded aluminum brackets for supporting counter tops.
- B. Related Requirements:
 - 1. Section 06 40 23 "Interior Architectural Woodwork".
 - 2. Section 09 21 00 "Gypsum Board Assemblies", for blocking installed in stud partitions for support and anchorage of support brackets.

1.3 REFERENCES

- A. American Architectural Manufacturers Association (AAMA):
 - 1. AAMA 605.2 - Voluntary Specification for High Performance Organic Coatings on Architectural Extrusions and Panels.
 - 2. AAMA 606.1 - Voluntary Guide Specification and Inspection Methods for Integral Color Anodic Finishes for Architectural Aluminum.
 - 3. AAMA 607.1 - Voluntary Guide Specification and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum.
- B. American Society for Testing and Materials: ASTM B221 - Aluminum-Alloy Extruded Bar, Rod, Wire, Shape, and Tube.

1.4 SUBMITTALS

- A. Provide in accordance with Section 01 33 00 - Submittal Procedures:
 - 1. Product data for support brackets.
 - 2. Shop drawings indicating dimensions and installation details.
 - 3. Installation instructions.

1.5 QUALITY ASSURANCE

- A. Manufacturer qualifications: Firm specializing in designing, patenting, and fabricating unique aluminum storage systems, support brackets, handrails, and other architectural specialties with 10 years minimum successful experience.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Rangine Corporation, 330 Reservoir Street, Needham, Massachusetts 02494 800-826-6006
www.rakks.com.
- B. Requests to use equivalent products of other manufacturers shall be submitted in accordance with Section 01 25 13 - Product Substitution Procedures.

2.2 MATERIALS

- A. Material: Fabricate components from extruded aluminum sections complying with ASTM B221, 6063-T5 alloy and temper.
- B. Factory applied finishes: Exposed aluminum surfaces shall be free of scratches and other serious blemishes and be factory finished with **aluminum mill finish.** [clear anodized coating complying with AAMA 607.1 - MM10C22A31.] [black anodized coating complying with AAMA 606.1 - MM10C22A44.] [custom anodized coating with color selected by Architect and complying with AAMA 606.1 - MM10C22A44.] [electrostatically applied, [white] [custom color selected by Architect], powder paint coating complying with AAMA 605.2.] [primer suitable for field painting.]

2.3 WELDED ALUMINUM BRAC ETS

- A. Type: Support brackets fabricated by welding miter cut extruded aluminum sections, grinding and deburring sharp edges and welds, drilling holes for field attachment, and factory finishing.
- B. Flush mounted counter brackets: Bracket for 24 inches wide countertop Model No.: EH-1818FM as manufactured by Rangine Corporation.
 - 1. Construction: Fabricated from horizontal aluminum T section and vertical aluminum L section. Vertical leg designed to attach to side of supporting stud and be concealed by gypsum board or other wall finish.
 - 2. Size (height by depth): 34 by 24 inches.
 - 3. Load capacity per bracket: 300 pounds.
 - 4. Bracket spacing: 48 inches minimum.
- C. Wire management grommets: Where indicated on Drawings, provide brackets with holes and rubber grommets with 5/8 inch diameter opening to accommodate RJ-45 connector or wire ties.

PART 3 - EXECUTION

3.1 COORDINATION

- A. Coordinate provision of support brackets with design and fabrication of counter tops to be supported as specified in Section 12 36 00 to ensure compatibility of dimensions and load capacity.
- B. Coordinate requirements for stud spacing, blocking, and auxiliary structural supports to ensure adequate means for installation and anchorage of support brackets.
- C. Coordinate installation of flush mounted support brackets with application of gypsum board finish specified in Section 09 21 00 "Gypsum Board Assemblies". Ensure that brackets are delivered to site and installed in a timely manner to allow for vertical bracket leg to be concealed by gypsum board.
- D. After gypsum board has been applied to stud framing, install adhesive backed aluminum face plates around flush mounted brackets penetrating gypsum board.

3.2 INSTALLATION

- A. Install support brackets in accordance with reviewed shop drawings and manufacturer's installation instructions.
- B. Install brackets at locations and heights indicated on Drawings. Verify locations in field with Architect.
- C. Install brackets rigidly to metal studs so that they are secure, plumb, and aligned.
- D. Install with fasteners of type, size, and quantity as supplied or recommended by bracket manufacturer for type of application and substrate.

END OF SECTION

SECTION 10 81 13

BIRD CONTROL DEVICES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Provide bird control devices.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.

1.4 INFORMATIONAL SUBMITTALS

- A. Installation Instructions: For each bird deterrent.
- B. Qualification Data: For Installer.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain bird deterrent from single source from single manufacturer.
- B. Installer Qualifications:
 - 1. Installer must obtain, review, and understand all hardware installation guidelines.
 - 2. Installer must be completely familiar with the proper installation procedures for the netting and bird netting hardware and spike strips.
- C. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store bird control devices and surface cleaning systems in manufacturer's original packaging until needed for installation. Protect and maintain shipping boxes dry, clean and undamaged. Do not stack or place other packaging or objects on shipping boxes.

1.7 PROJECT CONDITIONS

- A. Coordination: Visit site and field-measure existing conditions prior to fabrication and delivery of materials.

1.8 WARRANTY

- A. Minimum Warranty Requirements: Manufacturer's standard.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Bird Control Devices:
 - 1. Manufacturers: Bird Barrier America, Inc.; Bird-B-Gone, Inc.
 - 2. Type: Bird netting.
 - 3. Removal: Existing bird waste and detritus.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive bird control devices and verify that substrate is sound, dry, smooth, clean, and free of oil, grease, dust or dirt.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Field Measurements: Verify the dimensions for each surface to receive bird control devices. Use manufacturer's work sheet to determine sufficient quantities of bird posts will be installed on each surface specified for bird control.

3.2 SURFACE CLEANING

- A. All surfaces to be clean, dry and free of obstructions before bird control is installed.
- B. If bird waste is present: Treat, neutralize and safely remove all bird waste from installation surfaces. Installer must follow all cities, state and federal regulations regarding the proper removal and disposal of bird droppings.
- C. Use surface cleaning products to neutralize any bird droppings, nests and related waste materials that may be present. Allow all surfaces to air dry completely, and then reapply to sanitize and deodorize the surface before proceeding. Strictly follow treatment instructions provided with Manufacturer's surface cleaning products.
- D. Use anti-bacterial personal protection products to help prevent disease transmittal when working around surfaces contaminated with bird droppings.

3.3 INSTALLATION OF BIRD NETTING

- A. Install the bird netting hardware as recommended by manufacturer.
 - 1. Install perimeter and support hardware.
 - 2. Attach bird netting to installed hardware.
 - 3. Install access or additional support hardware as specified.
- B. If necessary cut the netting system to fit the area. If multiple pieces are required, join the pieces together with manufacture's recommended seam fastening hardware.
- C. Install netting system to avoid contact with machinery, vehicles, extreme heat, tree branches, etc. Make necessary adjustments to keep netting a sufficient distance from these objects or conditions.

- D. Finished netting installation shall be taught, free of wrinkles, gaps and openings.

3.4 ADJUSTING AND CLEANING

- A. Remove and replace damaged or broken bird control devices.
- B. Remove excess bird control devices and debris from Project site.

END OF SECTION

SECTION 11 30 13

PANTRY APPLIANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Refrigeration appliances.
- B. Related Requirements:
 - 1. Section 22 41 00 "Residential Plumbing Fixtures" for kitchen sinks, dishwasher air-gap fittings, waste (garbage) disposers, and instant hot-water dispensers.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include installation details, material descriptions, dimensions of individual components, and finishes for each appliance.
 - 2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.
- B. Samples: For each exposed product and for each color and texture specified, in manufacturer's standard size.
- C. Product Schedule: For appliances. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.
- B. Product Certificates: For each type of appliance.
- C. Field quality-control reports.
- D. Sample Warranties: For manufacturers' special warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For each residential appliance to include in operation and maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Maintains, within 50 miles of Project site, a service center capable of providing training, parts, and emergency maintenance repairs.

1.8 WARRANTY

- A. Warranty Period: Five years from date of Substantial Completion

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Electrical Appliances: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Accessibility: Where residential appliances are indicated to comply with accessibility requirements, comply with applicable provisions in the DOJ's 2010 ADA Standards for Accessible Design.

2.2 ICE MAKER

- A. Manufacturer: Marvel Refrigeration.
- B. Model: Low Profile Collection MCP215/MACL215.
- C. Finish: Stainless Steel.

2.3 FRIDGE

- A. Manufacturer: Marvel Refrigeration.
- B. Model: Low Profile Collection MCP215/MACL215.
- C. Finish: Stainless Steel.

2.4 DISHWASHER

- A. Manufacturer: Marvel Refrigeration.

- B. Model: Low Profile Collection MCP215/MACL215.
- C. Finish: Stainless Steel.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, power connections, and other conditions affecting installation and performance of residential appliances.
- B. Examine roughing-in for piping systems to verify actual locations of piping connections before appliance installation.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install appliances according to manufacturer's written instructions.
- B. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and that rough openings are completely concealed.
- C. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.

3.3 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
 - 1. Perform visual, mechanical, and electrical inspection and testing for each appliance according to manufacturers' written recommendations. Certify compliance with each manufacturer's appliance-performance parameters.
 - 2. Leak Test: After installation, test for leaks. Repair leaks and retest until no leaks exist.
 - 3. Operational Test: After installation, start units to confirm proper operation.
 - 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and components.
- B. An appliance will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain residential appliances.

END OF SECTION

SECTION 12 36 00

SOLID SURFACING FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Solid surface material countertops and backsplashes.

- B. Related Requirements:

- 1. Section 22 41 00 " Plumbing Fixtures".

1.3 ACTION SUBMITTALS

- A. Product Data: For countertop materials and sinks.

- B. Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.

- 1. Show locations and details of joints.
 - 2. Show direction of directional pattern, if any.

- C. Samples for Initial Selection: For each type of material exposed to view.

- D. Samples for Verification: For the following products:

- 1. Countertop material, 6 inches square.
 - 2. One full-size solid surface material countertop, with front edge and backsplash, 8 by 10 inches, of construction and in configuration specified.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For solid surface material countertops to include in maintenance manuals. Include Product Data for care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate countertops similar to that required for this Project, and whose products have a record of successful in-service performance.
- B. Installer Qualifications: Fabricator of countertops.

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify dimensions of countertops by field measurements after base cabinets are installed but before countertop fabrication is complete.

1.8 COORDINATION

- A. Coordinate locations of utilities that will penetrate countertops or backsplashes.

PART 2 - PRODUCTS

2.1 QUARTZ SURFACE COUNTERTOPS

- A. Acceptable Manufacturers:
 - 1. Corian Quartz: www.corian.com
 - 2. Zodiaq Quartz by DuPont: www.corian.com
 - 3. CaesarStone U.S.A., Inc., "CaesarStone Quartz: www.caesarstoneus.com
- B. Solid Surfacing Material: 90 percent crushed quartz aggregate combined with resins and pigments and fabricated into slabs using a vacuum vibro-compaction process.
- C. Size and Shape: As indicated on drawings.
- D. Quality Standard: Comply with Woodwork Institute Section 4.4.20 Material Rules and Section 11.4.5.C "Solid Surface Countertops".
 - 1. Grade: Premium.

2. Thickness of solid surfacing shall be constant and shall not vary.
- E. Fabrication: Fabricate tops in one piece with shop-applied backsplashes and edges, unless otherwise indicated. Comply with solid surfacing material manufacturer's recommendations for adhesives, sealers, fabrication, and finishing.
1. Drill holes in countertops for plumbing fittings.
 2. Thickness: 30mm.
 3. Color: 2003 Concrete.
 4. Edge Profile: Mitered.

2.2 ACCESSORIES

- A. Adhesives: For seams and drop edges, color to blend with sheet material.
- B. VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with the limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Fasteners: Size and type to suit application.
- D. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel, or chrome-plated finish in exposed locations.
- E. Concealed Joint Fasteners: Threaded steel.
- F. Grommets: Standard plastic grommets for cut-outs, in color to match adjacent surface.

2.3 FABRICATION

- A. Assemble work at shop following manufacturer's printed fabrication instructions and deliver to job ready for installation. Manufacture in largest practical pieces for handling and shipping without seams.
 1. Grade: AWI, Premium
 2. Fabricate work square and to required lines.
 3. Recess and conceal fasteners, connections, and reinforcing.
 4. Design construction and installation details to allow for expansion and contraction of materials. Properly frames material with tight, hairline joints held rigidly in place.

5. Fabricate countertops and vanities with back splash and side splash pieces to profiles and sizes indicated.
6. Fabricate items to profiles shown with connections and supports as indicated or as required for complete installation in accordance with manufacturer's written instructions and approved submittals.
7. Provide cut-outs for plumbing fixtures and trim, washroom accessories, appliances, and related items. Confirm layout with manufacturer's cut-out templates before beginning work. Round corners of cut-outs and sand edges smooth.
8. Do not exceed manufacturer's recommended unsupported overhang distances.
9. Finish exposed surfaces smooth and polish to low sheen.
10. Radius corners and edges.

B. Adhesive: Product recommended by solid surface material manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates to receive solid surface material countertops and conditions under which countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install countertops level to a tolerance of 1/8 inch in 8 feet, 1/4 inch maximum. Do not exceed 1/64-inch difference between planes of adjacent units.
- B. Fasten countertops by screwing through corner blocks of base units into underside of countertop. Pre-drill holes for screws as recommended by manufacturer. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
- C. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.
- D. Secure countertops to subtops with adhesive according to solid surface material manufacturer's written instructions. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface

- E. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.
 - 1. Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned and joints are of specified width.
- F. Install backsplashes and end splashes by adhering to wall and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.
- G. Where shown on Drawings, install aprons to backing and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears. Fasten by screwing through backing. Predrill holes for screws as recommended by manufacturer.
- H. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.
 - 1. Seal edges of cutouts in particleboard subtops by saturating with varnish.
- I. Apply sealant to gaps at walls; comply with Section 07 92 00 "Joint Sealants."

END OF SECTION

SECTION 14 21 00

ELECTRIC TRACTION ELEVATOR

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes: Electric Traction Elevators.
- B. Products Supplied But Not Installed Under this Section:
 - 1. Hoist Beam
 - 2. Pit Ladder
 - 3. Inserts mounted in block walls for rail attachments
- C. Work Supplied Under Other Sections:
 - 1. Temporary lighting, including temporary lighting in hoistway for machine space with switch located in hoistway on the strike jamb side of top landing door.
 - 2. Guide Rail Support shall be structurally adequate to extend from pit floor to top of hoistway, with spans in accordance with requirements of authority having jurisdiction and final layouts.
 - 3. Removable barricades at all hoistway openings, in compliance with OSHA 29 CFR 1926.502 in addition to any local code requirements.
 - 4. Lifeline attachments capable of withstanding 5000 lb load in accordance with OSHA 29 CFR 1926.502. Provide a minimum of 2 at the top, front of each hoistway.
 - 5. Pit lighting: Fixture with switch and guards. Provide illumination level equal to or greater than that required by ASME A17.1/CSA B44 2000, or applicable version.
 - 6. Control space lighting with switch. Coordinate switch with lighting for machine space as allowable by code.
- D. Related sections:
 - 1. Section 015000 - Temporary Facilities and Controls
 - 2. Section 033000 - Cast-in-Place Concrete:
 - 3. Section 055000 - Metal Fabrications
 - 4. Section 230000 - Heating, Ventilating, and Air Conditioning
 - 5. Section 260000 - Electrical
 - 6. Section 283100 - Fire Detection and Alarm
- E. Industry and government standards:
 - 1. ICC/ANSI A117.1 Accessible and Usable Buildings and Facilities
 - 2. ADAAG - Accessibility Guidelines for Buildings and Facilities
 - 3. ANSI/NFPA 70, National Electrical Code
 - 4. ANSI/NFPA 80, Standard for Fire Doors and Fire Windows

5. ASME/ANSI A17.1, Safety Code for Elevators and Escalators.

1.3 DESCRIPTION OF ELEVATOR

- A. Elevator Equipment: MonoSpace® 500 DX gearless traction elevator.
- B. Signalization and Hall Station: KSS 570, finish: brushed stainless steel (4SS; Grade 304).
- C. Equipment Control: KCM831
- D. Drive: Non Regenerative
- E. Quantity of Elevators: As shown on Drawings.
- F. Landings: Maximum 5.
- G. Openings: As shown on Drawings.
- H. Opening Type: CO.
- I. Hoistway (W x D): 9'-8" x 6'-11".
- J. Travel: Maximum 150 feet.
- K. Rated Capacity: 4,000 lbs.
- L. Rated Speed: 150 FPM.
- M. Clear Inside Dimensions: (W x D) 7'-6 11/16" x 5'-6 5/8"; 6-inch drop ceiling.
- N. Car Height: 9'-0"
- O. Door Width: 4'-0" with stretcher accommodation.
- P. Entrance Height: 8'-0"
- Q. Pit Depth: 5'-0".
- R. Clear Overhead: 13'-8".
- S. Control Space: 2,000 to 5,000 AIA; adjacent or remote room, 5'-0" width by dimension shown on Drawings; 3'-0" door width.
- T. Main Power Supply: 480 V Volts + 5%, three-phase.
- U. Operation: Duplex.
- V. Machine Location: Inside the hoistway mounted on car guide rail.
- W. Elevator Equipment shall conform to the requirements of project seismic zone.
- X. Maintenance Service Period: 12 Months.

1.4 PERFORMANCE REQUIREMENTS

- A. Car Performance
 - 1. Car Speed \pm 5% of contract speed under any loading condition or direction of travel.
 - 2. Car Capacity: Safely lower, stop and hold (per code) up to 125% of rated load.

- B. System Performance
 - 1. Vertical Vibration (maximum): 15 mg ISO187338/ISO 8041 system pk – pk
 - 2. Horizontal Vibration (maximum): 12 mg ISO187338/ISO 8041 system pk – pk
 - 3. Jerk Rate (maximum): 3.3 ft/sec³
 - 4. Acceleration (maximum): 1.3 ft/sec²
 - 5. In Car Noise: 55 dB(A) Maximum
 - 6. Leveling Accuracy: \pm 0.2 inches
 - 7. Starts per hour (maximum): 240

1.5 SUBMITTALS

- A. Comply with Section 01 33 00 - Submittal Procedures.

- B. Product Data: Submit manufacturer's product literature for each proposed system.
 - 1. Cab design, dimensions and layout.
 - 2. Layout, finishes, and accessories and available options.
 - 3. Controls, signals and operating system.
 - 4. Color selection charts for cab and entrances.

- C. Shop Drawings:
 - 1. Clearances and travel of car.
 - 2. Clear inside hoistway and pit dimensions.
 - 3. Location and layout of equipment and signals.
 - 4. Car, guide rails, buffers and other components in hoistway.
 - 5. Maximum rail bracket spacing.
 - 6. Maximum loads imposed on building structure.
 - 7. Hoist beam requirements.
 - 8. Location and sizes of access doors.
 - 9. Location and details of hoistway door and frames.
 - 10. Electrical characteristics and connection requirements.

- D. Operation and maintenance data:
 - 1. Provide manufacturer's standard maintenance and operation manual.

- E. Diagnostic Tools
 - 1. Prior to seeking final acceptance for the completed project as specified by the Contract Documents, the Elevator Contractor shall deliver to the Owner any specialized tool(s) that may be required to perform diagnostic evaluations, adjustments, and/or parametric software changes and/or test and inspections on any piece of control or monitoring equipment installed.
 - 2. This shall include any specialized tool(s) required for monitoring, inspection and/or maintenance where the means of suspension other than conventional wire ropes are furnished and installed by the Elevator Contractor. Any and all such tool(s) shall become

property of the Owner. Any diagnostic tool provided to the Owner by the Elevator Contractor shall be configured to perform all levels of diagnostics, systems adjustment and parametric software changes which are available to the Elevator Contractor.

3. In those cases where diagnostic tools provided to the Owner require periodic recalibration/or re-initiation, the Elevator Contractor shall perform such tasks at no additional cost to the Owner for a period equal to the term of the maintenance agreement from the date of final acceptance of the completed project. During those intervals in which the Owner might find it necessary to surrender a diagnostic tool for re-calibration, re-initiation, or repair, the Elevator Contractor shall provide a temporary replacement for the tool at no additional cost to the Owner.
4. The Elevator Contractor shall deliver to the Owner, printed instructions for the proper use of any tool that may be necessary to perform diagnostic evaluations, system adjustment, and/or parametric software changes on any unit of microprocessor-based elevator control equipment and means of suspension other than standard elevator steel cables furnished and install by the Elevator Contractor.
5. Accompanying the printed instructions shall be any and all access codes, password, or other proprietary information that is necessary to interface with the microprocessor-control equipment.

1.6 QUALITY ASSURANCE

- A. Manufacturer: Minimum of fifteen years' experience in the fabrication, installation and service of elevators of the type and performance of the specified. The manufacturer shall have a documented quality assurance program.
- B. Installer: The equipment manufacturer shall install the elevator.
- C. Inspection and Testing: In accordance with requirements of local jurisdiction, obtain required permits, inspections and tests.

1.7 DELIVERY, STORAGE AND HANDLING

- A. If the construction site is not prepared to receive the elevator equipment at the agreed ship date, the General Contractor shall be responsible to provide a safe, dry, and easily accessible storage area on or off the premises. Additional labor costs for double handling will be the responsibility of the general contractor.
- B. Delivered elevator materials shall be stored in a protected environment in accordance with manufacturer recommendations. A minimum storage area of 10 feet by 20 feet is required adjacent to the hoistway.

1.8 WARRANTY

- A. Provide manufacturer warranty for a period of one year. The warranty period is to begin upon Substantial Completion of the Contract. Warranty covers defects in materials and workmanship. Damage due to ordinary use, vandalism, improper or insufficient maintenance, misuse, or neglect do not constitute defective material or workmanship.

1.9 MAINTENANCE SERVICE

- A. The elevator manufacturer shall provide maintenance service consisting of regular examinations and adjustments of the elevator equipment for a period of 12 months after date of substantial completion. Replacement parts shall be produced by the original equipment manufacturer.

- B. Maintenance service to be performed during regular working hours of regular working days and shall include emergency call back service during regular working hours.
- C. Maintenance service shall not include adjustments, repairs or replacement of parts due to negligence, misuse, abuse or accidents.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Provide AC gearless machine room-less elevator systems subject to compliance with the design and performance requirements of this specification. Elevator manufacturers may include but are not limited to one of the following:
 - 1. Basis of Design: MonoSpace® 500 traction elevators by KONE, Inc. (www.kone.com).
 - 2. Other acceptable machine room-less products: manufacturer with minimum 15 years experience in manufacturing, installing, and servicing elevators of the type required for the project.

2.2 EQUIPMENT: CONTROL COMPONENTS AND CONTROL SPACE

- A. Controller: Provide microcomputer based control system to perform all of the functions.
 - 1. All high voltage (110V or above) contact points inside the controller cabinet shall be protected from accidental contact in a situation where the controller doors are open.
 - 2. Controller shall be separated into two distinct halves; Motor Drive side and Control side. High voltage motor power conductors shall be routed and physically segregated from the rest of the controller.
 - 3. Provide a serial cardrack and main CPU board containing a non-erasable EPROM and operating system firmware.
 - 4. Variable field parameters and adjustments shall be contained in a non-volatile memory module.
- B. Drive: Provide Variable Voltage Variable Frequency AC drive system to develop high starting torque with low starting current.
- C. Controller Location: Locate controller{s} in the front wall integrated with the top landing entrance frame, machine side of the elevator. One non-fused three phase permanent power in hoist way at top landing. A separate control space should not be required.

2.3 EQUIPMENT: HOISTWAY COMPONENTS

- A. Machine: AC gearless machine, with permanent magnet synchronous motor, direct current electro-mechanical disc brakes and integral traction drive sheave, mounted to the car guide rail at the top of the hoistway.
- B. Governor: Friction type over-speed governor rated for the duty of the elevator specified.
- C. Buffers, Car and Counterweight: Brushed Stainless Steel.

- D. Hoistway Operating Devices:
 - 1. Emergency stop switch in the pit
 - 2. Terminal stopping switches.
 - 3. Emergency stop switch on the machine
- E. Positioning System: System consisting of magnets and proximity switches.
- F. Guide Rails and Attachments: Steel rails with brackets and fasteners.

2.4 EQUIPMENT: HOISTWAY ENTRANCES

- A. Hoistway Entrances
 - 1. Sills: Aluminum extruded.
 - 2. Doors: Hollow metal construction with vertical internal channel reinforcements.
 - 3. Fire Rating: Entrance and doors shall be UL fire-rated for 1-1/2 hour.
 - 4. Entrance Finish: Brushed Stainless Steel.
 - 5. Entrance Markings Jamb Plates: Provide standard entrance jamb tactile markings on both jambs, at all floors. Plate Mounting: Refer to manufacturer drawings.

2.5 EQUIPMENT: CAR COMPONENTS Right/Left Openings

- A. Car Frame: Provide car frame with adequate bracing to support the platform and car enclosure.
- B. Platform: Platform shall be all steel construction.
- C. Car Guides: Provide guide-shoes mounted to top and bottom of both car and counterweight frame. Each guide-shoe assembly shall be arranged to maintain constant contact on the rail surfaces. Provide retainers in areas with Seismic design requirements.
- D. Steel Cab.
- E. Car Wall Finishes:
 - 1. Wilson Art "Asian Night" (L418; 7949-38)
 - 2. Colored Glass: Siberian Glaze (GW-1), premium finish.
 - 3. Rear Wall: Non-removable vertical brushed stainless steel panels
 - 4. Side Walls: Non-removable vertical brushed stainless steel panels
 - 5. Rear Wall: Raised Removable vertical panels Brushed Stainless Steel (441).
 - 6. Side Walls: Raised Removable vertical Brushed Stainless Steel (441)
- F. Car Skirting Finish: Brushed Stainless Steel
- G. Car Front Finish: Brushed Stainless Steel
- H. Car Door Finish: Brushed Stainless Steel
- I. Ceiling: Polygal panel, T5 Fluorescent tubes
- J. Handrail: Brushed Stainless Steel
 - 1. Rails to be located on Back Wall of car enclosure.

- K. Sills: Aluminum extruded.
- L. Flooring: By others. (Not to exceed 6lb/sqft and 1/2" finished depth.)
- M. Emergency Car Signals
 - 1. Emergency Siren: Siren mounted on top of cab that is activated when the alarm button in the car operating panel is engaged. Siren shall have rated sound pressure level of 80 dB(A) at a distance of three feet from device. Siren shall respond with a delay of not more than one second after activation of alarm button.
 - 2. Emergency Car Lighting: Provide emergency power unit employing a 12- volt sealed rechargeable battery and totally static circuits shall illuminate the elevator car and provide current to the alarm bell in the event of building power failure.
 - 3. Emergency Exit Contact: An electrical contact shall be provided on the car-top exit.
- N. Ventilation: Fan.

2.6 EQUIPMENT: SIGNAL DEVICES AND FIXTURES

- A. Car Operating Panel: Provide car operating panel with all push buttons, key switches, and message indicators for elevator operation. Fixture finish to be: Brushed Stainless Steel
 - 1. Main Flush mounted car operating panel shall contain a bank of round, mechanical, illuminated buttons marked to correspond to landings served, emergency call button, door open button, door close button, and key switches for lights, inspection, and exhaust fan. Buttons have Amber Dot Matrix illumination (halo). All buttons to have raised text and Braille marking on left hand side. The car operating display panel shall be Amber Dot Matrix. All texts, when illuminated, shall be Amber Dot Matrix. The car operating panel shall have a Brushed Stainless Steel finish.
 - 2. Additional features of car operating panel shall include:
 - a. Car Position Indicator within operating panel Brushed Stainless Steel
 - b. Elevator Data Plate marked with elevator capacity and car number on car top.
 - c. Help buttons with raised markings.
 - d. In car stop switch per local code.
 - e. Call Cancel Button.
- B. Hall Fixtures: Wall mounted hall fixtures shall be provided with necessary push buttons and key switches for elevator operation. Wall mounted hall fixtures shall have a Brushed Stainless Steel finish.
 - 1. Hall fixtures shall feature round, mechanical, buttons in applied mount face frame. Hall fixtures shall correspond to options available from that landing. Buttons shall be in a vertically mounted fixture.
- C. Hall Lanterns and Chime: A directional lantern visible from the corridor shall be provided at each hall entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel and a chime will sound. The chime will sound once for up and twice for down. The hall lantern face plate shall have a Brushed Stainless Steel finish.

2.7 EQUIPMENT: ELEVATOR OPERATION AND CONTROLLER

A. Elevator Operation:

1. Duplex Collective Operation (two cars): Using a microprocessor-based controller, the operation shall be automatic by means of the car and hall buttons. In the absence of system activity, one car can be made to park at the pre-selected main landing. The other car shall remain at the last landing served. Only one car shall respond to a hall call. If either car is removed from service, the other car shall immediately answer all hall calls, as well as its own car calls.
2. Zoned Car Parking.
3. Relative System Response Dispatching.

B. Standard Operating Features to include:

1. Full Collective Operation
2. Fan and Light Control.
3. Load Weighing Bypass.
4. Ascending Car Uncontrolled Movement Protection
5. Top of Car Inspection Station.

C. Additional Operating Features to include:

D. Elevator Control System for Inspections and Emergency

1. Provide devices within controller to run the elevator in inspection operation.
2. Provide devices on car top to run the elevator in inspection operation.
3. Provide within controller an emergency stop switch to disconnect power from the brake and prevents motor from running.
4. Provide the means from the controller to mechanically lift and control the elevator brake to safely bring car to nearest available landing when power is interrupted.
5. Provide the means from the controller to reset the governor over speed switch and also trip the governor.
6. Provide the means from the controller to reset the emergency brake when set because of an unintended car movement or ascending car over speed.
7. Provide the means for the control to reset elevator earthquake operation.

2.8 EQUIPMENT: DOOR OPERATOR AND CONTROL

A. Door Operator: A closed loop permanent magnet VVVF high-performance door operator shall be provided to open and close the car and hoistway doors simultaneously. Door movement shall be cushioned at both limits of travel. Electro-mechanical interlock shall be provided at each hoistway entrance to prevent operation of the elevator unless all doors are closed and locked. An electric contact shall be provided on the car at each car entrance to prevent the operation of the elevator unless the car door is closed.

B. The door operator shall be arranged so that, in case of interruption or failure of electric power, the doors can be readily opened by hand from within the car, in accordance with applicable code. Emergency devices and keys for opening doors from the landing shall be provided as required by local code.

C. Doors shall open automatically when the car has arrived at or is leveling at the respective landings. Doors shall close after a predetermined time interval or immediately upon pressing of a car button.

A door open button shall be provided in the car. Momentary pressing of this button shall reopen the doors and reset the time interval.

- D. Door hangers and tracks shall be provided for each car and hoistway door. Tracks shall be contoured to match the hanger sheaves. The hangers shall be designed for power operation with provisions for vertical and lateral adjustment. Hanger sheaves shall have polyurethane tires and pre-lubricated sealed-for-life bearings.
- E. Electronic Door Safety Device. The elevator car shall be equipped with an electronic protective device extending the full height of the car. When activated, this sensor shall prevent the doors from closing or cause them to stop and reopen if they are in the process of closing. The doors shall remain open as long as the flow of traffic continues and shall close shortly after the last person passes through the door opening.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Field measure and examine substrates, supports, and other conditions under which elevator work is to be performed.
- B. Do not proceed with work until unsatisfactory conditions are corrected.
- C. Prior to start of Work, verify hoistway is in accordance with shop drawings. Dimensional tolerance of hoistway from shop drawings: -0 inches +2 inches. Do not begin work of this section until dimensions are within tolerances.
- D. Prior to start of Work, verify projections greater than 2 inches (4 inches if ASME A17.1/CSA B44 2000 applies) must be beveled not less than 75 degrees from horizontal.
- E. Prior to start of Work, verify landings have been prepared for entrance sill installation. Traditional sill angle or concrete sill support shall not be required.
- F. Prior to start of Work, verify elevator pit has been constructed in accordance with requirements, is dry and reinforced to sustain vertical forces, as indicated in approved submittal. Verify that sumps or sump pumps located within pit will not interfere with installed elevator equipment.
- G. Prior to start of Work, verify control space has been constructed in accordance with requirements, with access coordinated with elevator shop drawings, including Sleeves and penetrations.
- H. Verify installation of GFCI protected 20-amp in pit and adjacent to each signal control cabinet in control space.

3.2 PREPARATION

- A. Coordinate installation of anchors, bearing plates, brackets and other related accessories.

3.3 INSTALLATION

- A. Install equipment, guides, controls, car and accessories in accordance with manufacturer installation methods and recommended practices.

- B. Properly locate guide rails and related supports at locations in accordance with manufacturer's recommendations and approved shop drawings. Anchor to building structure using isolation system to minimize transmission of vibration to structure.
- C. All hoistway frames shall be securely fastened to fixing angles mounted in the hoistway. Coordinate installation of sills and frames with other trades.
- D. Lubricate operating system components in accordance with manufacturer recommendations.
- E. Perform final adjustments, and necessary service prior to substantial completion.

3.4 CONSTRUCTION

- A. Interface with Other Work:
 - 1. Guide rail brackets attached to steel shall be installed prior to application of fireproofing.
 - 2. Coordinate construction of entrance walls with installation of door frames and sills. Maintain front wall opening until elevator equipment has been installed.
 - a. Ensure adequate support for entrance attachment points at all landings.
 - b. Coordinate wall openings for hall push buttons, signal fixtures and sleeves. Each elevator requires sleeves within the hoistway wall.
 - c. Coordinate emergency power transfer switch and power change pending signals as required for termination at the primary elevator signal control cabinet in each group.
 - d. Coordinate interface of elevators and fire alarm system.
 - e. Coordinate interface of dedicated telephone line.

3.5 TESTING AND INSPECTIONS

- A. Perform recommended and required testing in accordance with authority having jurisdiction.
- B. Obtain required permits and provide originals to Owner's Representative.

3.6 DEMONSTRATION

- A. Prior to substantial completion, instruct Owner's Representative on the proper function and required daily maintenance of elevators. Instruct personnel on emergency procedures.

END OF SECTION