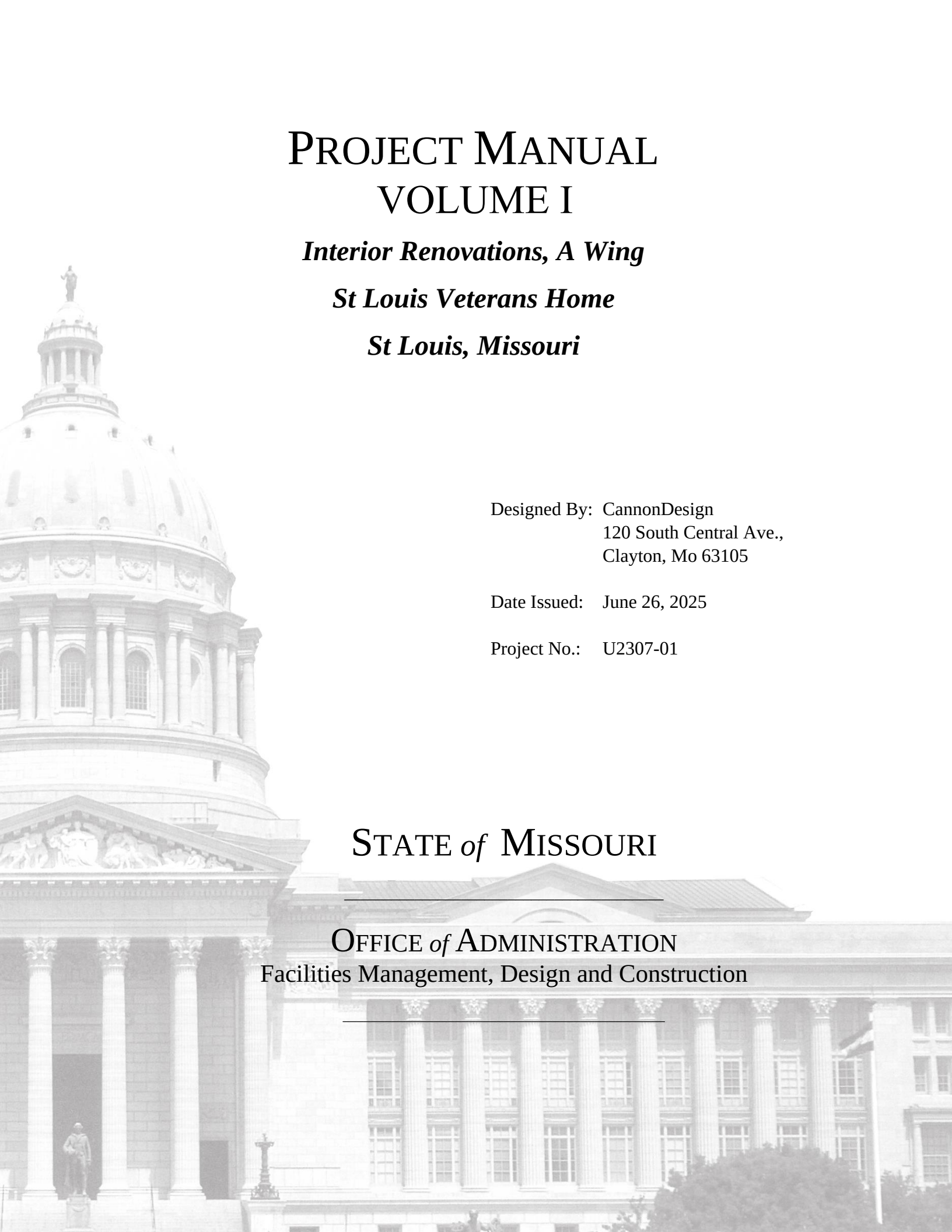




PROJECT MANUAL VOLUME I

Interior Renovations, A Wing St Louis Veterans Home St Louis, Missouri

Designed By: CannonDesign
120 South Central Ave.,
Clayton, Mo 63105

Date Issued: June 26, 2025

Project No.: U2307-01

STATE *of* MISSOURI

OFFICE *of* ADMINISTRATION
Facilities Management, Design and Construction

SECTION 000107 - PROFESSIONAL SEALS AND CERTIFICATIONS

CANNONDESIGN PROJECT NUMBER: 005680.00

THE FOLLOWING DESIGN PROFESSIONALS HAVE SIGNED AND SEALED THE ORIGINAL PLANS AND SPECIFICATIONS FOR THIS PROJECT, WHICH ARE ON FILE WITH THE DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION:

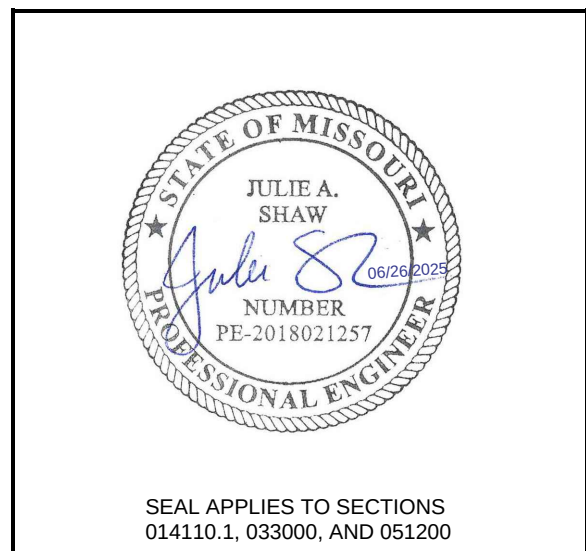
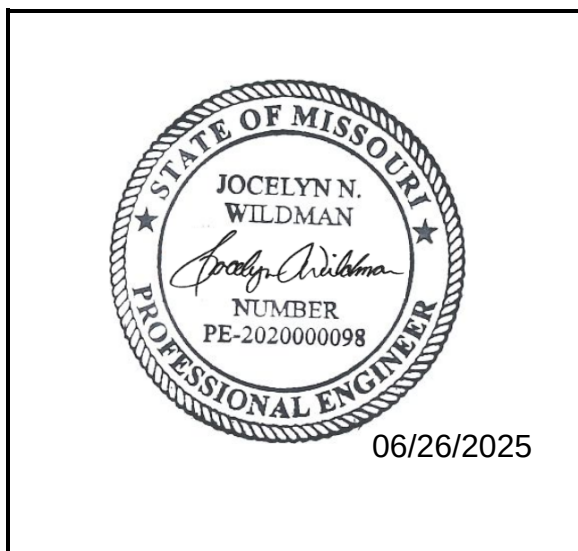
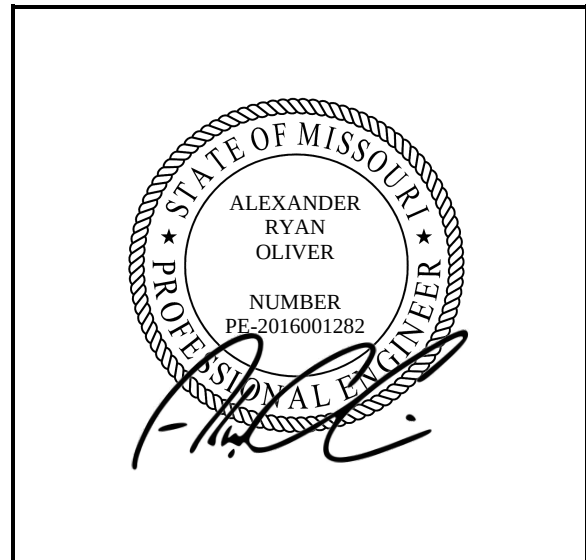
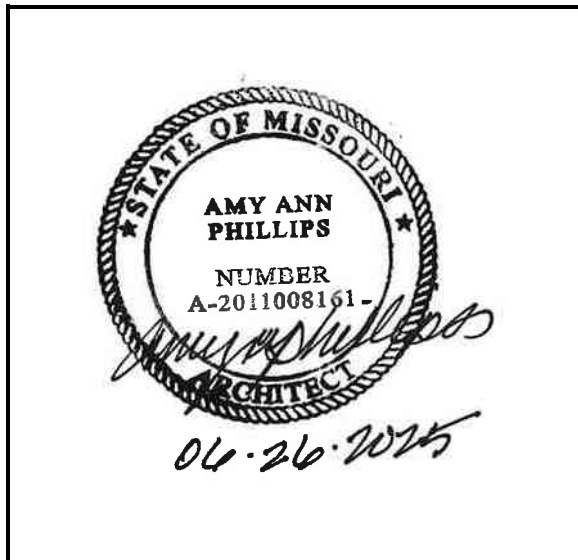


TABLE OF CONTENTS

SECTION	TITLE	NUMBER OF PAGES
DIVISION 00 – PROCUREMENT AND CONTRACTING INFORMATION		
000000	INTRODUCTORY INFORMATION	
000101	Project Manual Cover	1
000107	Professional Seals and Certifications	1
000110	Table of Contents	4
000115	List of Drawings	4
001116	INVITATION FOR BID (IFB)	1
002113	INSTRUCTIONS TO BIDDERS	7
<u>NOTICE TO BIDDERS</u>		
The following procurement forms can be found on our website at: https://oa.mo.gov/facilities/bid-opportunities/bid-listing-electronic-plans and shall be submitted with your bid to FMDCBids@oa.mo.gov		
004000	PROCUREMENT FORMS & SUPPLEMENTS	
004113	Bid Form	*
004322	Unit Prices Form	*
004323	Supplement A – Cost Breakdown	*
004336	Proposed Subcontractors Form	*
004337	MBE/WBE/SDVE Compliance Evaluation Form	*
004338	MBE/WBE/SDVE Eligibility Determination	*
	Form for Joint Ventures	
004339	MBE/WBE/SDVE Good Faith Effort (GFE)	*
	Determination Forms	
004340	SDVE Business Form	*
004541	Affidavit of Work Authorization	*
004545	Anti-Discrimination Against Israel Act Certification form	*
<u>Additional Federal Forms Required with Bid:</u>		
	• Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion	*
	• Build America, Buy America Certification	*
	• Certification of Non-Segregated Facilities	*
005000	CONTRACTING FORMS AND SUPPLEMENTS	
005213	Construction Contract	3
006000	PROJECT FORMS	
006113	Performance and Payment Bond	2
006325	Product Substitution Request	2
006519.16	Final Receipt of Payment and Release Form	1
006519.18	MBE/WBE/SDVE Progress Report	1
006519.21	Affidavit of Compliance with Prevailing Wage Law	1
<u>Additional Federal Forms Required:</u>		
	Certificate of Materials Origin	2
	Build America Buy America Waiver Request	14
007000	CONDITIONS OF THE CONTRACT	
007213	General Conditions	20
007300	Supplementary Conditions	1
007333	Supplementary General Conditions for Federally Funded/Assisted Construction Projects	16
007346	Wage Rate	4
DIVISION 1 - GENERAL REQUIREMENTS		
011000	Summary of Work	3
	Attachment – FFE Equipment Responsibility	2
	Attachment – Owner Pre-purchased Materials Schedule	8
012200	Unit Prices	2
012300	Alternates	2
012600	Contract Modification Procedures	2
013100	Coordination	5
SECTION 000110 – TABLE OF CONTENTS		
01/2025		

013115	Project Management Communications	4
013200	Schedules	5
013300	Submittals	5
	Attachment – E-Builder Submittal Register	10
013513.28	Site Security and Health Requirements (State Fair, Veterans, MONG)	6
014110	Special Inspections and Testing	4
	Attachment – Statement of Special Inspections	9
014200	References	12
015000	Construction Facilities and Temporary Controls	8
017329	Cutting and Patching	7
017400	Cleaning	5

TECHNICAL SPECIFICATIONS INDEX:

DIVISION 02 – EXISTING CONDITIONS

024119	Selective Structure Demolition	11
--------	--------------------------------	----

DIVISION 03 – CONCRETE

033000	Cast-In-Place Concrete	36
033540	Concrete Densifier-Sealer Treatment	2
035416	Hydraulic Cement Underlayment	3

DIVISION 05 – METALS

051200	Structural Steel Framing	27
055000	Metal Fabrications	10

DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES

061000	Rough Carpentry	12
064023	Interior Architectural Woodwork	17
064216	Flush Wood Paneling	5

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

072100	Thermal Insulation	2
076200	Sheet Metal Flashing and Trim	7
078413	Penetration Firestopping	10
078443	Joint Firestopping	6
079200	Joint Sealants	9

DIVISION 08 - OPENINGS

081113	Hollow Metal Doors and Frames	10
081416	Flush Wood Doors	7
081433	Stile and Rail Wood Doors	5
083113	Access Doors and Frames	4
087100	Door Hardware	20
088000	Glazing	7
088813	Fire-Resistant Glazing	6
089119	Fixed Louvers	5

DIVISION 09 - FINISHES

090561.13	Moisture Vapor Emission Control	5
092216	Non-Structural Metal Framing	8
092900	Gypsum Board	10
093000	Tiling	10
095113	Acoustical Panel Ceilings	9
096513	Resilient Base and Accessories	4
096519	Resilient Tile Flooring	5
096723	Resinous Flooring	6
096813	Tile Carpeting	6
099123	Interior Painting	14
099600	High-Performance Coatings	6

DIVISION 10 - SPECIALTIES

101400	Code Required Signage	11
--------	-----------------------	----

102123	Cubicle Curtains and Track	3
102600	Wall and Door Protection	8
102800	Toilet, Bath, and Laundry Accessories	5
104313	Defibrillator Cabinets	4
104413	Fire Protection Cabinets	5
104416	Fire Extinguishers	3
105126	Solid Phenolic Lockers	5
DIVISION 12 - FURNISHINGS		
123530	Residential Casework	5
<u>VOLUME 2</u>		
000101	Project Manual Cover	1
000107	Professional Seals and Certifications	1
000110	Table of Contents	5
DIVISION 21 – FIRE SUPPRESSION		
210500	Common Work Results for Fire Suppression	14
210548	Vibration and Seismic Controls for Fire-Suppression Piping and Equipment	11
211000	Water-Based Fire Suppression Systems	40
DIVISION 22 - PLUMBING		
220500	Common Work Results for Plumbing	24
220513	Common Motor Requirements for Plumbing Equipment	5
220517	Sleeves and Sleeve Seals for Plumbing Piping	6
220519	Meters and Gages for Plumbing Piping	19
220523	General Duty Valves for Plumbing Piping	26
220529	Hangers and Supports for Plumbing Piping and Equipment	19
220548	Vibration and Seismic Controls for Plumbing Piping and Equipment	16
220553	Identification for Plumbing Piping and Equipment	10
220700	Plumbing Insulation	31
221116	Domestic Water Piping	13
221119	Domestic Water Piping Specialties	12
221316	Sanitary Waste, Vent and Storm Piping	23
221319	Sanitary Waste and Storm Piping Specialties	16
224000	Plumbing Fixtures	23
DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING		
230030	Electrical Requirements for Mechanical Equipment	4
230050	Basic Mechanical Materials and Methods	4
230130	HVAC Air Duct Cleaning	14
230131	HVAC Air Distribution System Cleaning	9
230500	Common Work Results for HVAC	19
230513	Common Motor Requirements for HVAC Equipment	7
230516	Expansion Fittings and Loops for HVAC Piping	7
230517	Sleeves and Sleeve Seals for HVAC Piping	5
230518	Escutcheons for HVAC Piping	4
230519	Meters and Gages for HVAC Piping	9
230523	General Duty Valves for HVAC Piping (Short Form)	6
230529	Hangers and Supports for HVAC Piping and Equipment	14
230548	Vibration, Seismic and Wind Controls for HVAC	18
230553	Identification for HVAC Piping and Equipment	11
230593	Testing, Adjusting, and Balancing for HVAC	34
230700	HVAC Insulation	13
230900	Instrumentation and Control for HVAC	48
232113	Hydronic Piping	12
232116	Hydronic Piping Specialties	7
233113	Metal Ducts	13
233300	Air Duct Accessories	14
233416	Centrifugal HVAC Fans	6
233713	Diffusers, Registers, and Grilles	4
237413	Packaged Outdoor Central-Station Air-Handling Units	10
238219	Fan Coil Units	7

DIVISION 26 – ELECTRICAL

260011	Selective Removals, Relocations, and Rearrangements	6
260500	Common Work Results for Electrical	12
260505	Electrical Inspections and Testing	16
260519	Low Voltage Electrical Power Conductors and Cables (100-600 Volts)	9
260526	Grounding and Bonding	13
260529	Hangers and Supports	8
260533	Raceways	12
260535	Boxes and Cabinets	11
260544	Sleeves and Sleeve Seals for Raceways and Cabling	5
260548	Vibration and Seismic Controls	10
260553	Electrical Identification	18
260575	Conduit Rough-In Systems	11
260578	Multi-Service Boxes and Assemblies	23
262726	Wiring Devices	14
262800	Protective Devices	14
265100	Interior Lighting	29

DIVISION 27 - COMMUNICATIONS

270011	Selective Removals, Relocations and Rearrangements	3
270500	Common Work Results for Communications	26
270526	Grounding and Bonding for Communications Systems	14
271000	Structured Telecommunications Cabling Systems	37
275223	Nurse Call Systems	17

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

280011	Selective Removals, Relocations and Rearrangements	3
280500	Common Work Results for Electronic Safety and Security	24
283105	Fire Alarm System Extension	10

END OF SECTION 000110

SECTION 000115 – LIST OF DRAWINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section provides a comprehensive list of the drawings that comprise the Bid Documents for this project.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 LIST OF DRAWINGS

- A. The following list of drawings is a part of the Bid Documents:

	<u>TITLE</u>	<u>SHEET #</u>	<u>DATE</u>
1.	COVER SHEET	G-001	06/26/25
2.	DRAWING INDEX	G-002	06/26/25
3.	SYMBOLS & ABBREVIATIONS	G-003	06/26/25
4.	CODE COMPLIANCE – OVERALL	G-100	06/26/25
5.	CODE COMPLIANCE – A WING	G-101	06/26/25
6.	MOUNTING HEIGHTS	A-001	06/26/25
7.	CASEWORK STANDARDS	A-002	06/26/25
8.	DEMOLITION PLANS – CENTRAL FACILITIES	A-011	06/26/25
9.	DEMOLITION PLANS – A WING	A-012	06/26/25
10.	DEMOLITION RCP – A WING	A-016	06/26/25
11.	FLOOR PLAN – OVERALL	A-100	06/26/25
12.	FLOOR PLANS – CENTRAL FACILITIES	A-102	06/26/25
13.	FLOOR PLAN – A HOME 1	A-103	06/26/25
14.	FLOOR PLAN – A HOME 2	A-104	06/26/25
15.	FLOOR PLAN – A NBHD CTR 1	A-105	06/26/25

16.	FLOOR PLAN – A NBHD CTR 2	A-106	06/26/25
17.	ROOF PLAN – OVERALL	A-112	06/26/25
18.	SLOPE DIAGRAMS	A-201	06/26/25
19.	INTERIOR ELEVATIONS – A WING	A-202	06/26/25
20.	BUILDING SECTIONS	A-300	06/26/25
21.	INTERIOR DETAILS	A-503	06/26/25
22.	CEILING DETAILS	A-504	06/26/25
23.	CASEWORK DETAILS	A-505	06/26/25
24.	PARTITION TYPES	A-600	06/26/25
25.	PARTITION TYPES	A-601	06/26/25
26.	DOORS & BORROWED LIGHTS	A-602	06/26/25
27.	DOOR SCHEDULES FOR A-WING	A-603	06/26/25
28.	RCP – A HOME 1	A-702	06/26/25
29.	RCP – A HOME 2	A-703	06/26/25
30.	RCP – A WING NBHD CTR 1	A-704	06/26/25
31.	RCP – A WING NBHD CTR 2	A-705	06/26/25
32.	WALL PROTECTION & FLOOR TRANSITIONS	A-821	06/26/25
33.	GENERAL NOTES AND FINISH LEGEND	I-001	06/26/25
34.	FINISH PLAN – CENTRAL FACILITIES	I-100	06/26/25
35.	FINISH PLAN – A HOME 1	I-102	06/26/25
36.	FINISH PLAN – A HOME 2	I-103	06/26/25
37.	FINISH PLAN – A NBHD CTR 1	I-104	06/26/25
38.	FINISH PLAN – A NBHD CTR 2	I-105	06/26/25
39.	WALL PROTECTION – CENTRAL FACILITIES	I-111	06/26/25
40.	WALL PROTECTION PLAN – A HOME 1	I-113	06/26/25
41.	WALL PROTECTION PLAN – A HOME 2	I-114	06/26/25
42.	WALL PROTECTION PLAN – A NBHD CTR 1	I-115	06/26/25
43.	WALL PROTECTION PLAN – A NBHD CTR 2	I-116	06/26/25
44.	GENERAL NOTES AND ABBREVIATIONS	S-001	06/26/25
45.	GENERAL NOTES AND ABBREVIATIONS	S-002	06/26/25
46.	LEVEL 01 A WINGS FOUNDATION PLAN	S-101A	06/26/25

47.	TYPICAL FOUNDATION DETAILS	S-301	06/26/25
48.	TYPICAL STEEL FRAMED DETAILS	S-501	06/26/25
49.	TYPICAL WOOD DETAILS	S-601	06/26/25
50.	LEGENDS, SYMBOLS & ABBREVIATIONS	F-001	06/26/25
51.	LEVEL 01 FIRE PROTECTION DEMOLITION PLAN – A WING	F-003	06/26/25
52.	LEVEL 01 FIRE PROTECTION PLAN – A WING	F-102	06/26/25
53.	LEGENDS, SYMBOLS AND ABBREVIATIONS	P-001	06/26/25
54.	UNDERFLOOR PLUMBING DEMOLITION PLAN – A WING	P-002	06/26/25
55.	LEVEL 01 PLUMBING DEMOLITION PLAN – A WING	P-004	06/26/25
56.	UNDERFLOOR PLUMBING PLAN - A WING	P-101	06/26/25
57.	LEVEL 01 PLUMBING PLAN – A WING	P-103	06/26/25
58.	PLUMBING ISOMETRIC DIAGRAMS	P-401	06/26/25
59.	PLUMBING ISOMETRIC DIAGRAMS	P-402	06/26/25
60.	PLUMBING ISOMETRIC DIAGRAMS	P-403	06/26/25
61.	PLUMBING ISOMETRIC DIAGRAMS	P-404	06/26/25
62.	PLUMBING SCHEDULES	P-501	06/26/25
63.	DEMO NOTES, SYMBOLS, AND ABBREVIATIONS	M-001	06/26/25
64.	SEISMIC CODE BLOCK AND GENERAL NOTES	M-002	06/26/25
65.	LEVEL 01 DUCTWORK DEMOLITION PLAN – A WING	M-003	06/26/25
66.	LEVEL 01 PIPING DEMOLITION PLAN – A WING	M-004	06/26/25
67.	LEVEL 01 DUCTWORK PLAN – A WING	M-103	06/26/25
68.	LEVEL 01 DUCTWORK PLAN – A1B ISOLATION WING	M-103A	06/26/25
69.	LEVEL 01 HVAC PIPING PLAN – A WING	M-104	06/26/25
70.	DETAILS	M-501	06/26/25
71.	SCHEDULES	M-601	06/26/25
72.	DETAILS AND CONTROL DIAGRAMS	M-602	06/26/25

73.	AHU CONTROL DIAGRAMS	M-603	06/26/25
74.	AIR AND WATER FLOW DIAGRAMS	M-604	06/26/25
75.	AIR AND WATER FLOW DIAGRAMS	M-605	06/26/25
76.	NOTES, LEGENDS, SYMBOLS AND ABBREVIATIONS	E-001	06/26/25
77.	NOTES, LEGENDS, SYMBOLS AND ABBREVIATIONS	E-002	06/26/25
78.	LEVEL 01 DEMOLITION PLAN – A WING	E-003	06/26/25
79.	ELECTRICAL SITE PLAN	E-101	06/26/25
80.	LEVEL 01 LIGHTING PLAN – A WING	E-102	06/26/25
81.	LEVEL 01 POWER PLAN – A WING	E-103	06/26/25
82.	LEVEL 01 SYSTEMS PLAN – A WING	E-104	06/26/25
83.	ENLARGED PLANS	E-401	06/26/25
84.	SYSTEMS DETAILS	E-501	06/26/25
85.	SYSTEMS DETAILS	E-502	06/26/25
86.	FIRE ALARM RISER DIAGRAMS	E-601	06/26/25
87.	NORMAL POWER SINGLE LINE DIAGRAM	E-602	06/26/25
88.	EMERGENCY POWER SINGLE LINE DIAGRAM	E-603	06/26/25
89.	POWER SCHEDULES	E-604	06/26/25
90.	POWER SCHEDULES	E-605	06/26/25
91.	POWER SCHEDULES	E-606	06/26/25
92.	LIGHTING FIXTURE SCHEDULE	E-607	06/26/25
93.	LEVEL 01 POWER PLAN-A1A ISOLATION WING	E-103A	06/26/25

END OF SECTION 000115

SECTION 001116 - INVITATION FOR BID

1.0 OWNER:

- A. The State of Missouri
Office of Administration,
Division of Facilities Management, Design and Construction
Jefferson City, Missouri

2.0 PROJECT TITLE AND NUMBER:

- A. Interior Renovations, A Wing
St Louis Veterans Home
St. Louis, Missouri
Project No.: U2307-01

3.0 BIDS WILL BE RECEIVED:

- A. Until: 1:30 PM, August 26, 2025
- B. **Only electronic bids sent to FMDCBids@oa.mo.gov shall be accepted:** (See Instructions to Bidders for further detail)

4.0 DESCRIPTION:

- A. Scope: The project includes the interior renovation of the existing facility in the A-Wing of a veteran's home.
- B. MBE/WBE/SDVE Goals: MBE 10%, WBE 10%, and SDVE 3%. **NOTE: Only MBE/WBE firms certified by the State of Missouri Office of Equal Opportunity as of the date of bid opening, or SDVE(s) meeting the requirements of Section 34.074, RSMo and 1 CSR 30-5.010, can be used to satisfy the MBE/WBE/SDVE participation goals for this project.**

5.0 PRE-BID MEETING:

- A. Place/Time: 11:30 AM, August, 11, 2025, at St Louis Veterans Home, 10600 Lewis and Clark Boulevard, St. Louis, Mo 63136
- B. Access to State of Missouri property requires presentation of a photo ID by all persons

6.0 HOW TO GET PLANS & SPECIFICATIONS:

- A. View Only Electronic bid sets are available at no cost or paper bid sets for a **deposit of \$200.00** from American Document Solutions (ADS). MAKE CHECKS PAYABLE TO: American Document Solutions. Mail to: American Document Solutions, 1400 Forum Blvd., Suite 7A, Columbia, Missouri 65203. Phone 573-446-7768, Fax 573-355-5433, <https://www.adsplanroom.net>. NOTE: Prime contractors will be allowed a maximum of two bid sets at the deposit rate shown above. Other requesters will be allowed only one bid set at this rate. Additional bid sets or parts thereof may be obtained by any bidder at the cost of printing and shipping by request to American Document Solutions at the address shown above. Bidder must secure at least one bid set to become a planholder.
- B. **Refunds: Return plans and specifications in unmarked condition within 15 working days of bid opening to American Document Solutions, 1400 Forum Blvd., Suite 7A, Columbia, Missouri 65203. Phone 573-446-7768, Fax 573-355-5433. Deposits for plans not returned within 15 working days shall be forfeited.**
- C. Information for upcoming bids, including downloadable plans, specifications, Invitation for Bid, bid tabulation, award, addenda, and access to the ADS planholders list, is available on the Division of Facilities Management, Design and Construction's web site: <https://oa.mo.gov/facilities/bid-opportunities/bid-listing-electronic-plans>.

7.0 POINT OF CONTACT:

- A. Designer: CannonDesign, Amy Phillips, AIA, NCARB, LEED AP, 314-425-8716, email: aphillips@CANNONDESIGN.COM
- B. Project Manager: Fred L. Decker Jr, 573-751-8521, email: Fred.Decker@oa.mo.gov

8.0 GENERAL INFORMATION:

- A. The State reserves the right to reject any and all bids and to waive all informalities in bids. No bid may be withdrawn for a period of 20 working days subsequent to the specified bid opening time. The contractor shall pay not less than the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed, as determined by the Missouri Department of Labor and Industrial Relations and as set out in the detailed plans and specifications.
- B. Bid results will be available at <https://oa.mo.gov/facilities/bid-opportunities/bid-listing-electronic-plans> after it is verified that at least one bid is awardable and affordable.
- C. This is a federally funded/assisted construction project that requires compliance by the awarded contractor with applicable federal laws and regulations. The Bidder should review Section 007333, SUPPLEMENTARY GENERAL CONDITIONS FOR FEDERALLYFUNDED/ASSISTED CONSTRUCTION PROJECTS, which is made part of this solicitation and will made part of the resulting contract by reference.
- D. The State of Missouri, OA-FMDC, hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to this advertisement, businesses owned and controlled by socially and economically disadvantaged individuals will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, religion, creed, sex, age, ancestry or national origin in consideration for an award.

SECTION 002113 – INSTRUCTIONS TO BIDDERS

1.0 - SPECIAL NOTICE TO BIDDERS

- A. If awarded a contract, the Bidder's employees, and the employees of all subcontractors, who perform the work on the project must adhere to requirements in Section 013513 – Site Security and Health Requirements as applicable per Agency.
- B. The Bidder's prices shall include all city, state, and federal sales, excise, and similar taxes that may lawfully be assessed in connection with the performance of work, and the purchased of materials to be incorporated in the work. **THIS PROJECT IS NOT TAX EXEMPT.**

2.0 - BID DOCUMENTS

- A. The number of sets obtainable by one (1) party may be limited in accordance with available supply.
- B. For the convenience of contractors, subcontractors and suppliers, bidding documents are available on the Owner's website at <https://oa.mo.gov/facilities/bid-opportunities/bid-listing-electronic-plans>.

3.0 - BIDDERS' OBLIGATIONS

- A. Bidders must carefully examine the entire site of the work and shall make all reasonable and necessary investigations to inform themselves thoroughly as to the facilities available as well as to all the difficulties involved in the completion of all work in accordance with the specifications and the plans. Bidders are required to examine all maps, plans and data mentioned in the specifications. No plea of ignorance concerning observable existing conditions or difficulties that may be encountered in the execution of the work under this contract will be accepted as an excuse for any failure or omission on the part of the successful Bidder (contractor) to fulfill every detail of the requirements of the contract, nor accepted as a basis for any claims for extra compensation or time extension.
- B. Under no circumstances will Bidders give their plans and specifications to other Bidders. It is highly encouraged, but not required, that all Bidders be on the official planholders list to receive project updates including but not limited to any addenda that are issued during the bidding process.

4.0 - INTERPRETATIONS

- A. No Bidder shall be entitled to rely on oral or written representations from any person as to the meaning of the plans and specifications or the acceptability of alternate products, materials, form or type of construction.
- B. Bidders shall make all requests for interpretations in writing and submit all requests to the Project Designer and Project Manager identified in Section 007300 – Supplementary Conditions with all necessary supporting documentation no less than five (5) working days before opening of bids. Responses to requests for interpretation will be issued via a written addendum and will be sent as promptly as is practicable to all official planholders and posted on the Owner's website. All such addenda shall become part of the bid and contract documents.
- C. Bidders shall make all requests for an "Acceptable Substitution" on the Section 006325 Substitution Request Form. The request shall be emailed to the Project Designer and Project Manager identified in Section 007300 – Supplementary Conditions no less than five (5) working days before opening of bids. Responses to requests for substitutions will be issued via a written addendum and will be sent as promptly as is practicable to all official planholders and posted on the Owner's website. All such addenda shall become part of the bid and contract documents.
- D. An "Acceptable Substitution" requested after the award of bid will only be approved if proven to the satisfaction of the Owner and the Designer that the product is acceptable in design, strength, durability, usefulness, and convenience for the purpose intended. Approval of the substitution after award is at the sole discretion of the Owner and all requests of this nature must be submitted in accordance with Article 3.1 of the General Conditions.

5.0 - BIDS AND BIDDING PROCEDURE

- A. Bidders shall submit all submission forms and accompanying documents listed in Section 004113 – Bid Form, Article 5.0, Attachments to Bid by the stated time on the bid documents or the bid will be rejected for being non-responsive.
- B. Depending on the specific project requirements, **the following is a GENERIC list** of all possible bid forms that may be due with bid submittals. Bidders must verify each specific project's requirements in Section 004113 to ensure they have provided all the required documentation with their submission.

Bid Submittal – due before stated date and time of bid opening (see IFB):

004113	Bid Form (all pages are always required)
004322	Unit Prices Form
004336	Proposed Subcontractors Form
004337	MBE/WBE/SDVE Compliance Evaluation Form
004338	MBE/WBE/SDVE Eligibility Determination for Joint Ventures
004339	MBE/WBE/SDVE GFE Determination
004340	SDVE Business Form
004541	Affidavit of Work Authorization
004545	Anti-Discrimination Against Israel Act Certification form

- C. The Bidder shall submit its bid on the forms provided by the Owner in the same file format (PDF) with each space fully and properly completed, typewritten or legibly printed, including all amounts required for alternate bids, unit prices, cost accounting data, etc. The Owner will reject bids that are not on the Owner's forms or that do not contain all requested information. All forms can be found on the Owner's website at <https://oa.mo.gov/facilities/bid-opportunities/bid-listing-electronic-plans> and shall be submitted with your bid to FMDCBids@oa.mo.gov.
- D. All bids shall be submitted without additional terms and conditions, modifications, or reservations. The completed forms should not include interlineations, alterations, or erasures. Bids not in compliance with the requirements of this paragraph will be rejected as non-responsive.
- E. All bids shall be accompanied by a bid bond executed by the bidder and a duly authorized surety company, certified check, cashier's check or bank draft made payable to the Division of Facilities Management, Design and Construction, State of Missouri, in the amount indicated in the bid documents in Section 004113. Failure of the Bidder to submit the duly authorized bid bond or the full amount required shall be sufficient cause to reject his bid. The Bidder agrees that the proceeds of the check, draft, or bond shall become the property of the State of Missouri, if for any reason the Bidder withdraws his bid after bid closing or if the Bidder, within ten (10) working days after notification of award, refuses or is unable to 1) execute the tendered contract, 2) provide an acceptable performance and payment bond, or 3) provide evidence of required insurance coverage.
- F. The bid bond check or draft submitted by the successful Bidder will be returned after the receipt of an acceptable performance and payment bond and execution of the formal contract. Checks or drafts of all other Bidders will be returned within a reasonable time after it is determined that the bid represented by same will receive no further consideration by the State of Missouri.

6.0 - SIGNING OF BIDS

- A. A bid should contain the full and correct legal name of the Bidder. If the Bidder is an entity registered with the Missouri Secretary of State, the Bidder's name on the bid form should appear as shown in the Secretary of State's records. If the Bidder is an entity organized in a state other than Missouri, the Bidder must provide a Certificate of Authority to do business in the State of Missouri.
- B. If the successful Bidder is doing business in the State of Missouri under a fictitious name, the Bidder shall furnish to Owner, attached to the Bid Form, a properly certified copy of the certificate of Registration of Fictitious Name from the State of Missouri, and such certificate shall remain on file with the Owner.
- C. A bid from an individual shall be signed as noted on the Bid Form.
- D. A bid from a partnership or joint venture shall require only one signature of a partner, an officer of the joint venture authorized to bind the venture, or an attorney-in-fact. If the bid is signed by an officer of

a joint venture or an attorney-in-fact, a document evidencing the individual's authority to execute contracts should be included with the bid form.

- E. A bid from a limited liability company (LLC) shall be signed by a manager or a managing member of the LLC.
- F. A bid from a corporation shall have the correct corporate name thereon and the signature of an authorized officer of the corporation. Title of office held by the person signing for the corporation shall appear, along with typed name of said individual and the corporate license number shall be provided. In addition, for corporate proposals, the President or Vice-President listed per the current filing with the Missouri Secretary of State should sign as the Bidder. If the signatory is other than the corporate president or vice president, the bidder must provide satisfactory evidence that the signatory has the legal authority to bind the corporation.

7.0 - RECEIVING BID SUBMITTALS

- A. It is the Bidder's sole responsibility to ensure receipt of the bid submittals by Owner on or before the date and time specified in the Invitation for Bid or as modified via written addenda. Bids received after the date and time specified will not be considered by the Owner.
- B. All bids shall be received via email at FMDCBids@oa.mo.gov and bids received by the Owner through any other means, including hard copies, will not be considered, and will be discarded by the Owner unopened.

8.0 - MODIFICATION AND WITHDRAWAL OF BIDS

- A. Bidder may withdraw a bid at any time prior to the scheduled closing time for receipt of bids, but no bidder may withdraw his bid for a period of twenty (20) working days after the scheduled closing time for receipt of bids.
- B. Bidder may modify a bid until the scheduled closing time by sending a revised bid to FMDCBids@oa.mo.gov with a note in the subject line and body of the email that it is a revised bid. All revised bids must be submitted to FMDCBids@oa.mo.gov, revised bids sent any other way will not be considered.

9.0 - AWARD OF CONTRACT

- A. The Owner reserves the right to reject any and/or all bids and further to waive all informalities in bidding when deemed in the best interest of the State of Missouri.
- B. The Owner reserves the right to let other contracts in connection with the work including, but not limited to, contracts for the furnishing and installation of furniture, equipment, machinery, appliances and other apparatuses.
- C. The Owner will award a contract to the lowest, responsive, and responsible Bidder in accordance with Section 8.250, RSMo. No contract will be awarded to any Bidder who has had a contract with the Owner terminated within the preceding twelve months for material breach of contract or who has been suspended or debarred by the Owner.
- D. Award of alternates, if any, will be made in numerical order unless all bids received are such that the order of acceptance of alternates does not affect the determination of the lowest, responsive, responsible bidder.
- E. No award shall be considered binding upon the Owner until the written contract has been properly executed and the following documentation has been provided: 1) performance and payment bond consistent with Article 6.1 of the General Conditions; 2) proof of the required insurance coverage; 3) an executed Section 004541 - Affidavit of Work Authorization form; and 4) documentation evidence enrollment and participation in a federal work authorization program.
- F. Failure to execute and return the contract and associated documents within the prescribed period shall be treated, at the option of the Owner, as a breach of Bidder's obligation and the Owner shall be under no further obligation to Bidder.
- G. Transient employers subject to Sections 285.230 and 285.234, RSMo, (out-of-state employers who temporarily transact any business in the State of Missouri) may be required to file a bond with the

Missouri Department of Revenue. No contract will be awarded by the Owner unless the successful Bidder certifies that he has complied with all applicable provisions of Section 285.230-234.

- H. Sections 285.525 and 285.530, RSMo, require business entities to enroll and participate in a federal work authorization program in order to be eligible to receive award of any state contract in excess of \$5,000. Bidders should submit with their bid an Affidavit of Work Authorization (Section 004541) along with appropriate documentation evidencing such enrollment and participation. Bidders must also submit an E-Verify Memorandum before the Owner may award a contract to the Bidder. Information regarding a E-Verify is located at <https://www.e-verify.gov/employers/enrolling-in-e-verify>. The contractor shall be responsible for ensuring that all subcontractors and suppliers associated with this contract enroll in E-Verify.
- I. The successful Bidder must be registered in MissouriBUYS powered by MOVERS at <https://missouribuyss.mo.gov/supplier-registration#> as an approved vendor prior to being issued a contract.

10.0 - CONTRACT SECURITY

- A. The successful Bidder shall furnish a performance/payment bond as set forth in General Conditions Article 6.1 prior to the State executing the contract and issuing a notice to proceed.

11.0 - LIST OF SUBCONTRACTORS

- A. If required by "Section 004113 – Bid Form," each Bidder must submit as part of their bid a list of subcontractors to be used in performing the work (Section 004336). The list must specify the name of the single designated subcontractor, manufacturer, or suppliers for each category of work listed in "Section 004336 - Proposed Subcontractors Form." If work within a category will be performed by more than one subcontractor, the bidder must provide the name of each subcontractor and specify the exact portion of the work to be done by each. If the Bidder intends to perform any of the designated subcontract work with the use of his own employees, the Bidder shall make that fact clear, by listing his own firm for the subject category. **If any category of work is left vacant or if more than one subcontractor is listed for any category without designating the portion of work to be performed by each, the bid shall be rejected.**

12.0 - WORKING DAYS

- A. Contract duration time is stated in working days and will use the following definition in determining the actual calendar date for contract completion:
 - 1. Working days are defined as all calendar days except Saturdays, Sundays and the following State of Missouri observed holidays: New Year's Day, Martin Luther King, Jr. Day, Lincoln Day, Washington's Birthday, Truman Day, Memorial Day, Juneteenth, Independence Day, Labor Day, Columbus Day, Veterans Day, Thanksgiving Day and Christmas Day.

13.0 - AMERICAN AND MISSOURI - MADE PRODUCTS AND FIRMS

- A. By signing the bid form and submitting a bid on this project, the Bidder certifies that it will use American and Missouri products as set forth in Article 1.7 of the General Conditions. Bidders are advised to review those requirements carefully prior to bidding.
- B. A preference shall be given to Missouri firms, corporations or individuals, or firms, corporations or individuals that maintain Missouri offices or places of business, when the quality of performance promised is equal or better and the price quoted is the same or less.
- C. Pursuant to Section 34.076, RSMo, a contractor or Bidder domiciled outside the boundaries of the State of Missouri shall be required, in order to be successful, to submit a bid the same percent less than the lowest bid submitted by a responsible contractor or Bidder domiciled in Missouri as would be required for such a Missouri domiciled contractor or Bidder to succeed over the bidding contractor or Bidder domiciled outside Missouri on a like contract or bid being let in the Bidder's domiciliary state and, further, the contractor or Bidder domiciled outside the boundaries of Missouri shall be required to submit an audited financial statement as would be required of a Missouri domiciled contractor or Bidder on a like contract or bid being let in the domiciliary state of that contractor or Bidder.

14.0 – ANTI-DISCRIMINATION AGAINST ISRAEL ACT CERTIFICATION:

- A. If the Bidder meets the section 34.600, RSMo., definition of a “company” and the Bidder has ten or more employees, the Bidder must certify in writing that the Bidder is not currently engaged in a boycott of goods or services from the State of Israel and shall not engage in a boycott of goods or services from the State of Israel, if awarded a contract, for the duration of the contract. The Bidder is required to complete and submit the applicable portion of Section 004545 - Anti-Discrimination Against Israel Act Certification with its Bid Form. The applicable portion of the exhibit must be submitted prior to execution of a contract by the Owner and issuance of Notice to Proceed.

15.0 – MBE/WBE/SDVE INSTRUCTIONS

A. Definitions:

1. **“MBE”** means a Minority Business Enterprise.
2. **“MINORITY”** has the same meaning as set forth in 1 C.S.R. 10-17.010.
3. **“MINORITY BUSINESS ENTERPRISE”** has the same meaning as set forth in section 37.020, RSMo.
4. **“WBE”** means a Women’s Business Enterprise.
5. **“WOMEN’S BUSINESS ENTERPRISE”** has the same meaning as set forth in section 37.020, RSMo.
6. **“SDVE”** means a Service-Disabled Veterans Enterprise.
7. **“SERVICE-DISABLED VETERAN”** has the same meaning as set forth in section 34.074, RSMo.
8. **“SERVICE-DISABLED VETERAN ENTERPRISE”** has the same meaning as “Service-Disabled Veteran Business” set forth in section 34.074, RSMo.

B. MBE/WBE/SDVE General Requirements:

1. For all bids greater than \$100,000, the Bidder shall obtain MBE, WBE and SDVE participation in an amount equal to or greater than the percentage goals set forth in the Invitation for Bid and the Bid Form, unless the Bidder is granted a Good Faith Effort waiver by the Director of the Division, as set forth below. If the Bidder does not meet the MBE, WBE and SDVE goals, or make a good faith effort to do so, the Bidder shall be nonresponsive, and its bid shall be rejected.
2. The Bidder should submit with its bid all the information requested in the MBE/WBE/SDVE Compliance Evaluation Form for every MBE, WBE, or SDVE subcontractor or material supplier the Bidder intends to use for the contract work. The Bidder is required to submit all MBE/WBE/SDVE documentation before the stated time and date set forth in the Invitation for Bid. If the Bidder fails to provide such information by the specified date and time, the Owner shall reject the bid.
3. The Director reserves the right to request additional information from a Bidder to clarify the Bidder’s proposed MBE, WBE, and/or SDVE participation. The Bidder shall submit the clarifying information requested by the Owner within two (2) working days of receiving the request for clarification.
4. Pursuant to section 34.074, RSMo, a Prime Bidder that qualifies as an SDVE shall receive a three-percentage point bonus preference in the contract award evaluation process. The bonus preference will be calculated and applied by reducing the bid amount of the eligible SDVE by three percent of the apparent low responsive Bidder’s bid. Based on this calculation, if the eligible SDVE’s evaluation is less than the apparent low responsive Bidder’s bid, the eligible SDVE’s bid will become the apparent low responsive bid. This reduction is for evaluation purposes only and will have no impact on the actual amount(s) of the bid or the amount(s) of any contract awarded. In order to be eligible for the SDVE preference, the Bidder must complete and submit with its bid the Missouri Service-Disabled Veteran Business Form, and any information required by the form.

C. Computation of MBE/WBE/SDVE Goal Participation:

1. A Bidder who is a MBE, WBE, or SDVE may count 100% of the contract towards the MBE, WBE or SDVE goal, less any amounts awarded to another MBE, WBE or SDVE. (NOTE: a MBE firm that bids as general contractor must obtain WBE and SDVE participation; a WBE firm that bids as

a general contractor must obtain MBE and SDVE participation; and a SDVE firm that bids as general contractor must obtain MBE and WBE participation.) For the remaining contract amount to be counted towards the MBE, WBE or SDVE goal, the Bidder must complete the MBE/WBE/SDVE Compliance Evaluation Form (Section 004337) identifying itself as an MBE, WBE or SDVE.

2. The total dollar value of the work granted to a certified MBE, WBE or SDVE by the Bidder shall be counted towards the applicable goal.
3. Expenditures for materials and supplies obtained from a certified MBE, WBE, or SDVE supplier or manufacturer may be counted towards the MBE, WBE and SDVE goals, if the MBE, WBE, or SDVE assumes the actual and contractual responsibility for the provision of the materials and supplies.
4. The total dollar value of the work granted to a second or subsequent tier subcontractor or a supplier may be counted towards a Bidder's MBE, WBE and SDVE goals, if the MBE, WBE, or SDVE properly assumes the actual and contractual responsibility for the work.
5. The total dollar value of work granted to a certified joint venture equal to the percentage of the ownership and control of the MBE, WBE, or SDVE partner in the joint venture may be counted towards the MBE/WBE/SDVE goals.
6. Only expenditures to a MBE, WBE, or SDVE that performs a commercially useful function in the work may be counted towards the MBE, WBE and SDVE goals. A MBE, WBE, or SDVE performs a commercially useful function when it is responsible for executing a distinct element of the work and carrying out its responsibilities by performing, managing and supervising the work or providing supplies or manufactured materials.

D. Certification of MBE/WBE/SDVE Subcontractors:

1. In order to be counted towards the goals, an MBE or WBE must be certified by the State of Missouri Office of Equal Opportunity and an SDVE must be certified by the State of Missouri, Office of Equal Opportunity or by the Federal U.S. Small Business Administration directory.
2. The Bidder may determine the certification status of a proposed MBE or WBE subcontractor or supplier by referring to the Office of Equal Opportunity (OEO)'s online MBE/WBE directory <https://apps1.mo.gov/MWBCertifiedFirms/>. The Bidder may determine the eligibility of a SDVE subcontractor or supplier by referring to the Office of Equal Opportunity online SDVE directory at <https://oeo.mo.gov/sdve-certification-program/> or the Federal U.S. Small Business Administration directory <https://veterans.certify.sba.gov/#search>.
3. Additional information, clarifications, or other information regarding the MBE/WBE/SDVE listings in the directories may be obtained by contacting the Contract Specialist of record as shown in the Supplementary Conditions (Section 007300).

E. Waiver of MBE/WBE/SDVE Participation:

1. If a Bidder has made a good faith effort to secure the required MBE, WBE and/or SDVE participation and has failed, the Bidder shall submit with its bid the information requested in MBE/WBE/SDVE Good Faith Effort (GFE) Determination form. The Director will determine if the Bidder made a good faith effort to meet the applicable goals. If the Director determines that the Bidder did not make a good faith effort, the bid shall be rejected as being nonresponsive to the bid requirements. Bidders who demonstrate that they have made a good faith effort to include MBE, WBE, and/or SDVE participation will be granted a waiver and will be considered to be responsive to the applicable participation goals, regardless of the percent of actual participation obtained, if the bid is otherwise acceptable.
2. In determining whether a Bidder has made a good faith effort to obtain MBE, WBE and/or SDVE participation, the Director may evaluate the factors set forth in 1 CSR 30-5.010(6)(C) and the following:
 - a. The amount of actual participation obtained;

- b. How and when the Bidder contacted potential MBE, WBE, and SDVE subcontractors and suppliers;
- c. The documentation provided by the Bidder to support its contacts, including whether the Bidder provided the names, addresses, phone numbers, and dates of contact for MBE/WBE/SDVE firms contacted for specific categories of work;
- d. If project information, including plans and specifications, were provided to MBE/WBE/SDVE subcontractors;
- e. Whether the Bidder made any attempts to follow-up with MBE, WBE or SDVE firms prior to bid;
- f. Amount of bids received from any of the subcontractors and/or suppliers that the Bidder contacted;
- g. The Bidder's stated reasons for rejecting any bids;

F. Contractor MBE/WBE/SDVE Obligations

- 1. If awarded a contract, the Bidder will be contractually required to subcontract with or obtain materials from the MBE, WBE, and SDVE firms listed in its bid, in amounts equal to or greater than the dollar amount in the bid, unless the amount is modified in writing by the Owner.
- 2. If the Contractor fails to meet or maintain the participation requirements contained in the Contractor's bid, the Contractor must satisfactorily explain to the Director why it cannot comply with the requirement and why failing meeting the requirement was beyond the Contractor's control. If the Director finds the Contractor's explanation unsatisfactory, the Director may take any appropriate action including, but not limited to:
 - a. Declaring the Contractor ineligible to participate in any contracts with the Division for up to twelve (12) months (suspension); and/or
 - b. Declaring the Contractor be nonresponsive to the Invitation for Bid, or in breach of contract and rejecting the bid or terminating the contract.
- 3. If the Contractor replaces an MBE, WBE, or SDVE during the course of the contract, the Contractor shall replace it with another MBE, WBE, or SDVE or make a good faith effort to do so. All MBE, WBE and SDVE substitutions must be approved by the Director in writing.
- 4. The Contractor shall provide the Owner with regular reports on its progress in meeting its MBE/WBE/SDVE obligations. At a minimum, the Contractor shall report the dollar-value of work completed by each MBE, WBE, or SDVE during the preceding month and the cumulative total of work completed by each MBE, WBE or SDVE to date with each monthly application for payment. The Contractor shall also make a final report, which shall include the total dollar-value of work completed by each MBE, WBE, and SDVE during the entire contract.



State of Missouri Construction Contract

THIS AGREEMENT is made (DATE) by and between:

Contractor Name and Address

hereinafter called the "Contractor," and the **State of Missouri**, hereinafter called the "**Owner**", represented by the Office of Administration, Division of Facilities Management, Design and Construction.

WITNESSETH, that the Contractor and the Owner, for the consideration stated herein agree as follows:

ARTICLE 1. STATEMENT OF WORK

The Contractor shall furnish all labor and materials and perform all work required for furnishing and installing all labor, materials, equipment and transportation and everything necessarily inferred from the general nature and tendency of the plans and specifications for the proper execution of the work for:

Project Name: Interior Renovations, A Wing
St Louis Veterans Home
St. Louis, Missouri

Project Number: U2307-01

in strict accordance with the Contract Documents as enumerated in Article 7, all of which are made a part hereof.

ARTICLE 2. TIME OF COMPLETION

The contract performance time is **250 working days** from the transmittal date of this agreement. The contract completion date is **MONTH, DAY, YEAR**. This time includes ten (10) working days for the Contractor to receive, sign and return the contract form along with required bonding and insurance certificates. Failure of the Contractor to provide correct bonding and insurance within the ten (10) working days shall not be grounds for a time extension. Receipt of proper bonding and insurance is a condition precedent to the formation of the contract and if not timely received, may result in forfeiture of the Contractor's bid security. Work may not commence until the Owner issues a written Notice to Proceed and must commence within seven (7) working days thereafter.

ARTICLE 3. LIQUIDATED DAMAGES

Whenever time is mentioned in this contract, time shall be and is of the essence of this contract. The Owner would suffer a loss should the Contractor fail to have the work embraced in this contract fully completed on or before the time above specified. THEREFORE, the parties hereto realize in order to adjust satisfactorily the damages on account of such failure that it might be impossible to compute accurately or estimate the amount of such loss or damages which the Owner would sustain by reason of failure to complete fully said work within the time required by this contract. The Contractor hereby covenants and agrees to pay the Owner, as and for **liquidated damages, the sum of \$1,000** per day for each and every day, Sunday and legal holidays excepted, during which the work remains incomplete and unfinished. Any sum which may be due the Owner for such damages shall be deducted and retained by the Owner from any balance which may be due the Contractor when said work shall have been finished and accepted. But such provisions shall not release the Bond of the Contractor from liability according to its terms. In case of failure to complete, the Owner will be under no obligation to show or prove any actual or specific loss or damage.

ARTICLE 4. CONTRACT SUM

The Owner shall pay the Contractor for the prompt, faithful and efficient performance of the conditions and undertakings of this contract, subject to additions, and deductions as provided herein, in current funds the sum of:

Base Bid: \$

Accepted Alternates, if applicable to the Project and accepted by the Owner.

TOTAL CONTRACT AMOUNT: (\$CONTRACT AMOUNT)

UNIT PRICES: The Owner accepts the following Unit Prices:

For changing specified quantities of work from those indicated by the contract drawings and specifications, upon written instructions of Owner, the following unit prices shall prevail. The unit prices include all labor, overhead and profit, materials, equipment, appliances, bailing, shoring, shoring removal, etc., to cover the finished work of the several kinds of work called for. Only a single unit price shall be given and it shall apply for either MORE or LESS work than that shown on the drawings and called for in the specifications or included in the Base Bid. In the event of more or less units than so indicated or included, change orders may be issued for the increased or decreased amount.

ARTICLE 5. PREVAILING WAGE RATE

MISSOURI PREVAILING WAGE LAW (Sections 290.210 to 290.340, RSMo): The Contractor shall pay not less than the specified hourly rate of wages, as set out in the wage order attached to and made part of the specifications for work under this contract, to all workers performing work under the contract, in accordance with sections 290.210 to 290.340, RSMo. The Contractor shall forfeit a penalty to the Owner of one hundred dollars per day (or portion of a day) for each worker that is paid less than the specified rates for any work done under the contract by the Contractor or by any subcontractor, in accordance with section 290.250, RSMo.

DAVIS-BACON ACT: If this Project is financed in whole or in part from Federal funds (as indicated in the Instructions to Bidders or other bid or contract documents for this Project), then this contract shall be subject to all applicable federal labor statutes, rules and regulations, including provisions of the Davis-Bacon Act, 40 U.S.C. §3141 et seq., and the "Federal Labor Standards Provisions," as further set forth in Section 007333 – Supplementary General Conditions for Federally Funded/Assisted Construction Projects, which is incorporated into the contract by reference. Where the Missouri Prevailing Wage Law and the Davis-Bacon Act require payment of different wages for work performed under this contract, the Contractor and all Subcontractors shall pay the greater of the wages required under either law, on a classification-by-classification basis.

ARTICLE 6. MINORITY/WOMEN/SERVICE DISABLED VETERAN BUSINESS ENTERPRISE PARTICIPATION

The Contractor has been granted a waiver of the 10% MBE and 10% WBE and 3% SDVE participation goals. The Contractor agrees to secure the MBE/WBE/SDVE participation amounts for this project as follows: (OR)

The Contractor has met the MBE/WBE/SDVE participation goals and agrees to secure the MBE/WBE/SDVE participation amounts for this project as follows:

MBE/WBE/SDVE Firm:	Subcontract Amt:\$
MBE/WBE/SDVE Firm:	Subcontract Amt:\$
MBE/WBE/SDVE Firm:	Subcontract Amt:\$

Total \$

MBE/WBE/SDVE assignments identified above shall not be changed without a contract change signed by the Owner.

The Director of the Division of Facilities Management, Design and Construction or his Designee shall be the final authority to resolve disputes and disagreements between the Contractor and the MBE/WBE/SDVE firms listed above when such disputes impact the subcontract amounts shown above.

ARTICLE 7. CONTRACT DOCUMENTS

The following documents are hereby incorporated into this contract by reference (all division/section numbers and titles are as utilized in the Project Manual published by the Owner for this Project):

1. Division 0 – Procurement and Contracting Information, including, but not limited to:
 - a. Invitation for Bid (Section 001116)
 - b. Instructions to Bidders (Section 002113)
 - c. Supplementary Instructions to Bidders (if applicable) (Section 002213)
 - d. The following documents as completed and executed by the Contractor and accepted by the Owner, if applicable:
 - i. Bid Form (Section 004113)
 - ii. Unit Prices (Section 004322)
 - iii. Proposed Contractors Form (Section 004336)
 - iv. MBE, WBE, SDVE Compliance Evaluation Form(s) (Section 004337)
 - v. MBE, WBE, SDVE Eligibility Determination Form for Joint Ventures (Section 004338)
 - vi. MBE, WBE, SDVE Good Faith Effort (GFE) Determination Form (Section 004339)
 - vii. Missouri Service Disabled Veteran Business Form (Section 004340)
 - viii. Affidavit of Work Authorization (Section 004541)
 - ix. Affidavit for Affirmative Action (Section 005414), if applicable
 - e. Performance and Payment Bond, completed and executed by the Contractor and surety (Section 006113)
 - f. General Conditions (Section 007213)
 - g. Supplementary Conditions (Section 007300)
 - h. Supplementary General Conditions for Federally Funded/Assisted Construction Projects (Section 007333), if applicable
 - i. Wage Rate(s) (Section 007346)
2. Division 1 – General Requirements
3. All Drawings identified in the Project Manual
4. All Technical Specifications included in the Project Manual
5. Addenda, if applicable

ARTICLE 8 – CERTIFICATION

By signing this contract, the Contractor hereby re-certifies compliance with all legal requirements set forth in Section 6.0, Bidder's Certifications of the Bid Form.

By signature below, the parties hereby execute this contract document.

APPROVED:

Brian Yansen, Director
Division of Facilities Management,
Design and Construction

Contractor's Authorized Signature

I, Corporate Secretary, certify that I am Secretary of the corporation named above and that (CONTRACTOR NAME), who signed said contract on behalf of the corporation, was then (TITLE) of said corporation and that said contract was duly signed for and in behalf of the corporation by authority of its governing body, and is within the scope of its corporate powers.

Corporate Secretary

SECTION 006113 - PERFORMANCE AND PAYMENT BOND FORM

KNOW ALL MEN BY THESE PRESENTS, THAT we _____

as principal, and _____

_____ as Surety, are held and firmly bound unto the

STATE OF MISSOURI. in the sum of _____ Dollars (\$ _____)

for payment whereof the Principal and Surety bind themselves, their heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

WHEREAS, the Principal has, by means of a written agreement dated the _____

day of _____, 20_____, enter into a contract with the State of Missouri for

(Insert Project Title and Number)

NOW, THEREFORE, if the Principal shall faithfully perform and fulfill all the undertakings, covenants, terms, conditions and agreements of said contract during the original term of said contract and any extensions thereof that may be granted by the State of Missouri, with or without notice to the Surety and during the life of any guaranty required under the contract; and shall also faithfully perform and fulfill all undertakings, covenants, terms, conditions and agreements of any and all duly authorized modifications of said contract that may hereafter be made with or without notice to the Surety; and shall also promptly make payment for materials incorporated, consumed or used in connection with the work set forth in the contract referred to above, and all insurance premiums, both compensation and all other kinds of insurance, on said work, and for all labor performed on such work, whether by subcontractor or otherwise, at not less than the prevailing hourly rate of wages for work of a similar character (exclusive of maintenance work) in the locality in which the work is performed and not less than the prevailing hourly rate of wages for legal holiday and overtime work (exclusive of maintenance work) in the locality in which the work is performed both as determined by the Department of Labor and Industrial Relations or determined by the Court of Appeal, as provided for in said contract and in any and all duly authorized modifications of said contract that may be hereafter made, with or without notice to the Surety, then, this obligation shall be void and of no effect, but it is expressly understood that if the Principal should make default in or should fail to strictly, faithfully and efficiently do, perform and comply with any or more of the covenants, agreements, stipulations, conditions, requirements or undertakings, as specified in or by the terms of said contract, and with the time therein named, then this obligation shall be valid and binding upon each of the parties hereto and this bond shall remain in full force and effect; and the same may be sued on at the instance of any material man, laborer, mechanic, subcontractor, individual, or otherwise to whom such payment is due, in the name of the State of Missouri, to the use of any such person.

AND, IT IS FURTHER specifically provided that any modifications which may hereinafter be made in the terms of the contract or in the work to be done under it or the giving by the Owner of any extension of the time for the performance of the contract or any other forbearance on the part of either the Owner or the Principal to the other, shall not in any way release the Principal and the Surety, or either or any of them, their heirs, executors, administrators and successors, from their liability hereunder, notice to the Surety of any such extension, modifications or forbearance being hereby waived.

IN WITNESS WHEREOF, the above bounden parties have executed the within instrument this _____ day of _____, 20 ____.

AS APPLICABLE:

AN INDIVIDUAL

Name: _____

Signature: _____

A PARTNERSHIP

Name of Partner: _____

Signature of Partner: _____

Name of Partner: _____

Signature of Partner: _____

CORPORATION

Firm Name: _____

Signature of President: _____

SURETY

Surety Name: _____

Attorney-in-Fact: _____

Address of Attorney-in-Fact: _____

Telephone Number of Attorney-in-Fact: _____

Signature Attorney-in-Fact: _____

NOTE: Surety shall attach Power of Attorney



STATE OF MISSOURI
OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION
PRODUCT SUBSTITUTION REQUEST

PROJECT NUMBER

PROJECT TITLE AND LOCATION

CHECK APPROPRIATE BOX

- ☐ **SUBSTITUTION PRIOR TO BID OPENING**
(Minimum of (5) working days prior to receipt of Bids as per Article 4 – Instructions to Bidders)
- ☐ **SUBSTITUTION FOLLOWING AWARD**
(Maximum of (20) working days from Notice to Proceed as per Article 3 – General Conditions)

FROM: BIDDER/CONTRACTOR (PRINT COMPANY NAME)

TO: ARCHITECT/ENGINEER (PRINT COMPANY NAME)

Bidder/Contractor hereby requests acceptance of the following product or systems as a substitution in accordance with provisions of Division One of the Bidding Documents:

SPECIFIED PRODUCT OR SYSTEM

SPECIFICATION SECTION NO.

SUPPORTING DATA

- ☐ Product data for proposed substitution is attached (include description of product, standards, performance, and test data)
- ☐ Sample ☐ Sample will be sent, if requested

QUALITY COMPARISON

	SPECIFIED PRODUCT	SUBSTITUTION REQUEST
NAME, BRAND		
CATALOG NO.		
MANUFACTURER		
VENDOR		

PREVIOUS INSTALLATIONS

PROJECT	ARCHITECT/ENGINEER
LOCATION	DATE INSTALLED

SIGNIFICANT VARIATIONS FROM SPECIFIED PRODUCT

REASON FOR SUBSTITUTION

DOES PROPOSED SUBSTITUTION AFFECT OTHER PARTS OF WORK?☐ YES ☐ NO

IF YES, EXPLAIN

SUBSTITUTION REQUIRES DIMENSIONAL REVISION OR REDESIGN OF STRUCTURE OR A/E WORK☐ YES ☐ NO**BIDDER'S/CONTRACTOR'S STATEMENT OF CONFORMANCE OF PROPOSED SUBSTITUTION TO CONTRACT REQUIREMENT:**

We have investigated the proposed substitution. We believe that it is equal or superior in all respects to specified product, except as stated above; that it will provide the same Warranty as specified product; that we have included complete implications of the substitution; that we will pay redesign and other costs caused by the substitution which subsequently become apparent; and that we will pay costs to modify other parts of the Work as may be needed, to make all parts of the Work complete and functioning as a result of the substitution.

BIDDER/CONTRACTOR

DATE

REVIEW AND ACTION☐ Resubmit Substitution Request with the following additional information:

☐ Substitution is accepted.☐ Substitution is accepted with the following comments:

☐ Substitution is not accepted.

ARCHITECT/ENGINEER

DATE



STATE OF MISSOURI
OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION
FINAL RECEIPT OF PAYMENT AND RELEASE

PROJECT NUMBER

KNOW ALL MEN BY THESE PRESENT THAT: hereinafter called "Subcontractor" who heretofore entered into an agreement with hereinafter called "Contractor", for the performance of work and/or furnishing of material for the construction of the project entitled

(PROJECT TITLE, PROJECT LOCATION, AND PROJECT NUMBER)

at

(ADDRESS OF PROJECT)

for the State of Missouri (Owner) which said subcontract is by this reference incorporated herein, in consideration of such final payment by Contractor.

DOES HEREBY:

1. ACKNOWLEDGE that they have been **PAID IN FULL** all sums due for work and materials contracted or done by their Subcontractors, Material Vendors, Equipment and Fixture Suppliers, Agents and Employees, or otherwise in the performance of the Work called for by the aforesaid Contract and all modifications or extras or additions thereto, for the construction of said project or otherwise.
2. RELEASE and fully, finally, and forever discharge the Owner from any and all suits, actions, claims, and demands for payment for work performed or materials supplied by Subcontractor in accordance with the requirements of the above referenced Contract.
1. REPRESENT that all of their Employees, Subcontractors, Material Vendors, Equipment and Fixture Suppliers, and everyone else has been **paid in full** all sums due them, or any of them, in connection with performance of said Work, or anything done or omitted by them, or any of them in connection with the construction of said improvements, or otherwise.

DATED this day of , 20 .

NAME OF SUBCONTRACTOR

BY (TYPED OR PRINTED NAME)

SIGNATURE

TITLE

ORIGINAL: FILE/Closeout Documents



STATE OF MISSOURI
OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT,
DESIGN AND CONSTRUCTION

MBE/WBE/SDVE PROGRESS REPORT

Remit with ALL Progress and Final Payments

(Please check appropriate box) ☐CONSULTANT ☐CONSTRUCTION

PAY APP NO.	PROJECT NUMBER
CHECK IF FINAL ☒ FINAL	DATE

PROJECT TITLE			
PROJECT LOCATION			
FIRM			
ORIGINAL CONTRACT SUM (Same as Line Item 1. on Form A of Application for Payment) \$		TOTAL CONTRACT SUM TO DATE (Same as Line Item 3. on Form A of Application for Payment) \$	
THE TOTAL MBE/WBE/SDVE PARTICIPATION DOLLAR AMOUNT OF THIS PROJECT AS INDICATED IN THE ORIGINAL CONTRACT: \$			
SELECT MBE, WBE, SDVE	ORIGINAL CONTRACT PARTICIPATION AMOUNT	PARTICIPATION AMOUNT PAID-TO-DATE (includes approved contract changes)	CONSULTANT/SUBCONSULTANT OR CONTRACTOR/SUBCONTRACTOR/SUPPLIER COMPANY NAME
☐ MBE ☐ WBE ☐ SDVE	\$	\$	
☐ MBE ☐ WBE ☐ SDVE	\$	\$	
☐ MBE ☐ WBE ☐ SDVE	\$	\$	
☐ MBE ☐ WBE ☐ SDVE	\$	\$	
☐ MBE ☐ WBE ☐ SDVE	\$	\$	
☐ MBE ☐ WBE ☐ SDVE	\$	\$	

Revised 06/2023

INSTRUCTIONS FOR MBE/WBE/SDVE PROGRESS REPORT

CONTRACTOR OR CONSULTANT TO FILL OUT AND REMIT WITH EACH PAY APPLICATION:

The MBE/WBE/SDVE Progress Report for the project is issued with the contract comprising values reported in the consultant's Proposal or on the successful contractor's Section 004337 Compliance Evaluation Forms.

At Initial Pay Application fill in the following:

1. Pay App No. Start with 1.
2. Fill in the Project Number and Date.
3. Enter Project Title, Project Location, and Firm.
4. Fill in the "Original Contract Sum" and "Total Contract Sum To Date" (Reference applicable Line Items on Form A of Application for Payment).
5. Indicate the Total Participation Dollar Amount from the Original Contract.
6. Select MBE, WBE, or SDVE for each Consultant/Subconsultant or Contractor/Subcontractor/Supplier.
7. Enter the "Total Amount of Subcontract", "\$ Amount (Paid-To-Date)", and Company Name.

For all subsequent Pay Applications fill in the following:

1. Pay App No.
2. If Final Pay App, check box.
3. Fill in the Project Number and Date.
4. Enter Project Title, Project Location, and Firm
5. At each Pay App fill in the "Original Contract Sum" and "Total Contract Sum To Date" (reference applicable Line Items on Form A of Application for Payment).
6. Indicate the Total Participation Dollar Amount from the Original Contract.
7. Select MBE, WBE, or SDVE for each Consultant/Subconsultant or Contractor/Subcontractor/Supplier
8. Enter the "Total Amount of Subcontract", "\$ Amount (Paid-To-Date)", and Company Name.



STATE OF MISSOURI
OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION
AFFIDAVIT – COMPLIANCE WITH PREVAILING WAGE LAW

PROJECT NUMBER

Before me, the undersigned Notary Public, in and for the County of _____

State of _____ personally came and appeared _____

(NAME)

of the _____

(POSITION)

(NAME OF THE COMPANY)

(a corporation) (a partnership) (a proprietorship) and after being duly sworn did depose and say that all provisions and requirements set out in Chapter 290, Sections 290.210 through and including 290.340, Missouri Revised Statutes, pertaining to the payment of wages to workmen employed on public works project have been fully satisfied and there has been no exception to the full and completed compliance with said provisions and requirements

and with Wage Determination No: _____ issued by the

Department of Labor and Industrial Relations, State of Missouri on the _____ day of _____ 20 ____

in carrying out the contract and working in connection with _____

(NAME OF PROJECT)

Located at _____ in _____ County

(NAME OF THE INSTITUTION)

Missouri, and completed on the _____ day of _____ 20 ____

SIGNATURE

NOTARY INFORMATION

NOTARY PUBLIC EMBOSSE OR
BLACK INK RUBBER STAMP SEAL

STATE

COUNTY (OR CITY OF ST. LOUIS)

SUBSCRIBED AND SWORN BEFORE ME, THIS

DAY OF

YEAR

USE RUBBER STAMP IN CLEAR AREA BELOW

NOTARY PUBLIC SIGNATURE

MY COMMISSION
EXPIRES

NOTARY PUBLIC NAME (TYPED OR PRINTED)

FILE: Closeout Documents

CERTIFICATE OF MATERIALS ORIGIN

FEDERAL PROJECT NUMBER		STATE PROJCT NUMBER	
ITEM DESCRIPTION		BID ITEM NUMBER	
INVOICE NUMBER		QUANTITY	
DATE RECEIVED		BILL OF LADING No.	

MATERIAL SOURCE (NAME AND ADDRESS) TO INCLUDE EACH SUPPLIER, FABRICATOR, AND MANUFACTURER INCLUDING HEAT/BATCH NUMBERS IF AVAILABLE

MATERIAL DESCRIPTION

DESCRIPTION OF MATERIALS OF UNKNOWN ORIGIN OR FOREIGN MATERIALS DELIVERED TO THE PROJECT

This certification is made for the purpose of establishing the materials acceptance under the Buy America Certification (23CFR 635.410) and the Contract Special Provisions. All iron and steel manufacturing processes, including protective coating for the domestic materials described above occurred in the United States of America. Manufacturer's certificates verify the origin above described in the domestic materials and will be kept on file for three years by the suppliers following final payment. Copies will be provided to the Missouri Department of Natural Resources upon request.

I declare under penalty of perjury under the Missouri and Federal Laws that the foregoing is true and correct.

Company Name and Address	Authorized Representative
	Name: Title: Signature: Date:

CERTIFICATE OF MATERIALS ORIGIN (NON-IRON/STEEL)

FEDERAL PROJECT NUMBER		STATE PROJECT NUMBER	
ITEM DESCRIPTION		BID ITEM NUMBER	
INVOICE NUMBER		QUANTITY	
DATE RECEIVED		BILL OF LADING No.	

MATERIAL SOURCE (NAME AND ADDRESS) TO INCLUDE EACH SUPPLIER, FABRICATOR, AND MANUFACTURER INCLUDING HEAT/BATCH NUMBERS IF AVAILABLE

MATERIAL DESCRIPTION

DESCRIPTION OF MATERIALS OF UNKNOWN ORIGIN OR FOREIGN MATERIALS DELIVERED TO THE PROJECT

This certification is made for the purpose of establishing the materials acceptance under the Buy America requirements in the Jobs ACT legislation which includes Build America, Buy America Act Publication L. No. 117-68. This certification is for the additional construction material requirements to be domestically produced in addition to the existing steel and iron Buy America requirements. The construction material origin and any manufacturing processes for this product shall all be performed domestically in the United States of America. Manufacturer's certificates shall verify the origin above described in the domestic materials and will be kept on file for three years by the suppliers following final payment. Copies will be provided to the Missouri Department of Natural Resources upon request.

I declare to the best of my knowledge under penalty of perjury under the Missouri and Federal Laws that the foregoing is true and correct.

Company Name and Address	Authorized Representative
	Name: Title: Signature: Date:

BUILD AMERICA BUY AMERICA WAIVER REQUEST DATA COLLECTION

This data collection is for submitting a waiver request to the Build America, Buy America requirements. According to the Build America Buy America Act (BABAA), “none of the funds made available for a Federal financial assistance program for infrastructure, including each deficient program¹, may be obligated for a project unless all of the iron, steel, manufactured products, and construction materials used in the project are produced in the United States.”

Waivers are explained in the [Office of Management and Budget Memorandum 22-11](#) and required by the [Infrastructure, Investments and Jobs Act](#) (IIJA) sections 70901 through 70952. Each waiver request must provide responses to the form questions, as applicable. Instructions are provided in the next paragraph. [Recipient instructions](#) can be found on pages 9 through 12 of this document. Contact your Federal Agency contact for your award or for additional assistance with completing this data collection.

Instructions: The applicant/recipient/subrecipient need to complete questions 1 through 16, sign and certify the form, and email/submit the waiver request to the Federal agency contact identified in your Federal award notification. The Federal agency will complete questions 1A through 11A. The Federal agency will review and determine to approve or not approve the waiver request.

If additional space is needed, see [attachment instructions](#) on page 8.

Required fields are marked with an asterisk (*)

Questions to be Answered by the Applicant, Recipient, or Subrecipient

1. Submitter Type: *

Applicant

Recipient

Subrecipient

2. Submitter Contact Information

Legal Name *

Unique Entity Identifier (UEI) *

Address 1 *

Address 2

City *

County/Parish

State

Province

Country *

Zip/Postal Code *

3. Submitter First and Last Name*

4. Submitter Email *

5. Submitter Phone Number *

¹ See IIJA, § 70913(c) for description of the term “deficient program.”

6. Describe the infrastructure project description and location, to the extent known. *

7. Total funding, including federal and non-federal shares: *

8. Total estimated infrastructure costs, including all federal and non-federal shares (to the extent known): *

9. Is this waiver for a specific product or a category of products? Check one below: *

- a. Specific Product
 - b. Category of Products
-

10. Listing of Materials, Technical Specifications, and Quantity: *

List of iron or steel items, manufactured products, and construction materials proposed to be excepted from BABAA requirements, including name, cost, countries of origin (if known), and relevant Product Service Code (PSC) and North American Industry Classification System (NAICS) code for each. List each item separately. List the name of the product, how much the product costs, in U.S. dollars, the country or countries of origin, if known, and the relevant PSC and NAICS for each product. Links to manuals that provide the PSC and NAICS codes:

- PSC Codes: <https://www.acquisition.gov/psc-manual>
 - NAICS Codes: <https://www.census.gov/naics/>
-

10.1 Technical specification descriptions of items to be waived, if applicable.

10.2 Quantity required:

11. Waiver Type *

Choose one of the three waiver types listed in this section and only answer the questions applicable to the chosen waiver type.

- **Nonavailability waivers:** Complete questions [11.1.1](#), and [11.1.2](#).
- **Unreasonable Cost waivers:** Complete questions [11.2.1](#), [11.2.2](#), and [11.2.3](#).
- **Public Interest waivers:** Complete question [11.3](#).

11.1 Nonavailability Waiver

Applicable responses to the following are required:

11.1.1 A description of the due diligence performed by the applicant, including names and contact information of the manufacturers, distributors, or suppliers contacted for quotes (minimum 3), and the responses provided.

11.1.2 If one or more respondent indicated that they could provide a Build America Buy America (BABA) compliant item, but you are requesting the non-availability waiver because the lead time to obtain the BABA compliant item is excessive, indicate below how the difference in lead time between a BABA compliant and non-compliant item is going to cause the project to miss a significant milestone or deadline.

11.2 Unreasonable Cost Waiver (BABA compliance increases total project cost by more than 25 percent)

Applicable responses to the following are required:

11.2.1 What is the additional cost of the BABA compliant items, compared to using iron and steel, manufactured products, and construction materials of non-domestic or unknown origin? Attach documentation of prices for BABA compliant and non-compliant items for items to be included in the cost comparison. Attach an additional PDF file if needed.

(See page 8 for [attachment instructions](#))

11.2.2 What is the additional administrative cost for compliance with the BABA requirements? Attach a certification from the engineer or architect attesting to the actual or expected additional administrative cost. Attach an additional PDF file if needed. (See page 8 for [attachment instructions](#))

11.2.3 The BABA requirements will be waived for individual items until the total additional cost of BABA compliance is less than 25 percent of the total project cost. Which items is the applicant requesting to be waived from the BABA requirements to reduce costs below the 25 percent cost threshold?

11.3 Public Interest Waiver

Explain how waiving the BABA requirement for this project or product serves the public interest.

12. Additional Waiver Information

Provide any additional information for the Agency's consideration of the requested waiver.

13. Anticipated Impacts *

Identify any anticipated impacts if no waiver is issued. Attach additional PDF pages if needed.

(See page 8 for [attachment instructions](#))

14. Certifying Official Name: *

15. Certifying Official Signature: *

16. Date of Certification: *

Questions to be Answered by the Federal Agency

All fields are required and must be filled out.

If additional space is needed see [attachment instructions on page 8](#).

Federal [agency instructions](#) can be found on pages 13 and 14 of this document.

1A. Federal Awarding Agency

2A. Federal Financial Assistance Program Listing Number

3A. Federal Financial Assistance Program Title

4A. Federal Awarding Agency Point of Contact

First Name

Last Name

Email

Phone

5A. FAIN and Federal Awarding Agency Organizational Information

Provide the Federal Award Identification Number (FAIN) (if available) and Federal Agency name, subcomponent name (if known), and the CGAC code (e.g., Common Government-wide Accounting Classification (CGAC) Agency Code).

Enter the Federal Agency name, and subcomponent name, if known, and the CGAC code. **USDA's CGAC code is 012. For example, an appropriate response would be U.S. Department of Agriculture, Forest Service, CGAC 012.**

FAIN

Federal Agency name, and subcomponent name, if known, and the CGAC code

6A. Waiver Level

Select one of the four waiver levels:

Project

Award

Program

Agency

7A. Is this a general applicability waiver?

Yes

No

8A. Agency Summary and Determination

Provide an agency summary and determination regarding the waiver request.

9A. Agency Waiver

This response should be a narrative and include all necessary information to support the justification for a waiver. To avoid the need for a project-specific waiver, a justification may cite, if applicable, the absence of any BABA compliant bids received in response to a solicitation.

(See page 8 for [attachment instructions](#)).

10A. Public Comments

Provide any relevant comments received through the public comment period. This section is to be filled out after the waiver has been posted to the Agency's BABA Website. For example, the USDA website is found at <https://www.usda.gov/ocfo/federal-financial-assistance-policy/USDABuyAmericaWaiver>.

11A. Waiver Timeline

Select the timeline you are requesting for the waiver of the BABAA domestic sourcing requirements.

For the entire period of performance of the grant in which the infrastructure projects will occur.

OR

For a limited time during the period of performance of the grant. We request a waiver of the identified BABAA domestic sourcing requirements from [] to [] date.

File Attachment Instructions

Attach PDF files if additional space is needed to answer any of the questions in this form. Indicate which questions the attachment addresses.

To attach a file, select the “Attach File” button to open the Attachment Panel in Adobe Reader or Acrobat.



Drag and drop your attachments to the panel or select the “Add a New Attachment” button from the left Attachment panel in Adobe reader or Acrobat.

Please indicate which questions the attachments address by naming your file with the question number (i.e., Question 9A.pdf).

Recipient Instructions:

1. **Submitter Type:** Select a submitter type. Applicant, Recipient or Subrecipient.
2. **Submitter Contact Information:**
 - **Legal Name:** Required. Enter the legal name of the financial assistance award recipient that is seeking a waiver under the award. This is the organization that has registered with the System for Award Management (SAM). Information on registering with SAM may be obtained by visiting [SAM.gov](https://sam.gov).
 - **UEI:** Required. Enter the organization's Unique Entity Identifier (UEI) received from SAM. The UEI is a unique 12 character organization identifier. Information on registering with System for Award Management ([SAM.gov](https://sam.gov)) may be obtained by visiting the [Grants.gov](https://grants.gov) website. If the entity is not required to register in SAM.gov, respond "Exempt from registration in SAM.gov."
 - **Address:** Required. Enter address: **Address 1** (required); **City** (required); **County/Parish, State** (required if country is US); **Province; Country** (required); **9-digit ZIP/Postal Code** (required if country is US). If +4 does not exist or it is unknown for the address, enter "0000".
3. **Submitter First and Last Name:** Provide the first and last name of the person submitting the waiver request.
4. **Submitter Email:** Enter the email of the person submitting the waiver request.
5. **Submitter Phone Number:** Enter the area code and phone number of the person submitting the waiver request. Include the area code, phone number and phone extension if applicable.
6. **Describe the infrastructure project description and location** (to the extent known). The location can be an address (street, city, state, country and postal code) or a description of an area, such as a roadway or tract of land. Global Positioning System (GPS) location information may also be used.
7. **Total Funding, including Federal and non-Federal shares:** Report the total funding amount for the award, in whole dollars. If the entity is contributing non-Federal funds, sometimes known as cost sharing or match, and add that to the Federal funding amount and report the sum of the two figures in the field.
8. **Total estimated infrastructure costs, including all Federal and non-Federal shares** (to the extent known): List the portion of the total award amount that represents construction costs, including any Federal funding being used for this project. If the entity is contributing non-Federal funds, sometimes known as cost sharing or match, add that to the Federal funding amount and report the sum of the two figures in the field.
9. **Is this a waiver for a specific product or a category of products?** Check the box next to Specific Product or Category of products.

Example:

9a. **Product waiver:** 8-inch stainless steel valves

9b. **Category of products:** all valves on the project.

10. Listing of Materials, Technical Specifications, and Quantity

List of iron or steel item(s), manufactured products, and construction material(s) proposed to be excepted from BABAA requirements, including name, cost, country(ies) of origin (if known), and relevant Product Service Code (PSC) and North American Industry Classification System (NAICS) code for each. Please see the instructions below for listing the items. List the name of the product, how much the product costs, in U.S. Dollars, the country or countries of origin, if known, and the relevant PSC and NAICS for each product. Links to manuals that provide the PSC and NAICS codes can be found below.

10.1 Technical specifications description of items to be waived, if applicable. Provide the technical specifications for each of the items listed in question 10.

10.2 Quantity required: List the quantity required for each item listed in question 10.

- **PSC Codes:** <https://www.acquisition.gov/psc-manual>
- **NAICS Codes:** <https://www.census.gov/naics/>

List each item separately.

- **“Manufactured Product”:** Items that consist of two or more of the listed construction materials below that have been combined together through a manufacturing process, and items that include at least one of the listed construction materials combined with a material that is not listed through a manufacturing process, should be treated as manufactured products, rather than as construction materials. For example, a plastic framed sliding window should be treated as a manufactured product while plate glass should be treated as a construction material.
- **“Construction Materials”** includes an article, material, or supply— other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives— that is or consists primarily of:
 - non-ferrous metals;
 - plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables);
 - glass (including optic glass);
 - lumber; or drywall.

11. Waiver type: Choose one of the three waiver types listed in this section and only answer the questions applicable to the chosen waiver type:

- **Nonavailability waivers:** Complete questions 11.1, 11.1.1, and 11.1.2.
- **Unreasonable Cost waivers:** Complete questions 11.2, 11.2.1, 11.2.2, and 11.2.3.
- **Public Interest waivers:** Complete question 11.3.

Provide sufficient information related to the specific request.

11.1 Nonavailability Waiver: Check this box if seeking a Nonavailability waiver. By choosing this selection, this means you are unable to obtain American made iron, steel, manufactured products, or construction materials for an infrastructure project. You are requesting the Federal agency to waive the application of the Build America Buy America domestic preference. You must demonstrate market research, which may be accomplished with assistance from the Federal agency, and adequately considered qualified alternate items, products, or materials.

Applicable responses to the following are required:

- 11.1.1** A description of the due diligence performed by the applicant, engineer/architect, or contractor, including names and contact information of the manufacturers, distributors, or suppliers contacted for quotes (minimum 3), and the responses provided.
- 11.1.2** If one or more respondent indicated that they could provide a BABA compliant item, but you are requesting the non-availability waiver because the lead time to obtain the BABA compliant item is excessive, indicate below how the difference in lead time between a BABA compliant and non-compliant item is going to cause the project to miss a significant milestone or deadline.

- 11.2 Unreasonable Cost.** (BABA compliance increases total project cost by more than 25 percent). This checkbox is chosen when the inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the total project cost to the overall project by more than 25 percent. You are requesting the Federal agency to waive the application of the BABAA domestic preference. You must provide documentation to the Federal agency that no domestic alternatives are available within the cost parameter. This may be accomplished with assistance from the Federal agency.

Applicable responses to the following are required:

- 11.2.1** What is the additional cost of BABA compliant iron and steel, manufactured products, and construction materials, compared to items of non-domestic or unknown origin? Attach documentation of prices for BABA compliant and non-compliant items for items to be included in the cost comparison. Such documentation may include quotes from suppliers or bid tabulations from bid actions which solicited both BABA compliant and non-compliant products. Attach an additional PDC file if needed.
- 11.2.2** What is the additional administrative cost for compliance with the BABA requirements? Attach a certification from the engineer or architect attesting to the actual or expected additional administrative cost. Attach an additional PDF file if needed.
- 11.2.3** The BABAA allows for a waiver in cases where “the inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25 percent.” If you are requesting a waiver under this requirement, we will waive items until the excess costs due to BABA are less than 125 percent of the non-BABA project. The BABA requirements will be waived for individual items until the total additional cost of BABA compliance is less than 25 percent of the total project cost.

For example, the project has three items which each cost \$20 for the non-domestic item. The equivalent domestic item costs \$30. Total project cost includes those items, along with \$40 of labor and soft costs. (“Soft costs” is a construction industry term or contractor accounting term for an expense item that is not considered direct construction cost. Soft costs include architectural, engineering, financing, and legal fees, and other pre- and post-construction expenses.) In this example, administration of BABA adds \$4 to soft costs. The total cost of the non-BABA project would be \$100 ($3 \times \$20 + \40) and the BABA project is \$134 ($3 \times \$30 + \44), a 34 percent increase. Waiving BABA requirements for one of the three items would decrease total project cost to \$124, which is less than 25 percent cost threshold.

Item	BABA cost	Non-BABA cost
Construction contracts		
Items procured outside of construction contract		
Architecture/engineering services		
Subconsultants		
Land and right-of-ways		
Legal services		
Funds administration		
Construction management		
Construction contingency		
Interest		
Equipment		
Refinancing		
Other soft costs		
Total Project Cost	A	B

1) Percentage increase in total project cost due to BABA (= 100 percent multiplied by (A-B)/B):

2) Dollar amount to be waived (= A – 1.25 multiplied by B):

Indicate which items the applicant wishes to waive from the BABA requirements to bring the total costs below 125 percent of the non-BABA total project cost. Items should be selected judiciously so that the total cost savings of using non-BABA items exceeds the amount in Row 2 by the smallest practicable amount. Only items submitted in response to question 10.2.1 are eligible for a waiver (it is not expected that soft costs will be affected significantly by the waiver).

11.3 Public Interest. Explain how waiving the BABA requirement for this project or product serves the public interest. By choosing this checkbox, you will explain how waiving the BABA domestic preference for this project or product serves the public interest. You can demonstrate definite impacts on the community if specific items, products or materials are not utilized in an infrastructure project. You are requesting the Federal agency waive the application of the BABA domestic preference because the domestic content preference would be inconsistent with the public interest. You will ensure this waiver is used judiciously and construed to ensure the maximum utilization of goods, products, and materials produced in the United States.

12. Waiver Additional Information: Indicate any additional information for the Agency's consideration of the requested waiver.

13. Anticipated Impacts: Identify any anticipated impacts if no waiver is issued. Provide a narrative that will explain the impact to the award, project, or the public should the waiver be denied. Attach additional PDF pages if needed.

14. Certifying Official Name: The name of the person who is certifying the waiver request.

15. Certifying Official Signature: The signature of the person who is certifying the waiver request will sign this section.

16. Date of Certification: Provide the date (MM/DD/YYYY) that the signature was provided.

Federal Agency Instructions:

- 1A. Provide the Federal awarding agency.
- 2A. Provide the Federal financial assistance program listing number.
- 3A. Provide the Federal financial assistance program title.
- 4A. Provide the first name, last name, email, and phone number of the Federal awarding agency point of contact.
- 5A. Provide the Federal Award Identification Number (FAIN) (if available) and the Federal awarding agency organizational information (e.g., Common Government wide Accounting Classification (CGAC) Agency Code). Enter the Federal Agency name, and subcomponent name if known, and the CGAC code. **USDA's CGAC code is 012. For example, an appropriate response would be U.S. Department of Agriculture, Forest Service, CGAC 012.**
- 6A. Indicate waiver level. Project, Award, Program or Agency.
- 7A. Is this a general applicability waiver? Indicate if this is a general applicability waiver or not.
- 8A. Agency summary and determination regarding the waiver request. Provide a narrative summarizing the Federal Agency's determination of the waiver request. It should include the reasons for approving or disapproving the waiver.
- 9A. Agency waiver: In an attempt to avoid the need for a project specific waiver, such a justification may cite, if applicable, the absence of any Buy America-compliant bids received in response to a solicitation. This should be a narrative and include all necessary information to support the justification for a waiver. This may be submitted as an attachment as a PDF file.
- 10A. Any relevant comments received through the public comment period. This is to be filled out after the waiver has been posted to the Agency's Buy American Website. For example, the USDA website is found here: <https://www.usda.gov/ocfo/federal-financial-assistance-policy/USDABuyAmericaWaiver>.
- 11A. Select the timeline you are requesting for the waiver of the BABAA domestic sourcing requirements:

For the entire period of performance of the grant in which the infrastructure projects will occur.
OR
For a limited time during the period of performance of the grant. We request a waiver of the identified BABAA domestic sourcing requirements from [XX/XX/XXXX] only until [XX/XX/XXXX] date. After the identified end date, if there is a need for another waiver for the infrastructure projects, a new Build America Buy America Waiver Request form must be completed and submitted to the Federal agency. The waiver time frame cannot exceed the approved period of performance of the grant unless there is an approved grant extension by the Federal awarding agency.

Public Posting of Waiver Request Information

The BABAA domestic sourcing requirements waiver authority generally requires the Federal awarding agency to post this waiver information for a period of public comment and review. The Department will not publicly post information considered to be personally identifiable information (PII), including signatures and specific contact information such as an email address and phone number. However, all other information contained in this form, along with any supporting documentation, may be publicly posted so that the public has adequate information to comment on your requested waiver of the BABAA domestic sourcing requirements. If you feel that some of the information contained in this waiver request is “proprietary information” and do not want this information disclosed, please follow the instructions in “Submission of Proprietary Information”, below. Please note that your designations of exempt material are not binding on the Department.

Submission of Proprietary Information

FOIA exempts from mandatory disclosure any “trade secrets or commercial or financial information obtained from a person and privileged or confidential.” 5 U.S.C. 552(b)(4) (Exemption 4). In accordance with Exemption 4, the Department will maintain as confidential any documents submitted by you, or prepared by the applicant or grantee, that are both customarily and actually treated as private by the applicant or grantee, or closely held and not publicly disseminated. If you feel that some or all of this submission falls within the scope of Exemption 4 and is entitled to confidential treatment, you must indicate the specific information the applicant or grantee considers proprietary in a cover attachment to this form. Please note that your designations of exempt material are not binding on the Department.

Paperwork Burden Statement

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless such collection displays a valid OMB control number. The valid OMB control number for this information collection is 0505-0028. Public reporting burden for this collection of information is estimated to average 10 hours per response, including time for reviewing instructions, searching existing data sources, gathering, and maintaining the data needed, and completing and reviewing the collection of information. The obligation to respond to this collection is *required to obtain or retain benefit* (with section 70914 of the [Build America Buy America Act \(Pub. L. No. 117-58 §§ 70901-70952\)](#)). If you have any comments concerning the accuracy of the time estimate, suggestions for improving this individual collection, or if you have comments or concerns regarding the status of your individual form, application, or survey, please contact your assigned program officer directly.

GENERAL CONDITIONS

INDEX

ARTICLE:

1. General Provisions

- 1.1. Definitions
- 1.2. Drawings and Specifications
- 1.3. Compliance with Laws, Permits, Regulations and Inspections
- 1.4. Nondiscrimination in Employment
- 1.5. Anti-Kickback
- 1.6. Patents and Royalties
- 1.7. Preference for American and Missouri Products and Services
- 1.8. Communications
- 1.9. Separate Contracts and Cooperation
- 1.10. Assignment of Contract
- 1.11. Indemnification
- 1.12. Disputes and Disagreements

2. Owner/Designer Responsibilities

3. Contractor Responsibilities

- 3.1. Acceptable Substitutions
- 3.2. Submittals
- 3.3. As-Built Drawings
- 3.4. Guaranty and Warranties
- 3.5. Operation and Maintenance Manuals
- 3.6. Other Contractor Responsibilities
- 3.7. Subcontracts

4. Changes in the Work

- 4.1. Changes in the Work
- 4.2. Changes in Completion Time

5. Construction and Completion

- 5.1. Construction Commencement
- 5.2. Project Construction
- 5.3. Project Completion
- 5.4. Payments

6. Bond and Insurance

6.1. Bond

6.2. Insurance

7. Termination or Suspension of Contract

7.1. For Site Conditions

7.2. For Cause

7.3. For Convenience

SECTION 007213 - GENERAL CONDITIONS

- A. These General Conditions apply to each section of these specifications. The Contractor is subject to the provisions contained herein.
- B. The General Conditions are intended to define the relationship of the Owner, the Designer and the Contractor thereby establishing certain rules and provisions governing the operation and performance of the work so that the work may be performed in a safe, orderly, expeditious and workmanlike manner.

ARTICLE 1 – GENERAL PROVISIONS

ARTICLE 1.1 - DEFINITIONS

As used in these contract documents, the following terms shall have the meanings and refer to the parties designated in these definitions.

1. **"COMMISSIONER"**: The Commissioner of the Office of Administration.
2. **"CONSTRUCTION DOCUMENTS"**: The "Construction Documents" shall consist of the Project Manual, Drawings and Addenda.
3. **"CONSTRUCTION REPRESENTATIVE"**: Whenever the term "Construction Representative" is used, it shall mean the Owner's Representative at the work site.
4. **"CONTRACTOR"**: Party or parties who have entered into a contract with the Owner to furnish work under these specifications and drawings.
5. **"DESIGNER"**: When the term "Designer" is used herein, it shall refer to the Architect, Engineer, or Consultant of Record specified and defined in Paragraph 2.0 of the Supplemental Conditions, or his duly authorized representative. The Designer may be either a consultant or state employee.
6. **"DIRECTOR"**: Whenever the term "Director" is used, it shall mean the Director of the Division of Facilities Management, Design and Construction or his Designee, representing the Office of Administration, State of Missouri. The Director is the agent of the Owner.
7. **"DIVISION"**: Shall mean the Division of Facilities Management, Design and Construction, State of Missouri.
8. **"INCIDENTAL JOB BURDENS"**: Shall mean those expenses relating to the cost of work, incurred either in the home office or on the job-site, which are necessary in the course of doing business but are incidental to the job. Such costs include office supplies and equipment, postage, courier services, telephone expenses including long distance, water and ice and other similar expenses.
9. **"JOINT VENTURE"**: An association of two (2) or more businesses to carry out a single business enterprise for profit for which purpose they combine their property, capital, efforts, skills and knowledge.
10. **"OWNER"**: Whenever the term "Owner" is used, it shall mean the State of Missouri. Acting by and through the Office of Administration, Division of Facilities Management, Design and Construction.
11. **"PROJECT"**: Wherever the term "Project" is used, it shall mean the work required to be completed by the construction contract.
12. **"PROJECT MANUAL"**: The "Project Manual" shall consist of Introductory Information, Invitation for Bid, Instructions to Bidders, Bid Documents, Additional Information, Standard Forms, General Conditions, Supplemental General Conditions, General Requirements and Technical Specifications.
13. **"SUBCONTRACTOR"**: Party or parties who contract under, or for the performance of part or this entire Contract between the Owner and Contractor. The subcontract may or may not be direct with the Contractor.
14. **"WORK"**: All supervision, labor, materials, tools, supplies, equipment, and any incidental operations and/or activities required by or reasonably inferable from the Contract Documents necessary to construct the Project and to produce the results intended by the Contract Documents in a safe, expeditious, orderly, and workmanlike manner so that the project shall be complete and finished in the best manner known to each respective trade.
15. **"WORKING DAYS"**: are all calendar days except Saturdays, Sundays and the following holidays: New Year's Day, Martin Luther King, Jr. Day, Lincoln Day, Washington's Birthday (observed), Truman Day, Memorial Day, Juneteenth, Independence Day, Labor Day, Columbus Day, Veterans Day (observed), Thanksgiving Day, Christmas Day.

ARTICLE 1.2 DRAWINGS AND SPECIFICATIONS

- A. In case of discrepancy between drawings and specifications, specifications shall govern. Should discrepancies in architectural drawings, structural drawings and mechanical drawings occur, architectural drawings shall govern and, in case of conflict between structural and mechanical drawings, structural drawings shall govern.
- B. Specifications are separated into titled divisions for convenience of reference only and to facilitate letting of contracts and subcontracts. The Contractor is responsible for establishing the scope of work for subcontractors, which may cross titled divisions. Neither the Owner nor Designer will establish limits and jurisdiction of subcontracts.
- C. Figured dimensions take precedence over scaled measurements and details over smaller scale general drawings. In the event of conflict between any of the documents contained within the contract, the documents shall take precedence and be controlling in the following sequence: addenda, supplementary general conditions, general conditions, division 1 specifications, technical division specifications, drawings, bid form and instructions to bidders.
- D. Anything shown on drawings and not mentioned in these specifications or vice versa, as well as any incidental work which is obviously necessary to complete the project within the limits established by the drawings and specifications, although not shown on or described therein, shall be performed by the Contractor at no additional cost as a part of his contract.
- E. Upon encountering conditions differing materially from those indicated in the contract documents, the Contractor shall promptly notify the Designer and Construction Representative in writing before such conditions are disturbed. The Designer shall promptly investigate said conditions and report to the Owner, with a recommended course of action. If conditions do materially differ and cause an increase or decrease in contract cost or time required for completion of any portion of the work, a contract change will be initiated as outlined in Article 4 of these General Conditions.
- E. Only work included in the contract documents is authorized, and the Contractor shall do no work other than that described therein or in accordance with appropriately authorized and approved contract changes.

ARTICLE 1.3 - COMPLIANCE WITH LAWS, PERMITS, REGULATIONS AND INSPECTIONS

- A. Since the Owner is the State of Missouri, municipal or political subdivisions, zoning ordinances, construction codes (other than licensing of trades), and other like ordinances are not applicable to construction on Owner's property, and Contractor will not be required to submit drawings and specifications to any municipal or political subdivision, authority, obtain construction permits or any other licenses (other than licensing of trades) or permits from or submit to inspections by any municipality or political subdivision relating to the construction for this project. All permits or licenses required by municipality or political subdivision for operation on property not belonging to Owner shall be obtained by and paid for by Contractor. Each Contractor shall comply with all applicable laws, ordinances, rules and regulations that pertain to the work of this contract.
- B. Contractors, subcontractors and their employees engaged in the businesses of electrical, mechanical, plumbing, carpentry, sprinkler system work, and other construction related trades shall be licensed to perform such work by the municipal or political subdivision where the project is located, if such licensure is required by local code. Local codes shall dictate the level (master, journeyman, and apprentice) and the number, type and ratio of licensed tradesmen required for this project within the jurisdiction of such municipal or political subdivision.
- C. Equipment and controls manufacturers and their authorized service and installation technicians that do not maintain an office within the jurisdiction of the municipal or political subdivision but are a listed or specified contractor or subcontractor on this project are exempt from Paragraph 1.3 B above.
- D. The Contractor shall post a copy of the wage determination issued for the project and included as a part of the contract documents, in a prominent and easily accessible location at the site of construction for the duration of the project.
- E. Any contractor or subcontractor to such contractor at any tier signing a contract to work on this project shall provide a ten-hour Occupational Safety and Health Administration (OSHA) construction safety program for their on-site employees which includes a course in construction safety and health approved by OSHA or a similar program approved by the Department of Labor and Industrial Relations which is at least as stringent as an approved OSHA program. The contractor shall forfeit as a penalty to the public body on whose

behalf the contract is made or awarded, two thousand five hundred dollars plus one hundred dollars for each employee employed by the contractor or subcontractor, for each calendar day, or portion thereof, such employee is employed without the required training.

ARTICLE 1.4 - NONDISCRIMINATION IN EMPLOYMENT

A. The Contractor and his subcontractors will not discriminate against individuals based on race, color, religion, national origin, sex, disability, or age, but may use restrictions which relate to bona fide occupational qualifications. Specifically, the Contractor and his subcontractors shall not discriminate:

1. Against recipients of service on the basis of race, color, religion, national origin, sex, disability or age.
2. Against any employee or applicant, for employment on the basis of race, color, religion, national origin, sex or otherwise qualified disability status.
3. Against any applicant for employment or employee on the basis of age, where such applicant or employee is between ages 40 and 70 and where such Contractor employs at least 20 persons.
4. Against any applicant for employment or employee on the basis of that person's status as a disabled or Vietnam-era veteran.

The Contractor and his Subcontractors will ensure applicants for employment and employees are treated equally without regard to race, color, religion, national origin, sex, disability, or age. Such action shall include, but not be limited to, the following: employment, upgrading, demotion and transfer; recruitment or recruitment advertising; and selection for training, including apprenticeship. The Contractor and his Subcontractors will give written notice of their commitments under this clause to any labor union with which they have bargaining or other agreements under this clause to any labor union with which they have bargaining or other agreements.

B. In the event of the Contractor's or his subcontractor's noncompliance with any provisions of this Article of the Contract, the Owner may cancel this contract in whole or in part or require the Contractor to terminate his contract with the subcontractor.

ARTICLE 1.5 - ANTI-KICKBACK

No employee of the division, shall have or acquire any pecuniary interest, whether direct or indirect, in this contract or in any part hereof. No officer, employee, designer, attorney, or administrator of or for the Owner who is authorized in such capacity and on behalf of the Owner to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the project, shall have or acquire any pecuniary interest, whether direct or indirect, in this contract, any material supply contract, subcontract, insurance contract, or any other contract pertaining to the project.

ARTICLE 1.6 - PATENTS AND ROYALTIES

A. The Contractor shall hold and save the Owner and its officers, agents, servants, and employees harmless from liabilities of any nature or kind, including cost and expenses, for, or on account of, any patented or unpatented invention, process, article or appliance manufactured or used in the performance of this contract, including its use by the Owner, unless otherwise specifically stipulated in the contract documents.

B. If the Contractor uses any design, device or materials covered by letters, patent or copyright, the Contractor shall provide for such use by suitable agreement with the Owner of such patented or copyrighted design, device or material. It is mutually agreed and understood, without exception, that the contract prices shall include all royalties or costs arising from the use of such design, device or materials, in any way involved in the work. The Contractor and/or his sureties shall indemnify and save harmless the Owner of the project from any and all claims for infringement by reason of the use of such patented or copyrighted design, device or materials or any trademark or copyright in connection with work agreed to be performed under this contract and shall indemnify the Owner for any cost, expense or damage it may be obliged to pay by reason of such infringement at any time during the prosecution of the work or after completion of the work.

ARTICLE 1.7 - PREFERENCE FOR AMERICAN AND MISSOURI PRODUCTS AND SERVICES

- A. By virtue of statutory authority a preference will be given to Missouri labor and to products of mines, forests and quarries of the state of Missouri when they are found in marketable quantities in the state, and all such materials shall be of the best quality and suitable character that can be obtained at reasonable market prices, all as provided for in Section 8.280, Missouri Revised Statutes and Cumulative Supplements.
- B. Furthermore, pursuant to Section 34.076 Missouri Revised Statutes and Cumulative Supplements, a preference shall be given to those persons doing business as Missouri firms, corporations, or individuals, or which maintain Missouri offices or places of business, when the quality of performance promised is equal or better and the price quoted is the same or less. In addition, in order for a non-domiciliary bidder to be successful, his bid must be that same percentage lower than a domiciliary Missouri bidder's bid, as would be required for a Missouri bidder to successfully bid in the non-domiciliary state.
- C. In accordance with the Missouri Domestic Products Procurement Act Section 34.350 RSMo and Cumulative Supplements any manufactured goods or commodities used or supplied in the performance of this contract or any subcontract thereto shall be manufactured, assembled or produced in the United States, unless the specified products are not manufactured, assembled or produced in the United States in sufficient quantities to meet the agency's requirements or cannot be manufactured, assembled or produced in the United States within the necessary time in sufficient quantities to meet the contract requirements, or if obtaining the specified products manufactured, assembled or produced in the United States would increase the cost of this contract for purchase of the product by more than ten percent.

ARTICLE 1.8 - COMMUNICATIONS

- A. All notices, requests, instructions, approvals, and claims must be in writing and shall be delivered to the Designer and copied to the Construction Representative for the project except as required by Article 1.12 Disputes and Disagreements, or as otherwise specified by the Owner in writing as stated in Section 012600. Any such notice shall be deemed to have been given as of the time of actual receipt.
- B. The Contractor shall attend on-site progress and coordination meetings, as scheduled by the Construction Representative, no less than once a month.

- C. The Contractor shall ensure that major subcontractors and suppliers shall attend monthly progress meetings as necessary to coordinate the work, and as specifically requested by the Construction Representative.

ARTICLE 1.9 - SEPARATE CONTRACTS AND COOPERATION

- A. The Owner reserves the right to let other contracts in connection with this work. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work and shall properly connect and coordinate his work with theirs.
- B. The Contractor shall consult the drawings for all other contractors in connection with this work. Any work conflicting with the above shall be brought to the attention of the Owner's Representative before the work is performed. If the Contractor fails to do this, and constructs any work which interferes with the work of another contractor, the Contractor shall remove any part so conflicting and rebuild same, as directed by the Owner's Representative at no additional cost to the Owner.
- C. Each contractor shall be required to coordinate his work with other contractors so as to afford others reasonable opportunity for execution of their work. No contractor shall delay any other contractor by neglecting to perform contract work at the proper time. If any contractor causes delay to another, they shall be liable directly to that contractor for such delay in addition to any liquidated damages which might be due the Owner.
- D. Should the Contractor or project associated subcontractors refuse to cooperate with the instructions and reasonable requests of other Contractors or other subcontractors in the overall coordinating of the work, the Owner may take such appropriate action and issue directions, as required, to avoid unnecessary and unwarranted delays.
- E. Each Contractor shall be responsible for damage done to Owner's or other Contractor's property by him/her or workers in his employ through their fault or negligence.
- F. Should a Contractor sustain any damage through any act or omission of any other Contractor having a contract with the Owner, the Contractor so damaged shall have no claim or cause of action against the Owner for such damage, but shall have a claim or cause of action against the other Contractor to recover any and all damages sustained by reason of the acts or omissions of such Contractor. The phrase "acts or omissions" as used in this section shall be defined to include, but

not be limited to, any unreasonable delay on the part of any such contractors.

ARTICLE 1.10 - ASSIGNMENT OF CONTRACT

- A. No assignment by Contractor of any amount or any part of this contract or of the funds to be received there under will be recognized unless such assignment has had the written approval of the Director and the surety has been given due notice of such assignment and has furnished written consent thereto. In addition to the usual recitals in assignment contracts, the following language must be set forth: "It is agreed that the funds to be paid to the assignee under this assignment are subject to performance by the Contractor of this contract and to claims or liens for services rendered or materials supplied for the performance of the work called for in said contract in favor of all persons, firms or corporations rendering such services or supplying such materials."

ARTICLE 1.11 - INDEMNIFICATION

- A. Contractor agrees to indemnify and save harmless Owner and its respective commissioners, officers, officials, agents, consultants and employees and Designer, their agents, servants and employees, from and against any and all liability for damage arising from injuries to persons or damage to property occasioned by any acts or omissions of Contractor, any subcontractors, agents, servants or employees, including any and all expense, legal or otherwise, which may be incurred by Owner or Designer, its agents, servants or employees, in defense of any claim, action or suit.
- B. The obligations of the Contractor under this paragraph shall not extend to the liability of the Designer, his agents or employees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, contract changes, design or specifications, or (2) giving of or the failure to give directions or instructions by the Designer, his agents or employees as required by this contract documents provided such giving or failure to give is the primary cause of the injury or damage.

ARTICLE 1.12 - DISPUTES AND DISAGREEMENTS

It is hereby expressly agreed and understood that in case any controversy or difference of opinion arises during construction, best efforts will be given to resolution at the field level. Should those efforts be unsuccessful, the Contractor has the right to appeal in writing, the decision of the Director's Designee to the Director at Room 730 Truman Building, P.O. Box 809, Jefferson City, Missouri 65102. The decision of the Director shall be final and binding on all parties.

ARTICLE 2 -- OWNER/DESIGNER RESPONSIBILITIES

- A. The Owner shall give all orders and directions contemplated under this contract relative to the execution of the work. During progress of work the Owner will be represented at the project site by the Construction Representative and/or Designer, whose responsibilities are to see that this contract is properly fulfilled.
- B. The Owner shall at all times have access to the work whenever it is in preparation or progress. The Contractors shall provide proper facilities for such access and for inspection and supervision.
- C. All materials and workmanship used in the work shall be subject to the inspection of the Designer and Construction Representative, and any work which is deemed defective shall be removed, rebuilt or made good immediately upon notice. The cost of such correction shall be borne by the Contractor. Contractor shall not be entitled to an extension of the contract completion date in order to remedy defective work. All rejected materials shall be immediately removed from the site of the work.
- D. If the Contractor fails to proceed at once with the correction of rejected defective materials or workmanship, the Owner may, by separate contract or otherwise, have the defects remedied or rejected. Materials removed from the site and charge the cost of the same against any monies which may be due the Contractor, without prejudice to any other rights or remedies of the Owner.
- E. Failure or neglect on the part of Owner to observe faulty work, or work done which is not in accordance with the drawings and specifications shall not relieve the Contractor from responsibility for correcting such work without additional compensation.
- F. The Owner shall have the right to direct the Contractor to uncover any completed work.
 - 1. If the Contractor fails to adequately notify the Construction Representative and/or Designer of an inspection as required by the Contract Documents, the Contractor shall, upon written request, uncover the work. The Contractor shall bear all costs associated with uncovering and again covering the work exposed.
 - 2. If the Contractor is directed to uncover work, which was not otherwise required by the Contract Documents to be inspected, and the work is found to be defective in any respect, no compensation shall be allowed for this work. If, however, such work is found to meet

the requirements of this contract, the actual cost of labor and material necessarily involved in the examination and replacement plus 10% shall be allowed the Contractor.

- G. The Designer shall give all orders and directions contemplated under this contract relative to the scope of the work and shall give the initial interpretation of the contract documents.
- H. The Owner may file a written notice to the Contractor to dismiss immediately any subcontractors, project managers, superintendents, foremen, workers, watchmen or other employees whom the Owner may deem incompetent, careless or a hindrance to proper or timely execution of the work. The Contractor shall comply with such notice as promptly as practicable without detriment to the work or its progress.
- I. If in the Owner's judgment it becomes necessary at any time to accelerate work, when ordered by the Owner in writing, the Contractor shall redirect resources to such work items and execute such portions of the work as may be required to complete the work within the current approved contract schedule.

ARTICLE 3 -- CONTRACTOR RESPONSIBILITIES

The Contractor shall register and utilize the Owner's eBuilder digital project management system for submission of documents described in the following sections. This includes but is not limited to submittals as required by designer, payment applications, Request for Information (RFI), construction change orders, Request for Proposals (RFP), Designer Supplemental Instructions (DSI), etc.

ARTICLE 3.1 -- ACCEPTABLE SUBSTITUTIONS

- A. The Contractor may request use of any article, device, product, material, fixture, form or type of construction which in the judgment of the Owner and Designer is equal in all respects to that named. Standard products of manufacturers other than those specified will be accepted when, prior to the ordering or use thereof, it is proven to the satisfaction of the Owner and Designer that they are equal in design, strength, durability, usefulness and convenience for the purpose intended.
- B. Any changes required in the details and dimensions indicated on the drawings for the substitution of products other than those specified shall be properly made at the expense of the Contractor requesting the substitution or change.
- C. The Contractor shall submit a request for such substitutions in writing to the Owner and Designer within twenty (20) working days after the date of

the "Notice to Proceed." Thereafter no consideration will be given to alternate forms of accomplishing the work. This Article does not preclude the Owner from exercising the provisions of Article 4 hereof.

- D. Any request for substitution by the Contractor shall be submitted in accordance with SECTION 002113 - INSTRUCTIONS TO BIDDERS.
- E. When a material has been approved, no change in brand or make will be permitted unless:
 - 1. Written verification is received from the manufacturer stating they cannot make delivery on the date previously agreed, or
 - 2. Material delivered fails to comply with contract requirements.

ARTICLE 3.2 -- SUBMITTALS

- A. The Contractor's submittals must be submitted with such promptness as to allow for review and approval so as not to cause delay in the work. The Contractor shall coordinate preparation and processing of submittals with performance of construction activities.

Coordinate each submittal with fabrication, = purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

Submit four (4) copies to the Designer and additional copies as required for the subcontractors and material suppliers. Also provide copies to meet the requirements for maintenance manuals.

- B. All subcontractors' shop drawings and schedules shall be submitted by the Contractor and shall bear evidence that Contractor has received, reviewed, and approved them. Any shop drawings and schedules submitted without this evidence will be returned to the Contractor for resubmission.
- C. The Contractor shall include with the shop drawing, a letter indicating any and all deviations from the drawings and/or specifications. Failure to notify the Designer of such deviations will be grounds for subsequent rejection of the related work or materials. If, in the opinion of the Designer, the deviations are not acceptable, the Contractor will be required to furnish the item as specified and indicated on the drawings.
- D. The Designer shall check shop drawings and schedules with reasonable promptness and approve them only if they conform to the design concept of the project and comply with the information given in the contract documents. The approval shall not relieve the Contractor from the responsibility to comply with the drawings and specifications, unless the Contractor has called the Designer's attention to the deviation, in writing, at the time of

submission and the Designer has knowingly approved thereof. An approval of any such modification will be given only under the following conditions:

1. It is in the best interest of the Owner
 2. It does not increase the contract sum and/or completion time
 3. It does not deviate from the design intent
 4. It is without prejudice to any and all rights under the surety bond.
- E. No extension of time will be granted because of the Contractor's failure to submit shop drawings and schedules in ample time to allow for review, possible resubmission, and approval. Fabrication of work shall not commence until the Contractor has received approval. The Contractor shall furnish prints of approved shop drawings and schedules to all subcontractors whose work is in any way related to the work under this contract. Only prints bearing this approval will be allowed on the site of construction
- F. The Contractor shall maintain a complete file on-site of approved shop drawings available for use by the Construction Representative.

ARTICLE 3.3 – AS-BUILT DRAWINGS

- A. The Contractor shall update a complete set of the construction drawings, shop drawings and schedules of all work monthly by marking changes, and at the completion of their work (prior to submission of request for final payment) note all changes and turn the set over to the Construction Representative. The updates shall show all addenda, all field changes that were made to adapt to field conditions, changes resulting from contract changes or supplemental instructions, and all locations of structures, buried installations of piping, conduit, and utility services. All buried and concealed items both inside and outside shall be accurately located as to depth and referenced to permanent features such as interior or exterior wall faces and dimensions shall be given in a neat and legible manner in a contrasting colored pencil or ink. If approved by the Designer, an electronic file format may be provided.

ARTICLE 3.4 – GUARANTY AND WARRANTIES

- A. General Guaranty
1. Neither the final certificate of payment nor any provision in the contract documents nor partial use or occupancy of the premises by the Owner shall constitute an acceptance of work not done in accordance with contract requirements.

2. The Contractor or surety shall remedy any defects in the work and pay for any damage to property resulting there from which shall appear within a period of one (1) year from the date of substantial completion unless a longer period is otherwise specified or a differing guaranty period has been established in the substantial completion certificate. The Owner will give notice of observed defects with reasonable promptness.
3. In case of default on the part of the Contractor in fulfilling this part of this contract, the Owner may correct the work or repair the damage and the cost and expense incurred in such event shall be paid by or recoverable from the Contractor or surety.
4. The work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Contractor's guaranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by the Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment

B. Extended Warranty

Manufacturer's certificates of warranty shall be obtained for all major equipment. Warranty shall be obtained for at least one year. Where a longer period is offered at no additional cost or called for in the specific equipment specifications, the longer period shall govern.

ARTICLE 3.5 -- OPERATION AND MAINTENANCE MANUALS

- A. Immediately after equipment submittals are approved and no later than ten (10) working days prior to the substantial completion inspection, the Contractor shall provide to the Designer three (3) copies of operating instructions and service manuals, containing the following:
1. Start-up and Shut-down Procedures: Provide a step-by-step write up of all major equipment. When manufacturer's printed start-up, trouble shooting and shut-down procedures are available; they may be incorporated into the operating manual for reference.

2. Operating Instructions: Written operating instructions shall be included for the efficient and safe operation of all equipment.
 3. Equipment List: List of all major equipment as installed shall be prepared to include model number, capacities, flow rate, name plate data, shop drawings and air and water balance reports.
 4. Service Instructions: Provide the following information for all pieces of equipment.
 - a. Recommended spare parts including catalog number and name of local supplier or factory representative.
 - b. Belt sizes, types, and lengths.
 - c. Wiring diagrams.
 5. Manufacturer's Certificate of Warranty as described in Article 3.4.
 6. Prior to the final payment, furnish to the Designer three (4) copies of parts catalogs for each piece of equipment furnished by him/her on the project with the components identified by number for replacement ordering.
- B. Submission of operating instructions shall be done in the following manner.
1. Manuals shall be in quadruplicate, and all materials shall be bound into volumes of standard 8½" x 11" hard binders. Large drawings too bulky to be folded into 8½" x 11" shall be separately bound or folded and in envelopes, cross referenced and indexed with the manuals.
 2. The manuals shall identify project name, project number, and include the name and address of the Contractor, subcontractors and manufacturers who were involved with the activity described in that particular manual.
 3. Internally subdivide the binder contents with permanent page dividers, logically organized with tab titles clearly printed under reinforced laminated plastic tabs.
 4. Contents: Prepare a Table of Contents for each volume, with each product or system description identified.

ARTICLE 3.6 – OTHER CONTRACTOR RESPONSIBILITIES

- A. The Contractor shall keep on site, during progress of the work, a competent superintendent satisfactory to the Construction Representative. The superintendent shall represent the Contractor and all agreements made by the superintendent shall be binding. The superintendent shall

carefully study and compare all drawings, specifications and other instructions and shall promptly notify the Construction Representative and Designer, in writing, any error, inconsistency or omission which may be discovered. The superintendent shall coordinate all work on the project. Any change of the superintendent shall be approved by the Construction Representative.

- B. Contractor shall, at all times, enforce strict discipline and good order among his employees, and shall not employ on the work any unfit person or anyone not skilled in the work assigned to him/her.
- C. The Contractor shall supply sufficient labor, material, plant and equipment and pay when due any laborer, subcontractor or supplier for supplies furnished and otherwise prosecute the work with diligence to prevent work stoppage and ensure completion thereof within the time specified.
- D. The Contractor and each of his subcontractors shall submit to the Construction Representative, through the Designer such schedules of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data as the Owner may request concerning work performed or to be performed under this contract.
- E. The Contractor, subcontractors, and material suppliers shall upon written request, give the Owner access to all time cards, material invoices, payrolls, estimates, profit and loss statements, and all other direct or indirect costs related to this work.
- F. The Contractor shall be responsible for laying out all contract work such as layout of architectural, structural, mechanical and electrical work, which shall be coordinated with layouts of subcontractors for general construction work. The Contractor is also responsible for unloading, uncrating and handling of all materials and equipment to be erected or placed by him/her, whether furnished by Contractor or others. No extra charges or compensation will be allowed as a result of failure to verify dimensions before ordering materials or fabricating items.
- G. The Contractor must notify the Construction Representative at least one working day before placing concrete or burying underground utilities, pipelines, etc.
- H. Contractors shall prearrange time with the Construction Representative for the interruption of any facility operation. Unless otherwise specified in these documents, all connections, alterations or relocations as well as all other portions of the work will be performed during normal working hours.

- I. The Contractor shall coordinate all work so there will not be prolonged interruptions of existing equipment operation. Any existing plumbing, heating, ventilating, air conditioning or electrical disconnections necessary for the project, which affect portions of this construction or building or any other building must be scheduled with the Construction Representative to minimize or avoid any disruption of facility operations. In no case, unless previously approved in writing by the Construction Representative, shall utilities be left disconnected at the end of a work day or over a weekend. Any interruption of utilities either intentionally or accidentally shall not relieve the Contractor responsible for the interruption from the responsibility to repair and restore the utility to normal service. Repairs and restoration shall be made before the workers responsible for the repair and restoration leave the job.
- J. Contractors shall limit operations and storage of materials to the area within the project, except as necessary to connect to existing utilities, and shall not encroach on neighboring property. The Contractor shall be responsible for repair of their damage to property on or off the project site occurring during construction of project. All such repairs shall be made to the satisfaction of the property owner.
- K. Unless otherwise permitted, all materials shall be new and both workmanship and materials shall be of the best quality.
- L. Unless otherwise provided and stipulated within these specifications, the Contractor shall furnish, construct, and/or install and pay for materials, devices, mechanisms, equipment, all necessary personnel, utilities including, but not limited to water, heat, light and electric power, transportation services, applicable taxes of every nature, and all other facilities necessary for the proper execution and completion of the work.
- M. Contractor shall carefully examine the plans and drawings and shall be responsible for the proper fitting of his material, equipment and apparatus into the building.
- N. The Contractor or subcontractors shall not overload, or permit others to overload, any part of any structure during the performance of this contract.
- O. All temporary shoring, bracing, etc., required for the removal of existing work and/or for the installation of new work shall be included in this contract. The Contractor shall make good, at no cost to the Owner, any damage caused by improper support or failure of shoring in any respect. Each Contractor shall be responsible for shoring required to protect his work or adjacent property and improvements of Owner and shall be responsible for shoring or for giving written notice to adjacent property owners. Shoring shall be removed only after completion of permanent supports.
- P. The Contractor shall provide at the proper time such material as is required for support of the work. If openings are required, whether shown on drawings or not, the Contractor shall see that they are properly constructed.
- Q. During the performance of work the Contractor shall be responsible for providing and maintaining warning signs, lights, signal devices, barricades, guard rails, fences and other devices appropriately located on site which will give proper and understandable warning to all persons of danger of entry onto land, structure or equipment.
- R. The Contractor shall be responsible for protection, including weather protection, and proper maintenance of all equipment and materials.
- S. The Contractor shall be responsible for care of the finished work and shall protect same from damage or defacement until substantial completion by the Owner. If the work is damaged by any cause, the Contractor shall immediately begin to make repairs in accordance with the drawings and specifications. Contractor shall be liable for all damage or loss unless attributable to the acts or omissions of the Owner or Designer. Any claim for reimbursement shall be submitted in accordance with Article 4. After substantial completion the Contractor will only be responsible for damage resulting from acts or omissions of the Contractor or subcontractors through final warranty.
- T. In the event the Contractor encounters an unforeseen hazardous material, the Contractor shall immediately stop work in the area affected and report the condition to the Owner and Designer in writing. The Contractor shall not be required, pursuant to Article 4, to perform, any work relating to hazardous materials.
- U. In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 4.
- V. Before commencing work, Contractors shall confer with the Construction Representative and facility representative and review any facility rules and regulations which may affect the conduct of the work.

- W. Project signs will only be erected on major projects and only as described in the specifications. If no sign is specified, none shall be erected.

ARTICLE 3.7 -- SUBCONTRACTS

- A. Subcontractor assignments as identified in the bid form shall not be changed without written approval of the Owner. The Owner will not approve changes of a listed subcontractor unless the Contractor documents, to the satisfaction of the Owner that the subcontractor cannot or will not perform the work as specified.
- B. The Contractor is fully responsible to the Owner for the acts and omissions of all subcontractors and of persons either directly or indirectly employed by them.
- C. Every subcontractor shall be bound by the applicable terms and provisions of these contract documents, but no contractual relationship shall exist between any subcontractor and the Owner unless the right of the Contractor to proceed with the work is suspended or this contract is terminated as herein provided, and the Owner in writing elects to assume the subcontract.
- D. The Contractor shall upon receipt of "Notice to Proceed" and prior to submission of the first payment request, notify the Designer and Construction Representative in writing of the names of any subcontractors to be used in addition to those identified in the bid form and all major material suppliers proposed for all parts of the work.

ARTICLE 4 -- CHANGES IN THE WORK

4.1 CHANGES IN THE WORK

- A. The Construction Representative, without giving notice to the surety and without invalidating this contract, may order extra work or make changes by altering, adding to or deducting from the work, this contract sum being adjusted accordingly. All such work shall be executed under the conditions of the original contract. A claim for extension of time caused by any change must be adjusted at the time of ordering such change. No future request for time will be considered.
- B. Each Contract Change shall include all costs required to perform the work including all labor, material, equipment, overheads and profit, delay, disruptions, or other miscellaneous expenses. No subsequent requests for additional compensation including claims for delay, disruption, or reduced efficiency as a result of each change will be considered. Values from the Schedule of Values will not be binding as a basis for additions to or deductions from the contract price.

- C. The amount of any adjustment in this contract price for authorized changes shall be agreed upon before such changes become effective and shall be determined, through submission of a request for proposal, as follows:

1. By an acceptable fixed price proposal from the Contractor. Breakdowns shall include all takeoff sheets of each Contractor and subcontractor. Breakdown shall include a listing of each item of material with unit prices and number of hours of labor for each task. Labor costs per hour shall be included with labor burden identified, which shall be not less than the prevailing wage rate, etc. Overhead and profit shall be shown separately for each subcontractor and the Contractor.
2. By a cost-plus-fixed-fee (time and material) basis with maximum price, total cost not to exceed said maximum. Breakdown shall include a listing of each item of material with unit prices and number of hours of labor for each task. Labor costs per hour shall be included with labor burden identified, which shall be not less than the prevailing wage rate, etc. Overhead and profit shall be shown separately for each subcontractor and the Contractor.
3. By unit prices contained in Contractor's original bid form and incorporated in the construction contract.

- D. Overhead and Profit on Contract Changes shall be applied as follows:

1. The overhead and profit charge by the Contractor and all subcontractors shall be considered to include, but is not limited to: incidental job burdens, small truck (under 1 ton) expense, mileage, small hand tools, warranty costs, company benefits and general office overhead. Project supervision including field supervision and job site office expense shall be considered a part of overhead and profit unless a compensable time extension is granted.
2. The percentages for overhead and profit charged on Contract Changes shall be subject to the following limits: (a) the percentage mark-up for the Contractor shall be limited to the Contractor's fee; (b) fifteen percent (15%) maximum for Work directly performed by employees of a subcontractor, or sub-subcontractor; (c) five percent (5%) maximum for the Work performed or passed through to the Owner by the Contractor; (d) five percent (5%) maximum subcontractor's mark-up for

Work performed by a sub-subcontractor and passed through to the Owner by the subcontractor and Contractor; and (e) in no case shall the total overhead and profit paid by the Owner on any Contract Changes exceed twenty-five percent (25%) of the cost of materials, labor and equipment (exclusive of Contractor or any Subcontractor overhead and profit) necessary to put the contract change work in place.

3. The Contractor will be allowed to add the cost of Contractor's payment and performance bonding, builder's risk insurance, and general liability insurance to their cost of work. The above listed bonding and insurance cost shall not exceed two percent (2%) and shall be allowed on the total cost of the added work, including overhead and profit.
 4. On proposals covering both increases and decreases in the amount of this contract, the application of overhead and profit shall be on the net change in the cost of the work.
 5. The percentage(s) for overhead and profit to be credited to the Owner on Contract Changes that are solely decreases in the quantity of work or materials shall be the same as those for additive Contract Changes provided above.
- E. No claim for an addition to this contract sum shall be valid unless authorized as aforesaid in writing by the Owner. In the event that none of the foregoing methods are agreed upon, the Owner may order the Contractor to perform work on a time and material basis. The cost of such work shall be determined by the Contractor's actual labor and material cost to perform the work plus overhead and profit as outlined herein. The Designer and Construction Representative shall approve the Contractor's daily time and material invoices for the work involved.
- F. If the Contractor claims that any instructions involve extra cost under this contract, the Contractor shall give the Owner's Representative written notice thereof within a reasonable time after the receipt of such instructions, and in any event before proceeding to execute the work. No such claim shall be valid unless so made and authorized by the Owner, in writing.
- G. In an emergency affecting the safety of life or of the structure or of adjoining property, the Contractor, without special instruction or authorization from the Construction Representative, is hereby permitted to act at their discretion to prevent such threatened loss or injury. The Contractor shall submit a claim for compensation for such emergency work in writing to the Owner's Representative.

ARTICLE 4.2 – CHANGES IN COMPLETION TIME

- A. Extension of the number of work days stipulated in the Contract for completion of the work with compensation may be made when:
1. The contractor documents that proposed Changes in the work, as provided in Article 4.1, extends construction activities critical to contract completion date, OR
 2. The Owner suspends all work for convenience of the Owner as provided in Article 7.3, OR
 3. An Owner caused delay extends construction activities critical to contract completion (except as provided elsewhere in these General Conditions). The Contractor is to review the work activities yet to begin and evaluate the possibility of rescheduling the work to minimize the overall project delay.
- B. Extension of the number of work days stipulated in the Contract for completion of the work without compensation may be made when:
1. Weather-related delays occur, subject to provisions for the inclusion of a specified number of "bad weather" days when provided for in Section 012100-Allowances, OR
 2. Labor strikes or acts of God occur, OR
 3. The work of the Contractor is delayed on account of conditions which were beyond the control of the Contractor, subcontractors or suppliers, and were not the result of their fault or negligence.
- C. No time extension or compensation will be provided for delays caused by or within the control of the Contractor, subcontractors or suppliers and for concurrent delays caused by the Owner.
- D. The Contractor shall notify the Owner promptly of any occurrence or conditions which in the Contractor's opinion results in a need for an extension of time. The notice shall be in writing and shall include all necessary supporting materials with details of any resultant costs and be submitted in time to permit full investigation and evaluation of the Contractor's claim. The Owner shall promptly acknowledge the Contractor's notice and, after recommendation from the Owner's Representative and/or Designer, shall provide a decision to the Contractor. Failure on the part of the Contractor to provide such notice and to detail the costs shall constitute a waiver by the Contractor of any claim. Requests for extensions of time shall be for working days only.

ARTICLE 5 - CONSTRUCTION AND COMPLETION

ARTICLE 5.1 – CONSTRUCTION COMMENCEMENT

A. Upon receipt of the "Intent to Award" letter, the Contractor must submit the following properly executed instruments to the Owner:

1. Contract;
2. Performance/payment bond as described in Article 6.1;
3. Certificates of Insurance, or the actual policies themselves, showing that the Contractor has obtained the insurance coverage required by Article 6.2.

Above referenced items must be received by the Owner within ten (10) working days after the effective date of the contract. If not received, the Owner may treat the failure to timely submit them as a refusal by the Contractor to accept a contract for this work and may retain as liquidated damages the Contractor's bid bond, cashier's check or certified check as provided in the Instructions to Bidders. Upon receipt the Owner will issue a "Notice to Proceed" with the work to the Contractor.

B. Within the time frame noted in Section 013200 - Schedules, following receipt of the "Notice to Proceed", the Contractor shall submit to the Owner a progress schedule and schedule of values, showing activities through the end of the contract period. Should the Contractor not receive written notification from the Owner of the disapproval of the schedule of values within fifteen (15) working days, the Contractor may consider it approved for purpose of determining when the first monthly Application and Certification for Payment may be submitted.

C. The Contractor may commence work upon receipt of the Division of Facilities Management, Design and Construction's "Notice to Proceed" letter. Contractor shall prosecute the work with faithfulness and energy, and shall complete the entire work on or before the completion time stated in the contract documents or pay to the Owner the damages resulting from the failure to timely complete the work as set out within Article 5.4.

ARTICLE 5.2 -- PROJECT CONSTRUCTION

A. Each Contractor shall submit for the Owner's approval, in reproducible form, a progress schedule showing the rate of progress and the order of the work proposed to carry on various phases of the project. The schedule shall be in conformance

with the requirements outlined in Section 013200 – Schedules.

B. Contractor shall employ and supply a sufficient force of workers, material, and equipment and shall pay when due, any worker, subcontractor or supplier and otherwise prosecute the work with such diligence so as to maintain the rate of progress indicated on the progress schedule, prevent work stoppage, and insure completion of the project within the time specified.

ARTICLE 5.3 -- PROJECT COMPLETION

A. Substantial Completion. A Project is substantially complete when construction is essentially complete and work items remaining to be completed can be done without interfering with the Owner's ability to use the Project for its intended purpose.

1. Once the Contractor has reached what they believe is Substantial Completion, the Contractor shall notify the Designer and the Construction Representative of the following:
 - a. That work is essentially complete with the exception of certain listed work items. The list shall be referred to as the "Contractor's Punch."
 - b. That all Operation and Maintenance Manuals have been assembled and submitted in accordance with Article 3.5A.
 - c. That the Work is ready for inspection by the Designer and Construction Representative. The Owner shall be entitled to a minimum of ten working days notice before the inspection shall be performed.
2. If the work is acceptable, the Owner shall issue a Certificate of Substantial Completion, which shall set forth the responsibilities of the Owner and the Contractor for utilities, security, maintenance, damage to the work and risk of loss. The Certificate shall also identify those remaining items of work to be performed by the Contractor. All such work items shall be complete within 30 working days of the date of the Certificate, unless the Certificate specifies a different time. If the Contractor shall be required to perform tests that must be delayed due to climatic conditions, it is understood that such tests and affected equipment will be identified on the Certificate and shall be accomplished by the Contractor at the earliest possible date. Performance of the tests may not be required before Substantial Completion can be issued. The date of the issuance of the Certificate of

Substantial Completion shall determine whether or not the work was completed within the contract time and whether or not Liquidated Damages are due.

3. If the work is not acceptable, and the Owner does not issue a Certificate of Substantial Completion, the Owner shall be entitled to charge the Contractor with the Designer's and Owner's costs of re-inspection, including time and travel.
- B. Partial Occupancy. Contractor agrees that the Owner shall be permitted to occupy and use any completed or partially completed portions of the Project, when such occupancy and use is in the Owner's best interest. Owner shall notify Contractor of its desire and intention to take Partial Occupancy as soon as possible but at least ten (10) working days before the Owner intends to occupy. If the Contractor believes that the portion of the work the Owner intends to occupy is not ready for occupancy, the Contractor shall notify the Owner immediately. The Designer shall inspect the work in accordance with the procedures above. If the Contractor claims increased cost of the project or delay in completion as a result of the occupancy, he shall notify the Owner immediately but in all cases before occupancy occurs.
- C. Final Completion. The Project is finally complete when the Certificate of Substantial Completion has been issued and all work items identified therein as incomplete have been completed, and when all administrative items required by the contract have been completed. Final Completion entitles the Contractor to payment of the outstanding balance of the contract amount including all change orders and retainage. Within five (5) working days of the date of the Certificate of Substantial Completion, the Contractor shall identify the cost to complete any outstanding items of work. The Designer shall review the Contractor's estimate and either approve it or provide an independent estimate for all such items. If the Contractor fails to complete the remaining items within the time specified in the Certificate, the Owner may terminate the contract and go to the surety for project completion in accordance with Article 7.2 or release the contract balance to the Contractor less 150% of the approved estimate to complete the outstanding items. Upon completion of the outstanding items, when a final cost has been established, any monies remaining shall be paid to the Contractor. Failure to complete items of work does not relieve the Contractor from the obligation to complete the administrative requirements of the contract, such as the provisions of Article 5.3 FAILURE TO COMPLETE ALL ITEMS OF WORK UNDER THE CONTRACT SHALL BE CONSIDERED A

DEFAULT AND BE GROUNDS FOR CONTRACT TERMINATION AND DEBARMENT.

- D. Liquidated Damages. Contractor agrees that the Owner may deduct from the contract price and retain as liquidated damages, and not as penalty or forfeiture, the sum stipulated in this contract for each work day after the Contract Completion Day on which work is not Substantially Complete. Assessment of Liquidated Damages shall not relieve the Contractor or the surety of any responsibility or obligation under the Contract. In addition, the Owner may, without prejudice to any other rights, claims, or remedies the Owner may have including the right to Liquidated Damages, charge the Contractor for all additional expenses incurred by the Owner and/or Designer as the result of the extended contract period through Final Completion. Additional Expenses shall include but not be limited to the costs of additional inspections.
- E. Early Completion. The Contractor has the right to finish the work before the contract completion date; however, the Owner assumes no liability for any hindrances to the Contractor unless Owner caused delays result in a time extension to the contract completion date. The Contractor shall not be entitled to any claims for lost efficiencies or for delay if a Certificate of Substantial Completion is given on or before the Contract Completion Date.

ARTICLE 5.4 -- PAYMENT TO CONTRACTOR

- A. Payments on account of this contract will be made monthly in proportion to the work which has been completed. Request for payment must be submitted on the Owner's forms. No other pay request will be processed. Supporting breakdowns must be in the same format as Owner's forms and must provide the same level of detail. The Designer will, within 5 working days from receipt of the contractor's request for payment either issue a Certificate for Payment to the Owner, for such amount as the Designer determines is properly due, or notify the Contractor in writing of reasons for withholding a Certificate. The Owner shall make payment within 30 calendar days after the "Application and Certification for Payment" has been received and certified by the Designer. The following items are to be attached to the contractor's pay request:
 1. Updated construction schedule
 2. Certified payrolls consisting of name, occupation and craft, number of hours worked and actual wages paid for each individual employee, of the Contractor and all subcontractors working on the project

- B. The Owner shall retain 5 percent of the amount of each such payment application, except as allowed by Article 5.4, until final completion and acceptance of all work covered by this contract.
- C. Each payment made to Contractor shall be on account of the total amount payable to Contractor and all material and work covered by paid partial payment shall thereupon become the sole property of Owner. This provision shall not be construed as relieving Contractor from sole responsibility for care and protection of materials and work upon which payments have been made or restoration of any damaged work or as a waiver of the right of Owner to require fulfillment of all terms of this contract.
- D. Materials delivered to the work site and not incorporated in the work will be allowed in the Application and Certification for Payment on the basis of one hundred (100%) percent of value, subject to the 5% retainage providing that they are suitably stored on the site or in an approved warehouse in accordance with the following requirements:
1. Material has previously been approved through submittal and acceptance of shop drawings conforming to requirements of Article 3.2 of General Conditions.
 2. Delivery is made in accordance with the time frame on the approved schedule.
 3. Materials, equipment, etc., are properly stored and protected from damage and deterioration and remain so - if not, previously approved amounts will be deleted from subsequent pay applications.
 4. The payment request is accompanied by a breakdown identifying the material equipment, etc. in sufficient detail to establish quantity and value.
- E. The Contractor shall be allowed to include in the Application and Certification for Payment, one hundred (100%) of the value, subject to retainage, of major equipment and material stored off the site if all of the following conditions are met:
1. The request for consideration of payment for materials stored off site is made at least 15 working days prior to submittal of the Application for Payment including such material. Only materials inspected will be considered for inclusion on Application for Payment requests.
 2. Materials stored in one location off site are valued in excess of \$25,000.
 3. That a Certificate of Insurance is provided indicating adequate protection from loss, theft

conversion or damage for materials stored off site. This Certificate shall show the State of Missouri as an additional insured for this loss.

4. The materials are stored in a facility approved and inspected, by the Construction Representative.
 5. Contractor shall be responsible for, Owner costs to inspect out of state facilities, and any delays in the completion of the work caused by damage to the material or for any other failure of the Contractor to have access to this material for the execution of the work.
- F. The Owner shall determine the amount, quality and acceptability of the work and materials which are to be paid for under this contract. In the event any questions shall arise between the parties, relative to this contract or specifications, determination or decision of the Owner or the Construction Representative and the Designer shall be a condition precedent to the right of the Contractor to receive any money or payment for work under this contract affected in any manner or to any extent by such question.
- G. Payments Withheld: The Owner may withhold or nullify in whole or part any certificate to such extent as may be necessary to protect the Owner from loss on account of:
1. Defective work not remedied. When a notice of noncompliance is issued on an item or items, corrective action shall be undertaken immediately. Until corrective action is completed, no monies will be paid and no additional time will be allowed for the item or items. The cost of corrective action(s) shall be borne by the Contractor.
 2. A reasonable doubt that this contract can be completed for the unpaid balance.
 3. Failure of the Contractor to update as-built drawings monthly for review by the Construction Representative.
 4. Failure of the Contractor to update the construction schedule.
- When the Construction Representative is satisfied the Contractor has remedied above deficiencies, payment shall be released.
- H. Final Payment: Upon receipt of written notice from the Contractor to the Designer and Project Representative that the work is ready for final inspection and acceptance, the Designer and Project Representative, with the Contractor, shall promptly make such inspection. If the work is acceptable and the contract fully performed, the Construction Representative shall complete a final acceptance report and the Contractor will be

directed to submit a final Application and Certification for Payment. If the Owner approves the same, the entire balance shall be due and payable, with the exception of deductions as provided for under Article 5.4.

1. Where the specifications provide for the performance by the Contractor of (certain tests for the purpose of balancing and checking the air conditioning and heating equipment and the Contractor shall have furnished and installed all such equipment in accordance with the specifications, but said test cannot then be made because of climatic conditions, such test shall may be considered as required under the provisions of the specifications, Section 013300 and this contract may be substantial Full payment will not be made until the tests have been made and the equipment and system is finally accepted. If the tests are not completed when scheduled, the Owner may deduct 150% of the value of the tests from the final payment.
2. The final payment shall not become due until the Contractor delivers to the Construction Representative:
 - a) A complete file of releases, on the standard form included in the contract documents as "Final Receipt of Payment and Release Form", from subcontractors and material suppliers evidencing payment in full for services, equipment and materials, as the case may require, if the Owner approves, or a consent from the Surety to final payment accepting liability for any unpaid amounts.
 - b) An Affidavit of Compliance with Prevailing Wage Law, in the form as included in this contract specifications, properly executed by each subcontractor, and the Contractor
 - c) Certified copies of all payrolls
 - d) As-built drawings
3. If any claim remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all monies that the latter may be compelled to pay in discharging such a claim including all costs and a reasonable attorney's fee.
4. Missouri statute requires prompt payment from the Owner to the Contractor within thirty calendar days and from the Contractor to his subcontractors within fifteen calendar days. Failure to make payments within the required

time frame entitles the receiving party to charge interest at the rate of one and one half percent per month calculated from the expiration of the statutory time period until paid.

5. The value of all unused unit price allowances and/or 150% of the value of the outstanding work items, and/or liquidated damages may be deducted from the final pay request without executing a Contract Change. Any unit price items which exceed the number of units in the contract may be added by Contract Change.

ARTICLE 6 -- INSURANCE AND BONDS

ARTICLE 6.1 -- BOND

- A. Contractor shall furnish a performance/payment bond in an amount equal to 100% of the contract price to guarantee faithful performance of the contract and 100% of the contract price to guarantee the payment of all persons performing labor on the project and furnishing materials in connection therewith under this contract as set forth in the standard form of performance and payment bond included in the contract documents. The surety on such bond shall be issued by a surety company authorized by the Missouri Department of Insurance to do business in the state of Missouri.
- B. All Performance/Payment Bonds furnished in response to this provision shall be provided by a bonding company with a rating of B+ or higher as established by A.M. Best Company, Inc. in their most recent publication.

ARTICLE 6.2 – INSURANCE

A. The successful Contractor shall procure and maintain for the duration of the contract issued a policy or policies of insurance for the protection of both the Contractor and the Owner and their respective officers, officials, agents, consultants and employees. The Owner requires certification of insurance coverage from the Contractor prior to commencing work.

B. Minimum Scope and Extent of Coverage

1. General Liability

Commercial General Liability, ISO coverage form number or equivalent CG 00 01 ("occurrence" basis), or I-SO coverage form number CG 00 02, or ISO equivalent.

If ISO equivalent or manuscript general liability coverage forms are used, minimum coverage will be as follows: Premises/Operations; Independent Contractors; Products/Completed Operations; personal injury; Broad Form Property Damage including Completed Operations; Broad Form Contractual Liability Coverage to include Contractor's obligations under Article 1.11 Indemnification and any other Special Hazards required by the work of the contract.

2. Automobile Liability

Business Automobile Liability Insurance, ISO Coverage form number or equivalent CA 00 01 covering automobile liability, code 1 "ANY AUTO".

3. Workers' Compensation and Employer's Liability

Statutory Workers' Compensation Insurance for Missouri and standard Employer's Liability Insurance, or the authorization to self-insure for such liability from the Missouri Division of Workers' Compensation.

4. Builder's Risk or Installation Floater Insurance

Insurance upon the work and all materials, equipment, supplies, temporary structures and similar items which may be incident to the performance of the work and located at or adjacent to the site, against loss or damage from fire and such other casualties as are included in extended coverage in broad "All Risk" form, including coverage for Flood and Earthquake, in an amount not less than the replacement cost of the work or this contract price, whichever is greater, with loss payable to Contractor and Owner as their respective interests may appear.

Contractor shall maintain sufficient insurance to cover the full value of the work and materials as the work progresses, and shall furnish Owner copies of all endorsements. If Builder's Risk Reporting- Form of Endorsement is used, Contractor shall make all reports as required therein so as to keep in force an amount of insurance which will equal the replacement cost of the work, materials, equipment, supplies, temporary structures, and other property covered thereby; and if, as a result of Contractor's failure to make any such report, the amount of insurance so recoverable shall be less than such replacement cost, Contractor's interest in the proceeds of such insurance, if any, shall be subordinated to Owner's interest to the end that Owner may receive full reimbursement for its loss.

C. Minimum Limits of Insurance

1. General Liability

Contractor

\$2,000,000	combined single limit per occurrence for bodily injury, personal injury, and property damage
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\$2,000,000	annual aggregate
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2. Automobile Liability

\$2,000,000	combined single limit per occurrence for bodily injury and property damage
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3. Workers' Compensation and Employers Liability

Workers' Compensation limits as required by applicable State Statutes (generally unlimited) and minimum of \$1,000,000 limit per accident for Employer's Liability.

General Liability and Automobile Liability insurance may be arranged under individual policies for the full limits required or by a combination of underlying policies with the balance provided by a form-following Excess or Umbrella Liability policy.

D. Deductibles and Self-Insured Retentions

All deductibles, co-payment clauses, and self-insured retentions must be declared to and approved by the Owner. The Owner reserves the right to request the reduction or elimination of unacceptable deductibles or self-insured retentions, as they would apply to the Owner, and their respective officers, officials, agents, consultants and employees. Alternatively, the Owner may request Contractor to procure a bond guaranteeing

payment of losses and related investigations, claims administration, and defense expenses.

E. Other Insurance Provisions and Requirements

The respective insurance policies and coverage, as specified below, must contain, or be endorsed to contain the following conditions or provisions:

1. General Liability

The Owner, and its respective commissioners, officers, officials, agents, consultants and employees shall be endorsed as additional insured's by ISO form CG 20 26 Additional Insured - Designated Person or Organization. As additional insured's, they shall be covered as to work performed by or on behalf of the Contractor or as to liability which arises out of Contractor's activities or resulting from the performance of services or the delivery of goods called for by the Contract.

Contractor's insurance coverage shall be primary with respect to all additional insured's. Insurance of self-insurance programs maintained by the designated additional -insured's shall be excess of the Contractor's insurance and shall not contribute with it.

Additionally, the Contractor and Contractor's general liability insurer shall agree to waive all rights of subrogation against the Owner and any of their respective officers, officials, agents, consultants or employees for claims, losses, or expenses which arise out of Contractor's activities or result from the performance of services or the delivery of goods called for by the Contract.

Contractor's failure to comply with the terms and conditions of these insurance policies shall not affect or abridge coverage for the Owner, or for any of their officers, officials, agents, consultants or employees.

2. Automobile Insurance

The Owner, and their respective officers, officials, agents, consultants and employees shall be endorsed as additional insured's by ISO form CG 20 26 - Additional Insured Designated Person or Organization. As additional insured's, they shall be covered as to work performed by or on behalf of the Contractor or as to liability which arises out of Contractor's activities or resulting from the performance of services or the delivery of goods called for by the Contract.

Contractor's insurance coverage shall be primary with respect to all additional insured's. Insurance or self-insurance

programs maintained by the designated additional insured's shall be in excess of the Contractor's insurance and shall not contribute with it.

Additionally, the Contractor and Contractor's automobile insurer shall agree to waive all rights of subrogation against the Owner and any of their respective officers, officials, agents, consultants or employees for claims, losses, or expenses which arise out of Contractor's activities or result from the performance of services or the delivery of goods called for by the Contract.

Contractor's failure to comply with the terms and conditions of these insurance policies shall not affect or abridge coverage for the Owner or for any of its officers, officials, agents, consultants or employees.

3. Workers' Compensation/Employer's Liability

Contractor's workers' compensation insurance shall be endorsed with NCCI form WC 00 03 01 A - Alternative Employer Endorsement. The Alternative Employer Endorsement shall designate the Owner as "alternate employers."

4. All Coverages

Each insurance policy required by this section of the Contract shall contain a stipulation, endorsed if necessary, that the Owner will receive a minimum of a thirty (30) calendar day advance notice of any policy cancellation. Ten (10) calendar days advance notice is required for policy cancellation due to non-payment of premium.

F. Insurer Qualifications and Acceptability

Insurance required hereunder shall be issued by an A.M. Best, "B+" rated, Class IX insurance company approved to conduct insurance business in the state of Missouri.

G. Verification of Insurance Coverage

Prior to Owner issuing a Notice to Proceed, the Contractor shall furnish the Owner with Certificate(s) of Insurance and with any applicable original endorsements evidencing the required insurance coverage. The insurance certificates and endorsements are to be signed by a person authorized by that insurer to bind coverage on its behalf. All certificates and endorsements received by the Owner are subject to review and approval by the Owner. The Owner reserves the right to require certified copies of all required policies at any time. If the scope of this contract will exceed one (1) year - or, if any of Contractor's applicable insurance coverage expires prior to completion of the work or services required under this contract -

the Contractor will provide a renewal or replacement certificate before continuing work or services hereunder. If the Contractor fails to provide documentation of required insurance coverage, the Owner may issue a stop work order and no additional contract completion time and/or compensation shall be granted as a result thereof.

ARTICLE 7 – SUSPENSION OR TERMINATION OF CONTRACT

ARTICLE 7.1 - FOR SITE CONDITIONS

When conditions at the site of the proposed work are considered by the Owner to be unsatisfactory for prosecution of the work, the Contractor may be ordered in writing to suspend the work or any part thereof until reasonable conditions exist. When such suspension is not due to fault or negligence of the Contractor, time allowed for completion of such suspended work will be extended by a period of time equal to that lost due to delay occasioned by ordered suspension. This will be a no cost time extension.

ARTICLE 7.2 - FOR CAUSE

A. Termination or Suspension for Cause:

1. If the Contractor shall file for bankruptcy, or should make a general assignment for the benefit of the creditors, or if a receiver should be appointed on account of insolvency, or if the contractor should persistently or repeatedly refuse or fail to supply enough properly skilled workers or proper materials, or if the contractor should fail to make prompt payment to subcontractors or for material or labor, or persistently disregard laws, ordinances or the instructions of the Owner, or otherwise be guilty of a substantial violation of any provision of this contract, then the Owner may serve notice on the Contractor and the surety setting forth the violations and demanding compliance with this contract. Unless within ten (10) consecutive calendar days after serving such notice, such violations shall cease and satisfactory arrangements for correction be made, the Owner may suspend the Contractor's right to proceed with the work or terminate this contract.
2. In the event the Owner suspends Contractor's right to proceed with the work or terminates the contract, the Owner may demand that the Contractor's surety take over and complete the work on this contract, after the surety submits a written proposal to the Owner and receives written approval and upon the surety's failure or refusal to do so within ten (10) consecutive

calendar days after demand therefore, the Owner may take over the work and prosecute the same to completion by bid or negotiated contract, or the Owner may elect to take possession of and utilize in completing the work such materials, supplies, appliances and plant as may be on the site of the work, and all subcontractors, if the Owner elects, shall be bound to perform their contracts.

- B. The Contractor and its surety shall be and remain liable to the Owner for any excess cost or damages occasioned to the Owner as a result of the actions above set forth.
- C. The Contractor in the event of such suspension or termination shall not be entitled to receive any further payments under this contract until the work is wholly finished. Then if the unpaid balance under this contract shall exceed all expenses of the Owner as certified by the Director, such excess shall be paid to the Contractor; but, if such expenses shall exceed the unpaid balance as certified by the Director, the Contractor and their surety shall be liable for and shall pay the difference and any damages to the Owner.
- D. In exercising Owner's right to secure completion of the work under any of the provisions hereof, the Director shall have the right to exercise Owner's sole discretion as to the manner, methods and reasonableness of costs of completing the work.
- E. The rights of the Owner to suspend or terminate as herein provided shall be cumulative and not exclusive and shall be in addition to any other remedy provided by law.
- F. The Contractor in the event of such suspension or termination may be declared ineligible for Owner contracts for a minimal period of twelve (12) months. Further, no contract will be awarded to any Contractor who lists in their bid form any subcontractor whose prior performance has contributed, as determined by the Owner, to a breach of a contract. In order to be considered for state-awarded contracts after this period, the Contractor/subcontractor will be required to forward acceptance reports to the Owner regarding successful completion of non-state projects during the intervening twelve (12) months from the date of default. No contracts will be awarded to a subcontractor/Contractor until the ability to perform responsibly in the private sector has been proven to the Owner.

ARTICLE 7.3 -- FOR CONVENIENCE

- A. The Owner may terminate or suspend the Contract or any portion of the Work without cause at any time, and at the Owner's convenience. Notification of a termination or suspension shall be in writing

and shall be given to the Contractor and their surety. If the Contract is suspended, the notice will contain the anticipated duration of the suspension or the conditions under which work will be permitted to resume. If appropriate, the Contractor will be requested to demobilize and re-mobilize and will be reimbursed time and costs associated with the suspension.

B. Upon receipt of notification, the Contractor shall:

1. Cease operations when directed.
2. Take actions to protect the work and any stored materials.
3. Place no further subcontracts or orders for material, supplies, services or facilities except as may be necessary to complete the portion of the Contract that has not been terminated. No claim for payment of materials or supplies ordered after the termination date shall be considered.
4. Terminate all existing subcontracts, rentals, material, and equipment orders.

5. Settle all outstanding liabilities arising from termination with subcontractors and suppliers.

6. Transfer title and deliver to the Owner, work in progress, completed work, supplies and other material produced or acquire for the work terminated, and completed or partially completed plans, drawings information and other property that, if the Contract had been completed, would be required to be furnished to the Owner.

C. For termination without cause and at the Owner's convenience, in addition to payment for work completed prior to date of termination, the Contractor may be entitled to payment of other documented costs directly associated with the early termination of the contract. Payment for anticipated profit and unapplied overhead will not be allowed.

SECTION 007300 - SUPPLEMENTARY CONDITIONS

1.0 GENERAL:

- A. These Supplementary General Conditions clarify, add, delete, or otherwise modify standard terms and conditions of DIVISION 0, BIDDING AND CONTRACTING REQUIREMENTS.

2.0 CONTACTS:

Designer: Amy Phillips, AIA, NCARB, LEED AP
CannonDesign
120 South Central Ave.,
Clayton, Mo 63105
Telephone: 314-425-8716
Email: aphillips@CANNONDESIGN.COM

MONG Project Manager /
Construction Representative: Michael Howard
Missouri National Guard-CFMO Office
6819a North Boundary Road
Jefferson City, Missouri 65101
Telephone: 636-524-8503
Email: mike.howard@oa.mo.gov

****OR****

Construction Representative: Michael Howard
Division of Facilities Management, Design and Construction
119 Olympic Way
St. Peters, Mo
Telephone: 636-524-8503
Email: mike.howard@oa.mo.gov

Project Manager: Fred L. Decker Jr
Division of Facilities Management, Design and Construction
301 West High Street, Room 730
Jefferson City, Missouri 65101
Telephone: 573-751-8521
Email: Fred.Decker@oa.mo.gov

Contract Specialist: Mandy Roberson
Division of Facilities Management, Design and Construction
301 West High Street, Room 730
Jefferson City, Missouri 65101
Telephone: 573-522-0074
Email: mandy.roberson@oa.mo.gov

3.0 NOTICE: ALL BID MATERIALS ARE DUE AT THE TIME OF BID SUBMITTAL. THERE IS NO SECOND SUBMITTAL FOR THIS PROJECT.

4.0 FURNISHING CONSTRUCTION DOCUMENTS:

- A. The Owner will furnish the Contractor with approximately 3 complete sets of drawings and specifications at no charge.
- B. The Owner will furnish the Contractor with approximately 3 sets of explanatory or change drawings at no charge.
- C. The Contractor may make copies of the documents as needed with no additional cost to the Owner.

5.0 SAFETY REQUIREMENTS

Contractor and subcontractors at any tier shall comply with RSMo 292.675 and Article 1.3, E, of Section 007213, General Conditions.

6.0 OFF-SITE BORROW & SPOIL DEPOSIT SITES FOR FEDERALLY FUNDED PROJECTS:

All Federally funded projects which involve off-site borrow and/or off-site spoil deposit sites will require written certification that the site(s) are in compliance with the National Environmental Protection Act and all related applicable Federal and State laws and regulations. If the need for off-site borrow and/or spoil sites is stipulated in the Contract Documents, the following applies:

- A. The Contractor is required to use only the designated site described in the Contract Documents. If another off-site area is proposed by the Contractor, the Contractor must provide written certification to the Division of Facilities Management, Design and Construction Project Representative that the proposed borrow or spoil site has been cleared of environmental concerns in accordance with all applicable Federal and State laws and regulations. These include but are not limited to the following: Clean Water Act; the Endangered Species Act; the National Historic Preservation Act (NHPA) (The site must have Section 106 Clearance); the Farmland Protection Act; Resource Conservation and Recovery Act; Comprehensive Environmental Response; Compensation and Liability Act; and RSMo Chapter 194, Section 194.400, Unmarked Human Burial Sites. Certifications shall include clearance letters and other evidence of coordination with the appropriate regulatory agencies. The Missouri Historic Preservation Office, PO Box 176 Jefferson City, MO 65102, may be contacted to provide assistance with the NHPA and cultural resource issues pertaining to the borrow and spoil site regulations. The Missouri State Historic Preservation Office can provide a list of qualified and certified archaeologists to assist in borrow and spoil site investigations.
- B. If project conditions require off-site borrow or off-site deposit of spoils, the Contractor will be required to provide written certification to the Division of Facilities Management, Design and Construction Project Representative that the proposed borrow or spoil site has been cleared of environmental concerns in accordance with all applicable Federal and State laws and regulations. These include but are not limited to the following: Clean Water Act; the Endangered Species Act; the National Historic Preservation Act (NHPA) (The site must have Section 106 Clearance); the Farmland Protection Act; Resource Conservation and Recovery Act; Comprehensive Environmental Response; Compensation and Liability Act; and RSMo Chapter 194, Section 194.400, Unmarked Human Burial Sites. Certifications shall include clearance letters and other evidence of coordination with the appropriate regulatory agencies. The Missouri Historic Preservation Office, PO Box 176 Jefferson City, MO 65102, may be contacted to provide assistance with the NHPA and cultural resource issues pertaining to the borrow and spoil site regulations. The Missouri State Historic Preservation Office can provide a list of qualified and certified archaeologists to assist in borrow and spoil site investigations.
- C. The Owner recognizes that additional time (beyond what is allowed in the Construction Contract) may be required in order to secure the aforementioned certifications and approvals. Should more time be required, the Owner will consider approval of a no-cost time extension contract change. The Contractor will be required to provide documentation that substantiates the need for the time extension.

**SECTION 007333 - SUPPLEMENTARY GENERAL CONDITIONS
FOR FEDERALLY FUNDED/ASSISTED CONSTRUCTION PROJECTS**

1.0 Notice of Federal Funding

This project is being performed in whole or in part using federal funds. Therefore, all work or services performed by the Contractor and its subcontractors shall be subject to the terms and conditions set forth below in addition to all terms and conditions in the Construction Contract, General Conditions, and other contract documents. The concepts, rules, and guidelines set forth in 2 C.F.R. 200 describing allowable costs and administrative requirements apply.

2.0 Definitions

As used herein, “Federal Government” means the government of the United States of America. “Federal Agency” means an agency, entity, department or division of the Federal Government that is providing funding for this project. All other terms shall have the meanings established in the Construction Contract, General Conditions, and/or Project Manual, unless such definitions conflict with a definition provided in an applicable statute or regulation.

3.0 Conflicting Terms or Conditions

To the extent that any terms or conditions set forth herein conflict with the Construction Contract or its General Conditions, the more stringent of the two terms and conditions shall govern.

4.0 No Obligation by Federal Government

The Federal Government is not a party to this contract and is not subject to any obligations or liabilities to the non-Federal entity, Contractor, or any other party pertaining to any matter resulting from the contract.

5.0 Compliance with Federal Laws, Regulations and Executive Orders

The Contractor and its subcontractors and suppliers are required to comply with all applicable Federal laws, regulations, and executive orders, regardless of whether set forth herein. The Contractor shall assist and enable the State of Missouri in complying with any requirements imposed by the Federal Agency as a condition of funding.

6.0 Compliance with Civil Rights Provisions

The Contractor shall comply with all Federal statutes, executive orders, and regulations relating to nondiscrimination. These include, but are not limited to the following:

Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin;

Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex;

Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps;

The Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age;

Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing;

Title VII of the Civil Rights Act of 1964 (42 U.S.C. part 2000(e), which prohibits discrimination against employees on the basis of religion;

Any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and

The requirements of any other nondiscrimination statute(s) that may apply to the application.

7.0 Equal Employment Opportunity (41 C.F.R. 60-1.4(b)).

During the performance of this contract, the Contractor agrees as follows:

- (1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

- (2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
- (3) The Contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicants or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the Contractor's legal duty to furnish information.
- (4) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor

union or workers' representatives of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (4) in every subcontract or purchase order. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: *Provided*, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: *Provided*, That if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract. The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and sub-contractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

8.0 Prohibition of Segregated Facilities

- (1) The Contractor agrees that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this clause is a violation of the Equal Employment Opportunity clause in this contract.
- (2) "Segregated facilities," as used in this clause, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.
- (3) The Contractor shall include this clause in every subcontract and purchase order that is subject to the Equal Employment Opportunity clause of this contract.

9.0 Davis-Bacon Act (40 U.S.C. §§ 3141-3144, and §§ 3146-3148, and 29 C.F.R. pt. 5) *(the requirements of the Davis-Bacon Act are not applicable to this Project)*

~~(1) Minimum wages:~~

- ~~(i) All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations~~

~~issued by the Secretary of Labor under the Copeland Act (29 C.F.R. pt. 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in § 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided*, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.~~

- ~~(ii)(A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination, and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:~~
- ~~(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and~~
 - ~~(2) The classification is utilized in the area by the construction industry; and~~
 - ~~(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.~~
- ~~(B) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.~~
- ~~(C) In the event the Contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized~~

~~representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.~~

~~(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii)(B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.~~

~~(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.~~

~~(iv) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, *Provided*, That the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.~~

~~(2) Withholding. The (write in name of Federal Agency or the loan or grant recipient) shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the Contractor under this contract or any other Federal contract with the same prime Contractor, or any other federally assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime Contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, the (Agency) may, after written notice to the Contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.~~

~~(3) Payrolls and basic records:~~

~~(i) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 C.F.R. 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors~~

~~employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.~~

- ~~(ii)(A) The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the (write in name of appropriate federal agency) if the agency is a party to the contract, but if the agency is not such a party, the Contractor will submit the payrolls to the applicant, sponsor, or owner, as the case may be, for transmission to the (write in name of agency). The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 C.F.R. 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead, the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH 347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime Contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the (write in name of appropriate federal agency) if the agency is a party to the contract, but if the agency is not such a party, the Contractor will submit them to the applicant, sponsor, or owner, as the case may be, for transmission to the (write in name of agency), the Contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime Contractor to require a subcontractor to provide addresses and social security numbers to the prime Contractor for its own records, without weekly submission to the sponsoring government agency (or the applicant, sponsor, or owner).~~
- ~~(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:~~
- ~~(1) That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 C.F.R. pt. 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 C.F.R. pt. 5, and that such information is correct and complete;~~
 - ~~(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 C.F.R. pt. 3;~~
 - ~~(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.~~
- ~~(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH 347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.~~

~~(D) The falsification of any of the above certifications may subject the Contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.~~

~~(iii) The Contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the (write the name of the agency) or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit the required records or to make them available, the Federal Agency may, after written notice to the Contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 C.F.R. 5.12.~~

~~(4) Apprentices and trainees —~~

~~(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a Contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.~~

~~(ii) Trainees. Except as provided in 29 C.F.R. 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the~~

~~U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.~~

- ~~(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of 29 C.F.R. pt. 30.~~
- ~~(5) Compliance with Copeland Act requirements. The Contractor shall comply with the requirements of 29 C.F.R. pt. 3, which are incorporated by reference in this contract.~~
- ~~(6) Subcontracts. The Contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 C.F.R. 5.5(a)(1) through (10) and such other clauses as the (write in the name of the Federal Agency) may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime Contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 C.F.R. 5.5.~~
- ~~(7) Contract termination: debarment. A breach of the contract clauses in 29 C.F.R. 5.5 may be grounds for termination of the contract, and for debarment as a Contractor and a subcontractor as provided in 29 C.F.R. 5.12.~~
- ~~(8) Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 C.F.R. pts. 1, 3, and 5 are herein incorporated by reference in this contract.~~
- ~~(9) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 C.F.R. pts. 5, 6, and 7. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.~~
- ~~(10) Certification of eligibility.~~

- ~~(i) By entering into this contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis Bacon Act or 29 C.F.R. 5.12(a)(1).~~
- ~~(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis Bacon Act or 29 C.F.R. 5.12(a)(1).~~
- ~~(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. § 1001.~~

10.0 Copeland “Anti-Kickback” Act

- (1) The Contractor shall comply with 18 U.S.C. § 874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. pt. 3 as may be applicable, which are incorporated by reference into this contract. The Contractor and subcontractors are prohibited from inducing, by any means, any person employed on the project to give up any part of the compensation to which the employee is entitled.
- (2) The Contractor or subcontractor shall insert in any subcontracts the clause above, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime Contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all of these contract clauses.
- (3) A breach of the contract clauses above may be grounds for termination of the contract, and for debarment as a Contractor and subcontractor as provided in 29 C.F.R. 5.12.

11.0 Contract Work Hours and Safety Standards Act (40 U.S.C. 3701 to 3708, 29 C.F.R. 5.5)

- (1) Overtime requirements. No Contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
- (2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1) of this section the Contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this section, in the sum of \$27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.
- (3) Withholding for unpaid wages and liquidated damages. The Owner shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or subcontractor under any such contract or any other Federal contract with the same prime Contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held

by the same prime Contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.

- (4) Subcontracts. The Contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime Contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this section.

12.0 Suspension and Debarment (Executive Orders 12549 and 12689, 2 C.F.R. pt. 180)

- (1) A contract award (see 2 C.F.R. 180.220) must not be made to parties listed on the government-wide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 C.F.R. 180 that implement Executive Orders 12549 (3 C.F.R. pt. 1986 Comp., p. 189) and 12689 (3 C.F.R. pt. 1989 Comp., p. 235), “Debarment and Suspension.” SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared ineligible under statutory or regulatory authority other than Executive Order 12549.
- (2) The contractor is required to verify that none of the contractor’s principals (defined at 2 C.F.R. 180.995) or its affiliates (defined at 2 C.F.R. 180.905) are excluded (defined at 2 C.F.R. 180.940) or disqualified (defined at 2 C.F.R. 180.935).
- (3) The contractor must comply with 2 C.F.R. pt. 180, subpart C and the regulations of the granting Federal Agency regarding suspension and debarment and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.
- (4) This certification is a material representation of fact relied upon by the Owner. If it is later determined that the Contractor did not comply with 2 C.F.R. pt. 180, subpart C in addition to remedies available to the Owner, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.
- (5) By submitting a bid, the bidder or proposer agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

13.0 Byrd Anti-Lobbying Amendment (31 U.S.C. § 1352)

- (1) Contractors that apply or bid for an award exceeding \$100,000 agree to file the required certification (set forth below), in compliance with 31 U.S.C. § 1352 (as amended).
- (2) Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352.

- (3) Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency.

CERTIFICATION REGARDING LOBBYING

The Bidder or Offeror certifies by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

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

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

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

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

14.0 Procurement of Recovered Materials

The Contractor shall comply with section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (42 U.S.C. § 6962). The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds \$10,000 or the value of the quantity acquired during the preceding fiscal year exceeded \$10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

Information about this requirement, along with the list of EPA designated items, is available at EPA’s Comprehensive Procurement Guidelines web site, <https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program>.

15.0 Fair Labor Standards Act

All contracts and subcontracts that result from this solicitation incorporate by reference the provisions of 29 C.F.R. pt. 201, the Federal Fair Labor Standards Act (FLSA), with the same force and effect as if given in full text. The FLSA sets minimum wage, overtime pay, recordkeeping, and child labor standards for full and part-time workers. The Contractor has full responsibility to monitor compliance to the referenced statute or regulation. The Contractor must address any claims or disputes that arise from this requirement directly with the U.S. Department of Labor – Wage and Hour Division.

16.0 Access to Records and Reports

The Contractor must maintain an acceptable cost accounting system. The Contractor agrees to provide the Owner, the Federal Agency and the Comptroller General of the United States or any of their duly authorized representatives access to any books, documents, papers and records of the Contractor which are directly pertinent to the specific contract for the purpose of making audit, examination, excerpts and transcriptions. The Contractor agrees to maintain all books, records and reports required under this contract for a period of not less than three years after final payment is made and all pending matters are closed.

17.0 Occupational Health and Safety Act

All contracts and subcontracts that result from this solicitation incorporate by reference the requirements of 29 C.F.R. pt. 1910 with the same force and effect as if given in full text. The employer must provide a work environment that is free from recognized hazards that may cause death or serious physical harm to the employee. The employer retains full responsibility to monitor its compliance and their subcontractor's compliance with the applicable requirements of the Occupational Safety and Health Act of 1970 (29 C.F.R. pt. 1910). The employer must address any claims or disputes that pertain to a referenced requirement directly with the U.S. Department of Labor – Occupational Safety and Health Administration.

18.0 Rights to Inventions

Contracts or agreements that include the performance of experimental, developmental, or research work must provide for the rights of the Federal Government and the Owner in any resulting invention as established by 37 C.F.R. pt. 401, Rights to Inventions Made by Non-profit Organizations and Small Business Firms under Government Grants, Contracts, and Cooperative Agreements. This contract incorporates by reference the patent and inventions rights as specified within 37 C.F.R. 401.14. Contractor must include this requirement in all sub-tier contracts involving experimental, developmental, or research work.

19.0 Energy Conservation

The Contractor agrees to comply with mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 U.S.C. § 6201 et seq.).

20.0 Clean Air Act and Federal Water Pollution Control Act

- (1) If the amount of the Contract exceeds \$150,000, the Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq. and the Federal Water Pollution Control Act, as amended, 33 U.S.C. § 1251 et seq.

- (2) The Contractor agrees to report each violation to the Owner, and understands and agrees that the Owner will, in turn, report each violation as required to assure notification to the Federal Agency and the appropriate Environmental Protection Agency Regional Office.
- (3) The Contractor agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with Federal assistance.

21.0 Contractor Employee Whistleblower Rights and Requirement to Inform Employees of Whistleblower Rights

- (1) This contract and employees working on this contract will be subject to the whistleblower rights and remedies in the pilot program on contractor employee whistleblower protections established at 41 U.S.C. § 4712 by section 828 of the National Defense Authorization Act for Fiscal Year 2013 (Pub. L. 112-239) and FAR 3.908.
- (2) The Contractor shall inform its employees in writing, in the predominant language of the workforce, of employee whistleblower rights and protections under 41 U.S.C. § 4712, as described in section 3.908 of the Federal Acquisition Regulation.
- (3) The Contractor shall insert the substance of this clause, including this paragraph (c), in all subcontracts over the simplified acquisition threshold.

22.0 Veteran's Preference

In the employment of labor (excluding executive, administrative, and supervisory positions), the Contractor and all sub-tier contractors must give preference to covered veterans as defined within Title 49 United States Code Section 47112. Covered veterans include Vietnam-era veterans, Persian Gulf veterans, Afghanistan-Iraq war veterans, disabled veterans, and small business concerns (as defined by 15 U.S.C. § 632) owned and controlled by disabled veterans. This preference only applies when there are covered veterans readily available and qualified to perform the work to which the employment relates.

23.0 Drug Free Workplace Act

The Contractor shall provide a drug free workplace in accordance with the Drug Free Workplace Act of 1988, 41 U.S.C. Chapter 81, and all applicable regulations. The Contractor shall report any conviction of the Contractor's personnel under a criminal drug statute for violations occurring on the Contractor's premises or off the Contractor's premises while conducting official business. A report of a conviction shall be made to the state agency within five (5) working days after the conviction.

24.0 Access Requirements for Persons with Disabilities

Contractor shall comply with 49 U.S.C. § 5301(d), stating Federal policy that the elderly and persons with disabilities have the same rights as other persons to use mass transportation services and facilities and that special efforts shall be made in planning and designing those services and facilities to implement that policy. Contractor shall also comply with all applicable requirements of Sec. 504 of the Rehabilitation Act (1973), as amended, 29 U.S.C. § 794, which prohibits discrimination on the basis of handicaps, and the Americans with Disabilities Act of 1990 (ADA), as amended, 42 U.S.C. § 12101 et seq., which requires that accessible

facilities and services be made available to persons with disabilities, including any subsequent amendments thereto.

25.0 Seismic Safety

The Contractor agrees to ensure that all work performed under this contract, including work performed by subcontractors, conforms to a building code standard that provides a level of seismic safety substantially equivalent to standards established by the National Earthquake Hazards Reduction Guidelines for Contract Provisions for Obligated Sponsors and Airport Improvement Program Projects Issued on June 19, 2018 Page 61 Program (NEHRP). Local building codes that model their code after the current version of the International Building Code (IBC) meet the NEHRP equivalency level for seismic safety.

26.0 Required Use of American Iron, Steel, Manufactured Products, and Construction Materials – Build America, Buy America (Pub. L. No. 117-58, §§ 70901-52)

The Owner is the recipient of an award of Federal financial assistance from a program for infrastructure for this project. Pursuant to the Build America, Buy America Act of the Infrastructure Investment and Jobs Act (“IIJA”), Pub. L. No. 117-58, none of the funds provided under the Federal award may be used unless the requirements of the domestic content procurement preference outlined below are met. Therefore, the Contractor shall ensure the following:

- (1) all iron and steel used in the project are produced in the United States--this means all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States;
- (2) all manufactured products used in the project are produced in the United States—this means the manufactured product was manufactured in the United States; and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 65 percent of the total cost of all components of the manufactured product, unless another standard for determining the minimum amount of domestic content of the manufactured product has been established under applicable law or regulation; and
- (3) all construction materials are manufactured in the United States—this means that all manufacturing processes for the construction material occurred in the United States.

The Buy America preference only applies to articles, materials, and supplies that are consumed in, incorporated into, or affixed to an infrastructure project. As such, it does not apply to tools, equipment, and supplies, such as temporary scaffolding, brought to the construction site and removed at or before the completion of the infrastructure project. Nor does a Buy America preference apply to equipment and furnishings, such as movable chairs, desks, and portable computer equipment, that are used at or within the finished infrastructure project, but are not an integral part of the structure or permanently affixed to the infrastructure project.

Waivers

When necessary, recipients of Federal financial assistance may apply for, and the awarding agency may grant, a waiver from the domestic content procurement preference.

When the Federal agency has made a determination that one of the following exceptions applies, the awarding official may waive the application of the domestic content procurement preference in any case in which the agency determines that:

- (1) applying the domestic content procurement preference would be inconsistent with the public interest;
- (2) the types of iron, steel, manufactured products, or construction materials are not produced in the United States in sufficient and reasonably available quantities or of a satisfactory quality; or
- (3) the inclusion of iron, steel, manufactured products, or construction materials produced in the United States will increase the cost of the overall project by more than 25 percent. A request to waive the application of the domestic content procurement preference must be in writing. The agency will provide instructions on the format, contents, and supporting materials required for any waiver request. Waiver requests are subject to public comment periods of no less than 15 days and must be reviewed by the Made in America Office.

There may be instances where an award qualifies, in whole or in part, for an existing waiver described on the awarding agency web site.

If the Contractor determines that an application for a waiver is necessary or an existing waiver is applicable to this project, the Contractor shall timely notify the Owner. The Owner will make a determination if a waiver is applicable or if a waiver application is necessary. The Contractor shall not submit any waiver application or information directly to the Federal agency without prior approval by the Owner.

Definitions

“Construction materials” includes an article, material, or supply—other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives—that is or consists primarily of: • non-ferrous metals; • plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables); • glass (including optic glass); • lumber; or • drywall.

“Domestic content procurement preference” means all iron and steel used in the project are produced in the United States; the manufactured products used in the project are produced in the United States; or the construction materials used in the project are produced in the United States.

“Infrastructure” includes, at a minimum, the structures, facilities, and equipment for, in the United States, roads, highways, and bridges; public transportation; dams, ports, harbors, and other maritime facilities; intercity passenger and freight railroads; freight and intermodal facilities; airports; water systems, including drinking water and wastewater systems; electrical transmission facilities and systems; utilities; broadband infrastructure; and buildings and real property. Infrastructure includes facilities that generate, transport, and distribute energy.

“Project” means the construction, alteration, maintenance, or repair of infrastructure in the United States.

27.0 Prohibition on Certain Telecommunication and Video Surveillances Services or Equipment
(Pub. L. 115-232, Section 889)

Section 889(b) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019, Pub. L. No. 115-232, and 2 C.F.R. § 200.216 prohibit the head of a Federal executive agency and recipients or subrecipients of funds from such agencies from obligating or expending grant, cooperative agreement, loan, or loan guarantee funds on certain telecommunications products or from certain entities for national security reasons. Pursuant to such provisions, the Contractor understands and agrees that the Contractor and its subcontractors shall not obligate or expend loan or grant funds from the Federal Agency under this Contract to:

(1) Procure or obtain;

(2) Extend or renew a contract to procure or obtain; or

(3) Enter into a contract (or extend or renew a contract) to procure or obtain equipment, services, or systems that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in [Public Law 115–232](#), section 889, covered telecommunications equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).

(i) For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).

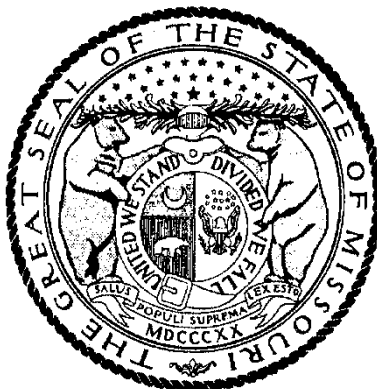
(ii) Telecommunications or video surveillance services provided by such entities or using such equipment.

(iii) Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

Missouri

Division of Labor Standards

WAGE AND HOUR SECTION



MIKE KEHOE, Governor

Annual Wage Order No. 32

Section 100
ST. LOUIS COUNTY

In accordance with Section 290.262 RSMo 2000, within thirty (30) days after a certified copy of this Annual Wage Order has been filed with the Secretary of State as indicated below, any person who may be affected by this Annual Wage Order may object by filing an objection in triplicate with the Labor and Industrial Relations Commission, P.O. Box 599, Jefferson City, MO 65102-0599. Such objections must set forth in writing the specific grounds of objection. Each objection shall certify that a copy has been furnished to the Division of Labor Standards, P.O. Box 449, Jefferson City, MO 65102-0449 pursuant to 8 CSR 20-5.010(1). A certified copy of the Annual Wage Order has been filed with the Secretary of State of Missouri.

Original Signed by

Logan Hobbs, Director
Division of Labor Standards

Filed With Secretary of State: March 10, 2025

Last Date Objections May Be Filed: April 9, 2025

Prepared by Missouri Department of Labor and Industrial Relations

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Asbestos Worker	\$69.96
Boilermaker	\$43.65*
Bricklayer-Stone Mason	\$65.72
Carpenter	\$66.94
Lather	
Linoleum Layer	
Millwright	
Pile Driver	
Cement Mason	\$59.71
Plasterer	
Communication Technician	\$65.78
Electrician (Inside Wireman)	\$77.36
Electrician Outside Lineman	\$76.24
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Elevator Constructor	\$43.65*
Glazier	\$69.12
Ironworker	\$72.66
Laborer	\$56.81
General Laborer	
First Semi-Skilled	
Second Semi-Skilled	
Mason	\$59.98
Marble Mason	
Marble Finisher	
Terrazzo Worker	
Terrazzo Finisher	
Tile Setter	
Tile Finisher	
Operating Engineer	\$74.42
Group I	
Group II	
Group III	
Group III-A	
Group IV	
Group V	
Painter	\$55.58
Plumber	\$80.47
Pipe Fitter	
Roofer	\$59.92
Sheet Metal Worker	\$76.34
Sprinkler Fitter	\$82.64
Truck Driver	\$43.65*
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

*The Division of Labor Standards received fewer than 1,000 reportable hours for this occupational title. The public works contracting minimum wage is established for this occupational title using data provided by Missouri Economic Research and Information Center.

**The Prevailing Hourly Rate includes any applicable fringe benefit amounts for each occupational title as defined in RSMo Section 290.210.

Heavy Construction Rates for
ST. LOUIS County

Section 100

OCCUPATIONAL TITLE	**Prevailing Hourly Rate
Carpenter	\$60.20
Millwright	
Pile Driver	
Electrician (Outside Lineman)	\$76.24
Lineman Operator	
Lineman - Tree Trimmer	
Groundman	
Groundman - Tree Trimmer	
Laborer	\$56.76
General Laborer	
Skilled Laborer	
Operating Engineer	\$73.58
Group I	
Group II	
Group III	
Group IV	
Truck Driver	\$45.56
Truck Control Service Driver	
Group I	
Group II	
Group III	
Group IV	

Use Heavy Construction Rates on Highway and Heavy construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(3).

Use Building Construction Rates on Building construction in accordance with the classifications of construction work established in 8 CSR 30-3.040(2).

If a worker is performing work on a heavy construction project within an occupational title that is not listed on the Heavy Construction Rate Sheet, use the rate for that occupational title as shown on the Building Construction Rate Sheet.

*The Division of Labor Standards received fewer than 1,000 reportable hours for this occupational title. Public works contracting minimum wage is established for this occupational title using data provided by Missouri Economic Research and Information Center.

**The Prevailing Hourly Rate includes any applicable fringe benefit amounts for each occupational title.

OVERTIME and HOLIDAYS

OVERTIME

For all work performed on a Sunday or a holiday, not less than twice (2x) the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work.

For all overtime work performed, not less than one and one-half (1½) the prevailing hourly rate of wages for work of a similar character in the locality in which the work is performed or the public works contracting minimum wage, whichever is applicable, shall be paid to all workers employed by or on behalf of any public body engaged in the construction of public works, exclusive of maintenance work or contractual obligation. For purposes of this subdivision, "**overtime work**" shall include work that exceeds ten hours in one day and work in excess of forty hours in one calendar week; and

A thirty-minute lunch period on each calendar day shall be allowed for each worker on a public works project, provided that such time shall not be considered as time worked.

HOLIDAYS

January first;
The last Monday in May;
July fourth;
The first Monday in September;
November eleventh;
The fourth Thursday in November; and
December twenty-fifth;

If any holiday falls on a Sunday, the following Monday shall be considered a holiday.

SECTION 011000 - SUMMARY OF WORK

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 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Project consists of the renovation of a wing in an existing veterans home.
 - 1. Project Location: Missouri Veterans Home, St. Louis.
 - 2. Owner: State of Missouri, Office of Administration, Division of Facilities Management, Design and Construction, Harry S Truman State Office Building, Post Office Box 809, 301 West High Street, Jefferson City, Missouri 65102.
- B. Contract Documents, dated June 26, 2025 were prepared for the Project by CannonDesign.
- C. The Work consists of interior renovation of the existing facility.
- D. The Work will be constructed under a single prime contract.

1.4 WORK SEQUENCE

- A. The renovation work of A Wing will be conducted in a single phase. Duration for entire project in working days is listed on the Bid Form. The schedule will need to include a beginning and completion date, when inspections and submittals will occur, anticipated punch list dates and other activities as required by Section 013200 – Schedule – Bar Chart.
- B. Corridor work within the central facility to occur after hours, most rooms must remain open to staff and residents during the day. All emergency means of egress to remain open at all times.
- C. 10 working days are to be attributed to facility interruption days. These are days when the Contractor will not be able to work on site due to facility use or spot inspections. Owner will give 48 hours notice when possible of facility interruption days. Spot inspections can occur at any time and no notice will be given.

- D. Contractor's proposed schedule is to comply with requirements above and will be expected to employ a workforce of sufficient size and have materials ready in a timely manner to ensure schedule is maintained.
- E. Contractor to submit schedule for approval in accordance with Division 01 Section "Schedules".
- F. Contractor must protect public from any overhead work. Safety plan for renovating occupied space must be submitted to the Owner for approval before any work begins. Refer to Section 013513 – Site Security and Health Requirements and Section 015000 – Construction Facilities and Temporary Controls.

1.5 CONTRACTOR USE OF PREMISES

- A. Use of the Site: Limit use of the premises to work in areas indicated. Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.
 - 1. Owner Occupancy: Allow for Owner occupancy and use by the public.
 - 2. Driveways and Entrances: Keep driveways and entrances serving the premises clear and available to the Owner, the Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- B. Use of the Existing Building: Maintain the existing building in a weathertight condition throughout the construction period. Repair damage cause by construction operations. Take all precautions necessary to protect the building and its occupants during the construction period.

1.6 OCCUPANCY REQUIREMENTS

- A. Full Owner Occupancy: The Owner will occupy the site and existing building during the entire construction period. Cooperate with the Owner during construction operations to minimize conflicts and facilitate owner usage. Perform the Work so as not to interfere with the Owner's operations.
- B. Partial Owner Occupancy: The Owner reserves the right to occupy and to place and install equipment in completed areas of the building prior to Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placing of equipment and partial occupancy shall not constitute acceptance of the total Work.
 - 1. The Designer will prepare a Certificate of Partial Occupancy for each specific portion of the Work to be occupied prior to substantial completion.
 - 2. Prior to partial Owner occupancy, mechanical and electrical systems shall be fully operational. Required inspections and tests shall have been successfully completed. Upon occupancy, the Owner will operate and maintain mechanical and electrical systems serving occupied portions for the building.
 - 3. Upon occupancy, the Owner will assume responsibility for maintenance and custodial service for occupied portions for the building.

1.7 OWNER-FURNISHED PRODUCTS

- A. The Owner will furnish items indicated. The Work includes providing support systems to receive Owner's equipment, and mechanical and electrical connections.
1. The Owner will arrange for and deliver necessary shop drawings, product data, and samples to the Contractor.
 2. The Owner will arrange and pay for delivery of Owner-furnished items according to the contractor's Construction Schedule.
 3. The Contractor is responsible for receiving, unloading and handling Owner furnished items at the site.
 4. Following delivery, the Contractor will inspect items delivered for damage. The Contractor shall not accept damaged items and shall notify the Owner of rejection of damaged items.
 5. If Owner-furnished items are damaged, defective, or missing, the Owner will arrange for replacement.
 6. The Owner will arrange for manufacturer's field services and for the delivery of manufacturer's warranties to the appropriate Contractor.
 7. The Contractor shall designate delivery dates of Owner-furnished items in the Contractor's Construction Schedule.
 8. The Contractor shall review shop drawings, product data and samples and return them to the Designer noting discrepancies or problems anticipated in use of the project.
 9. The Contractor is responsible for protecting Owner-furnished items from damage, including damage from exposure to the elements. The Contractor shall repair or replace items damaged as a result of his operations.
- B. A responsibility matrix of items is attached following this section for use in identifying Furnishings, Fixtures and Equipment.

1.8 MISCELLANEOUS PROVISIONS

- A. The State of Missouri has an existing contract with Walter Louis Fluid Technologies for water treatment services. The State of Missouri will utilize this existing contract to provide all chemicals needed for startup as well as all future chemicals needed to protect and maintain the equipment. The Contractor shall coordinate with Walter Louis Fluid Technologies to ensure the existing water treatment system is compatible with new equipment.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 011000

FFE Responsibility Matrix

FFE Responsibility Matrix

	PLANNED BY			PROCURED BY				INSTALLED BY			COMMENTS	
	CanonDesign	Owner	Vendor	Contractor	Owner	Existing	Vendor	Other	Contractor	Owner	Vendor	
This list may not be inclusive of all items described as required in the Project Manual. It is the responsibility of the Contractor to ensure that all items to be procured and installed, or removed, protected, and reinstalled are done so according to the schedule approved by the Owner.												
Accessories												
Temporary/Mobile Privacy Screen		X			X					X		
Cubicle Curtains		X			X					X		
Cubicle Curtain Track	X			X					X			
Coat Hook	X			X					X			Resident rooms & offices
Corner Guards/ Bumper Rails/Handrails	X			X					X			Coordinate finish/specs w/ Interior Designer
Grab Bars	X			X					X			
Hand Rails and Hand Rail Recovering	X			X					X			Coordinate finish/specs w/ Interior Designer
Hand Sanitizer Dispenser, Wall-mounted		X			X					X		
Kick Plates	X			X					X			
Medicine Cabinet in Resident Room	X			X					X			
Mirrors/With and Without a Shelf	X			X					X			Coordinate finish/specs w/ Interior Designer
Paper Towel Dispenser - Automatic	X				X				X			Coordinate finish/specs w/ Interior Designer
Paper Towel Dispenser - Standard	X			X					X			Coordinate finish/specs w/ Interior Designer
Shelf - resident Toilet Room	X			X					X			
Soap Dispenser/ Hand Gel	X				X				X			Coordinate finish/specs w/ Interior Designer
Toilet Paper Dispenser	X				X				X			
Wall Protection	X			X					X			Coordinate finish/specs w/ Interior Designer
AV / Security / Communications												
Audio Visual System		X			X					X		
Audio Visual - Rough-In	X			X					X			
Audio Visual Carts		X			X					X		
Closed Circuit Video Surveillance			X		X		X				X	Existing and New Equipment
Closed Circuit Video Surveillance - Rough In			X	X					X			
Computer - Stands, Carts		X			X					X		
Computer Articulating Arm	X	X			X				X			
Computer Wall Mount - Rough-In including in wall backing	X					X			X			Remove, protect, and reinstall existing at nursing touchdown stations
Computers		X			X					X		
Electronic Charting - Software		X			X					X		
Fire Alarm	X			X					X			
Grounding and Bonding	X			X					X			
Low Voltage Light Relays	X			X					X			
Network Electronics		X	X		X		X				X	
Nurse Call System	X					X	X		X			Remove, protect, and reinstall existing new locations
Nurse Call System - Rough In	X			X					X			
Printer - Stand Alone		X			X					X		
Printer/Copier/Fax/Scanner		X			X					X		
RFID (resident) Tracking System						X						
Structured Cabling (i.e. cabling, patch panels)	X			X					X			
Structured Cabling - Rough-In	X			X					X			
Structured Cabling - Patch Cords		X			X					X		
Telephone System/Hardware		X			X					X		
TV Antenna/Cable	X			X					X			
TV Mounting Blocking	X			X					X			
TV Mounting Bracket		X			X					X		
TVs		X			X					X		
Wireless Equipment		X			X		X			X	X	
Electrical												
Conduits, Cable Trays	X			X					X			
Equipment (Medical Equipment)												
Aspirators					X					X		
Beds - resident					X							
Biohazard Waste Receptacle					X					X		
Carts - Resident Temporary Storage					X					X		
Carts - Clinical Supply					X					X		
Carts - Crash Adult/Pediatric					X					X		
Carts - Housekeeping					X					X		
Carts - Linen					X					X		
Carts - Case		X			X					X		
Carts - Trash		X			X					X		
Defibrillators						X						
Glove Box Dispenser- Wall Mounted	X			X					X			

FFE Responsibility Matrix

FFE Responsibility Matrix	PLANNED BY			PROCURED BY					INSTALLED BY			COMMENTS
	CannonDesign	Owner	Vendor	Contractor	Owner	Existing	Vendor	Other	Contractor	Owner	Vendor	
This list may not be inclusive of all items described as required in the Project Manual. It is the responsibility of the Contractor to ensure that all items to be procured and installed, or removed, protected, and reinstalled are done so according to the schedule approved by the Owner.												
IV Stands/Poles		X			X					X		
Linen Hamper		X			X					X		
Monitors - Power and Rough-In	X			X					X			
Resident Lifts - Moveable	X					X				X		
Scales - Countertop / Freestanding Floor Mounted						X						
Sharps Containers - Wall Mounted		X			X				X			
Stools - Exam										X		
Equipment (Medical Equipment) - Existing - including those existing items listed above												
Existing Medical Equipment Inventory									X	X		Equipment to be re-used
Existing Medical Equipment Inventory		X								X		Equipment to stay or be sold/ abandoned
Existing Medical Equipment Tagging												Equipment to be re-used
Existing Medical Equipment Relocation									X	X		
Fire Prevention Equipment												
Extinguisher Cabinets	X			X		X			X			Some are existing to be relocated, others will be new
Extinguishers	X			X		X			X			
Furnishings												
Artwork					X					X		
Resident Room Bulletin / Magnetic White Boards	X				X				X			
Conference Room - Table/Seating		X			X					X		
Custom Design Casework	X			X					X			
File Cabinets		X			X					X		
Lobby/Waiting Room Furniture		X			X					X		
Modular Furniture - Offices		X			X					X		
Office Furniture		X			X					X		
Resident Room Furniture (excludes beds)		X			X					X		exceptions below
Resident Room Desk	X			X					X			
Resident Room Wardrobe	X			X					X			
Planters - Moveable		X			X					X		
Seating - Chairs/Sofas/guest chairs/task seating		X			X					X		
Window Treatments (Curtains / Valences etc.)		X			X					X		
Miscellaneous Equipment												
Lockers	X			X					X			
Nourishment Equipment												
Coffee Maker		X			X					X		
Coffee Maker Rough-In	X			X					X			
Dishwasher		X			X					X		
Dishwasher Rough-In	X			X					X			
Ice Maker/Dispenser - Countertop		X			X					X		
Ice Maker/Dispenser - Rough-In	X			X					X			
Microwave					X					X		
Refrigerator/Freezer - Non-Clinical		X			X					X		
Refrigerator/Freezer - Rough-Ins	X			X					X			
Shelving												
Fixed Shelving	X			X					X			
Adjustable Shelving	X			X					X			
Mobile Shelving		X			X					X		
Wayfinding												
Signage - Code Required	X			X					X			
Signage - Rooms		X	X	X					X			
Signage - Facility Wayfinding		X	X	X					X		X	

<u>Box #1 Contents:</u>			
<u>Restrooms</u>	Quantities:	Part Numbers:	Descriptions:
1-Pallet	43	397-65	Medicine Cabinet w/Mirror
1-Pallet	52	B-359033	Paper Towel Dispencer
1-Pallet	27	B-5191	Fold-up Shower Seats
1-Pallet	28	B-5191	Fold-up Shower Seats
1-Pallet	40	B-5191	Fold-up Shower Seats
Mixed Pallet	33	6827	Hat & Coat Hook
	42	6827	Hat & Coat Hook
	27	B-6807	Soap Dish
	29	B-6737	24" Towel Bar
	24	BL737	
	40	B-5806/18	18" Straight Grab Bar
	43	B-5806/36	36" Straight Grab Bar
	6	10-0467-2	
Mixed Pallet	52	B-586/16.99	24"x 36" Peened Grab Bar
	54	B-5806/42	42" Straight Grab Bar
Mixed Pallet	8	397-65	Medicine Cabinet w/Mirror
	1	B-359033	Trimline Recessed Paper TD
	1	2409-R2-Sold-RH-LL	Extinguisher Cabinet

<u>Box #2 Contents:</u>			
<u>Electrical</u>	Quantities:	Part Numbers:	Descriptions:
1-Pallet	96	124005-466331	Lyte Profile 6" round
1-Pallet	86	124005-466331	Lyte Profile 6" round
1-Pallet	90	124005-466331	Lyte Profile 6" round
1-Pallet	90	124005-466331	Lyte Profile 6" round
1-Pallet	36	124005-466331	Lyte Profile 6" round
1-Pallet	96	912400546896	
1-Pallet	119	912400546896	
1-Pallet	57	477315	Phillips 14W 10pcs. Per Box

<u>Box #3 Contents:</u>			
<u>Electrical</u>	Quantities:	Part Numbers:	Descriptions:
1-Pallet	96	912400546896	
1-Pallet	96	912400546896	
1-Pallet	52	7408LCGQN047DEW	
1-Pallet	63	EFSBZ	TV Wall Box
Mixed Pallet	5	CP751	Radiant Panels
	25	FL0039D-VT	LED 3000K
	33	NL1	Recessed
	1	FCV-E030674900700	

<u>Box #4 Contents:</u>			
<u>HVAC/Mech.</u>	Quantities:	Part Numbers:	Descriptions:
1-Pallet	6	C08990 PA	Dampers
1-Pallet	7	E030674900100	Fan Coil Unit
1-Pallet	4	E030674900400	Fan Coil Unit
1-Pallet	3	E030674900200	Fan Coil Unit
1-Pallet	1	E030674900900	Fan Coil Unit
1-Pallet	6	120SQN17DVF	
1-Pallet	4	100SQN28DVF33	EF-02 MO VTRNS HOME C311800-4
1-Pallet	9	100SQN28DVF33	EF-01 MO VTRNS HOME C311800-4
Mixed Pallet	9	10"	Flex Duct
	2	8"	Flex Duct
	5	6"	Flex Duct
1-Pallet	27	QRF2448	Mounting Kit/Radiant Ceiling Heat

<u>Warehouse Contents:</u>	<u>100 per box Quantities:</u>	<u>Single pcs. Quantities:</u>	<u>Part Numbers:</u>	<u>Descriptions:</u>
Wall Tile:	8	88	Q090	Pumpkin Spice 3x6x 5/16"
Wall Tile:	8	42	1469	Galaxy
Wall Tile:	8	77	141	Garden Spot
Wall Tile:	8	71	160	Cornsilks
Light:	5 (5 per box)	0	FL0339D-VT	LED 3000K
Heaters:	0	6	CP751	LED 3000K
Ceiling Grid:	0	77		24" Tees
Ceiling Grid:		63		48" Tees
Cabinets	1 (6 per box)	0	12478647-NL1	Recessed
Cabinets	0	9	2409-R2-Sold-RH-LL	Extinguisher -

	<u>18 per box Quantities:</u>	<u>Single pcs. Quantities:</u>	<u>Part Numbers:</u>	<u>Descriptions:</u>
Flooring:	36			Native Pine Bronze
	47	19		Native Pine Bronze
	36	11		Native Pine Bronze
	48			Native Pine Bronze
	48			Native Pine Bronze
	48			Native Pine Bronze
	52	20		Native Pine Bronze
	48			Native Pine Bronze
	36			Native Pine Bronze
	48			Native Pine Bronze
	41			Native Pine Bronze
	48			Native Pine Bronze
	35	18		Native Pine Bronze
	29			Native Pine Bronze
Flooring:	48			Warm Silver
	45	18		Warm Silver
	32			Warm Silver
Flooring:	57	13		Divergent-18x18
Flooring:	92	21		Grove Crumb Cake-18x18

	<u>25 per box Quantities:</u>	<u>Single pcs. Quantities:</u>	<u>Part Numbers:</u>	<u>Descriptions:</u>
Cove Base	26	22		Sandlewood
	14	16		Sandlewood

	<u>2 per box Quantities:</u>	<u>Single pcs. Quantities:</u>	<u>Part Numbers:</u>	<u>Descriptions:</u>
Mechanical:	19	1	D46690-00-01	6" Rnd. Diffuser
	20		D46690-00-01	6" Rnd. Diffuser
	18		D46690-00-01	6" Rnd. Diffuser
Mechanical:	8	1	D46690-00-004	15" Rnd. Diffuser
Mechanical:		1	7063#1CI36	Smoke Damper 12x48

<u>Warehouse</u> Contents:	<u>2 per box</u> Quantities:	<u>Single pcs.</u> Quantities:	<u>Part Numbers:</u>	<u>Descriptions:</u>
1 Mixed Pallet:	28		9510112120W	12" Trim
	30	1		6" Rnd.
Brown		3		Welded Door Frames-36" RH-5"
Gray		1		Welded Door Frames-36" RH-5"
Brown		2		Welded Door Frames-36" LH-5"
Gray		1		Welded Door Frames-36" LH-5"
Radiant Ceiling Heaters:		18	CAA28A01	2 yellow wrapped pallets
Mixed Pallet:		60	56650A	Paper Towel Dispenser
		8	10-0477-SM	Toilet Seat Cover Dispenser
		4	10-0582	Napkin Disposal
		4	2022-H-6122	Sani Lav.

C-Wing: Rm. C210	10 per box	Single pcs.		
<u>Contents:</u>	<u>Quantities:</u>	<u>Quantities:</u>	<u>Part Numbers:</u>	<u>Descriptions:</u>
	17	5	B300-6-IV	
	3		FRM1	
		11	DHF-24120C	Magnetic Dr. Hold Open
		49	P2RL	Wall Horn Strobes
		17	STI-1200	Pull Station Covers
		12	RTS151	Remote Test Stations
		12	DNR	Duct Detector Base
1 Box		36	5RL	Wall Strobes
Packages	7		5RL	Wall Strobes
	1		117412LF	Lead Free Circuit Setter
		172	FSP-951-4-IV	Smoke Detector Head
		6	FSP-951R	Smoke Detector Head
1 Box		20	NBG-12LX	Fire Pull Stations
		9	NBG-12LX	Fire Pull Stations
		8	FCM1	
		8	FCPS-24S6	Power Supply Sub Panel
		8	PC2RL	Ceiling Horn Strobes
		4	FCU-HW-4	Coil Pack
		4	FCU-CC-4	Coil Pack
		1	FCU-CC-3	Coil Pack
		1	FCU-HW-3	Coil Pack
		5	HC-PSTN1-BED/T	Nurse Call Bed Station
	6 (15 per box)	3	HC-PP2-LAV-3K/K	Lav Pull Station
	1	2	HC-CL4-SUPV/T	LED Supervision Module
	3	14	HC-CL4-/T	Dome Lights
	1	1	HC-DUTY-3K/P	Duty Station
		6	HC-PSTN1/T	Patient Stations
		26	HC-PSPKR-D-D2	Pillow Speakers
	6 (4 per box)		EDG1RMRM6 (167GLK)	Exit Signs
		15	HC-PSPKR-DA-D2	Pillow Speakers
	? (10 per box)		HC-PSTN1/T	Patient Stations
		8	HC-PSPKR-D-D2	Pillow Speakers
		1	NGTDSP-H/1B	Table Display
	1 (5 per box)	4	PS-1270F1	Batteries
		99	300KEOZ	Wall Power Cover Assy. Wht.
		100	5002458	A/C Cable w/crimp 7x7 galv. 4' 1.5
1 bag		40	741ZW01	Sync Wall Mount Assy.
open bab		36	741ZW01	Sync Wall Mount Assy.
2 bags		14	741ZW01	Sync Wall Mount Assy.
		102	7408EANNW	Sync-WA-ENCAP Assy.

C-Wing: Rm. C209		Single pcs.		
<u>Contents:</u>		<u>Quantities:</u>	<u>Part Numbers:</u>	<u>Descriptions:</u>
		5	HAB30	30x24 HCAP Base
		1	HAB15R	15x24 HCAP Base
		1	W3030	30x30 Wall 25H
		16	DWR1.5	Dishwasher End Panel
		8	SFR	Sink Frt. Return

<u>A-Wing: Rm. A213</u>	<u>18 per box</u>	<u>Single pcs.</u>		
<u>Contents:</u>	<u>Quantities:</u>	<u>Quantities:</u>	<u>Part Numbers:</u>	<u>Descriptions:</u>
		4	HAB15L	15x24 HCAP Base
		3	HAB15R	15x24 HCAP Base
		11	W3030	30x30 Wall 25H
		11	HAB30	30x24 Base
Mixed Pallet		1	B-5806.99x36	ADA Handrail
		1	B-58616.99	ADA Handrail
Floor Tile	2	6	FRE-P4693	Warm Silver
Rubber Transition Strip		23	172VXP110-230	Brown

SECTION 012200 – UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for Unit Prices.
- B. Related Sections include the following:
 - 1. Division 1 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

1.3 DEFINITIONS

- A. Unit Price is an amount proposed by bidders, stated on the Bid Form Attachment 004322 a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

- A. Unit Prices include all necessary material plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of Unit Prices. Methods of measurement and payment for Unit Prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of Work in-place that involves use of established Unit Prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. List of Unit Prices: A list of Unit Prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each Unit Price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 LIST OF UNIT PRICES

- A. Unit Price No. 1- Mold Remediation:

St. Louis Veteran's Home Renovation
St. Louis, MO
State Project No. U2307-01
CannonDesign Project No. 005680.00

June 26, 2025
Issued for Bid

1. Description: Provide unit cost for mold remediation.
2. Unit of Measurement: Square Foot (SF)
3. Base Bid Quantity: 50 SF

B. Unit Price No. 2- Moisture Vapor Emission Control:

1. Description: Provide cost for moisture vapor emission control according to Section 090561.13 "Moisture Vapor EmissionControl."
2. Unit of Measurement: Square Foot (SF)
3. Base Bid Quantity: 800 SF

END OF SECTION 012200

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements governing Alternates.

1.3 DEFINITIONS

- A. Definition: An alternate is an amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to the Base Bid amount if the Owner decides to accept a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems, or installation methods described in the Contract Documents..
 - 1. The cost for each alternate is the net addition to the Contract Sum to incorporate the Alternate into the Work. No other adjustments are made to the Contract Sum.
- B. No additional time will be allowed for alternate work unless the number of work days is so stated on the bid form.

1.4 PROCEDURES

- A. Coordination: Modify or adjust affected adjacent Work as necessary to completely and fully integrate the Alternate Work into the Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not mentioned as part of the Alternate.
- B. Notification: The award of the Contract will indicate whether alternates have been accepted or rejected.
- C. Execute accepted alternates under the same conditions as other Work of this Contract.
- D. Schedule: A "Schedule of Alternates" is included at the end of this Section. Specification Sections referenced in the Schedule contain requirements for materials necessary to achieve the Work described under each alternate.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. Alternate No. 1: *Provide cost for one additional Nurse Station in lieu of DEN 236 as shown on the Drawings as the referenced add-alternate. Should this alternate be accepted by the Owner after the bids are reviewed, the total nurse station count for A-wing would be 2 (two). If the Owner should decline the alternate, DEN 236 would remain as would the Nurse Station as shown on the Drawings under the base contract.*

END OF SECTION 012300

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract Modifications.
- B. Related Sections include the following:
 - 1. Division 1, Section 013115 "Project Management Communications" for administrative requirements for communications.
 - 2. Division 0, Section 007213, Article 3.1 "Acceptable Substitutions" for administrative procedures for handling Requests for Substitutions made after Contract award.
 - 3. Division 0, Section 007213, Article 4.0 "Changes in the Work" for Change Order requirements.

1.3 REQUESTS FOR INFORMATION

- A. In the event that the Contractor or Subcontractor, at any tier, determines that some portion of the Drawings, Specifications, or other Contract Documents requires clarification or interpretation, the Contractor shall submit a "Request for Information" (RFI) in writing to the Designer. A RFI may only be submitted by the Contractor and shall only be submitted on the RFI forms provided by the Owner. The Contractor shall clearly and concisely set forth the issue for which clarification or interpretation is sought and why a response is needed. In the RFI, the Contractor shall set forth an interpretation or understanding of the requirement along with reasons why such an understanding was reached.
- B. Responses to RFI shall be issued within ten (10) working days of receipt of the Request from the Contractor unless the Designer determines that a longer time is necessary to provide an adequate response. If a longer time is determined necessary by the Designer, the Designer will, within five (5) working days of receipt of the request, notify the Contractor of the anticipated response time. If the Contractor submits a RFI on a time sensitive activity on the current project schedule, the Contractor shall not be entitled to any time extension due to the time it takes the Designer to respond to the request provided that the Designer responds within the ten (10) working days set forth above.
- C. Responses from the Designer will not change any requirement of the Contract Documents. In the event the Contractor believes that a response to a RFI will cause a change to the requirements of the Contract Document, the Contractor shall give written notice to the Designer requesting a Change Order for the work. Failure to give such

written notice within ten (10) working days, shall waive the Contractor's right to seek additional time or cost under Article 4, "Changes in the Work" of the General Conditions.

1.4 MINOR CHANGES IN THE WORK

- A. Designer will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Amount or the Contract Time, on "Designer's Supplemental Instructions" (DSI).

1.5 PROPOSAL REQUESTS

- A. The Designer or Owner Representative will issue a detailed description of proposed Changes in the Work that may require adjustment to the Contract Amount or the Contract Time. The proposed Change Description will be issued using the "Request for Proposal" (RFP) form. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Proposal Requests issued by the Designer or Owner Representative are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
 - 2. Within ten (10) working days after receipt of Proposal Request, submit a proposal for the cost adjustments to the Contract Amount and the Contract Time necessary to execute the Change. The Contractor shall submit his proposal on the appropriate Change Order Detailed Breakdown form. Subcontractors may use the appropriate Change Order Detailed Breakdown form or submit their proposal on their letterhead provided the same level of detail is included. All proposals shall include:
 - a. A detailed breakdown of costs per Article 4.1 of the General Conditions.
 - b. If requesting additional time per Article 4.2 of the General Conditions, include an updated Contractor's Construction Schedule that indicates the effect of the Change including, but not limited to, changes in activity duration, start and finish times, and activity relationship.

1.6 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Proposal Request, the Designer or Owner Representative will issue a Change Order for signatures of Owner and Contractor on the "Change Order" form.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 013100 - COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Projects including, but not limited to, the following:
 - 1. Coordination Drawings.
 - 2. Administrative and supervisory personnel.
 - 3. Project meetings.
- B. Each Contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific Contractor.
- C. Related Sections include the following:
 - 1. Division 1, Section 013200 "Schedules- Bar Chart" for preparing and submitting Contractor's Construction Schedule.
 - 2. Articles 1.8.B and 1.8.C of Section 007213 "General Conditions" for coordinating meetings onsite.
 - 3. Article 5.4.H of Section 007213 "General Conditions" for coordinating Closeout of the Contract.

1.3 COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections, which depend on each other for proper installation, connection, and operation.
- B. Coordination: Each Contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each Contractor shall coordinate its operations with operations included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components with other Contractors to ensure maximum accessibility for required maintenance, service, and repair.

3. Make adequate provisions to accommodate items scheduled for later installation.
 4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components including mechanical and electrical.
- C. Prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
1. Prepare similar memoranda for Owner and separate Contractors if coordination of their Work is required.
- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other Contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's Construction Schedule.
 2. Preparation of the Schedule of Values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Preinstallation conferences.
 7. Startup and adjustment of systems.
 8. Project Closeout activities.
- E. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

1.4 SUBMITTALS

- A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.
- B. Key Personnel Names: Within fifteen (15) work days of starting construction operations, submit a list of key personnel assignments including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.5 PROJECT MEETINGS

- A. The Owner's Construction Representative will schedule a Pre-Construction Meeting prior to beginning of construction. The date, time, and exact place of this meeting will be determined after Contract Award and notification of all interested parties. The Contractor shall arrange to have the Job Superintendent and all prime Subcontractors present at the meeting. During the Pre-Construction Meeting, the construction procedures and information necessary for submitting payment requests will be discussed and materials distributed along with any other pertinent information.
 1. Minutes: Designer will record and distribute meeting minutes.
- B. Progress Meetings: The Owner's Construction Representative will conduct Monthly Progress Meetings as stated in Articles 1.8.B and 1.8.C of Section 007213 "General Conditions".
 1. Minutes: Designer will record and distribute to Contractor the meeting minutes.
- C. Preinstallation Conferences: Contractor shall conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
 1. Attendees: Installer and representatives of Manufacturers and Fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Designer and Construction Representative of scheduled meeting dates.
 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration including requirements for the following:
 - a. Contract Documents
 - b. Options
 - c. Related RFIs
 - d. Related Change Orders
 - e. Purchases
 - f. Deliveries
 - g. Submittals
 - h. Review of mockups
 - i. Possible conflicts
 - j. Compatibility problems
 - k. Time schedules
 - l. Weather limitations

- m. Manufacturer's written recommendations
 - n. Warranty requirements
 - o. Compatibility of materials
 - p. Acceptability of substrates
 - q. Temporary facilities and controls
 - r. Space and access limitations
 - s. Regulations of authorities having jurisdiction
 - t. Testing and inspecting requirements
 - u. Installation procedures
 - v. Coordination with other Work
 - w. Required performance results
 - x. Protection of adjacent Work
 - y. Protection of construction and personnel
- 3. Contractor shall record significant conference discussions, agreements, and disagreements including required corrective measures and actions.
 - 4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
 - 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
 - 6. Revise paragraph below if Project requires holding progress meetings at different intervals. Insert special intervals such as "every third Tuesday" to suit special circumstances.
 - 7. Project name
 - 8. Name and address of Contractor
 - 9. Name and address of Designer
 - 10. RFI number including RFIs that were dropped and not submitted
 - 11. RFI description
 - 12. Date the RFI was submitted
 - 13. Date Designer's response was received
 - 14. Identification of related DSI or Proposal Request, as appropriate

St. Louis Veteran's Home Renovation
St. Louis, MO
State Project No. U2307-01
CannonDesign Project No. 005680.00

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013115 - PROJECT MANAGEMENT COMMUNICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions, Bid Form, and other Division 1 Specification Sections apply to this Section.
- B. Division 1, Section 013300 - Submittals
- C. Division 1, Section 012600 – Contract Modification Procedures

1.2 SUMMARY

- A. Project Management Communications: The Contractor shall use the Internet web-based project management communications tool, Trimble Unity Construct® (Formerly eBuilder) ASP software, and protocols included in that software during this project. The use of project management communications as herein described does not replace or change any contractual responsibilities of the participants.
 - 1. Project management communications is available through Trimble Unity Construct® (Formerly eBuilder) as provided by "Trimble Unity Construct®" in the form and manner required by the Owner.
 - 2. The project communications database is on-line and fully functional. User registration, electronic and computer equipment, and Internet connections are the responsibility of each project participant. The sharing of user accounts is prohibited
- B. Support: Trimble Unity Construct® (Formerly eBuilder) will provide on-going support through on-line help files.
- C. Copyrights and Ownership: Nothing in this specification or the subsequent communications supersedes the parties' obligations and rights for copyright or document ownership as established by the Contract Documents. The use of CAD/BIM files, processes or design information distributed in this system is intended only for the project specified herein.
- D. Purpose: The intent of using Trimble Unity Construct®(Formerly eBuilder) is to improve project work efforts by promoting timely initial communications and responses. Secondly, to reduce the number of paper documents while providing improved record keeping by creation of electronic document files
- E. Authorized Users: Access to the web site will be by individuals who are authorized users.

1. Individuals shall complete the Trimble Unity Construct (Formerly eBuilder) New Company/User Request Form located at the following web site: <https://oa.mo.gov/facilities/vendor-links/contractor-forms>. Completed forms shall be emailed to the following email address: OA.FMDCE-BuilderSupport@oa.mo.gov.
 2. Authorized users will be contacted directly and assigned a temporary user password.
 3. Individuals shall be responsible for the proper use of their passwords and access to data as agents of the company in which they are employed.
- F. Administrative Users: Administrative users have access and control of user licenses and all posted items. DO NOT POST PRIVATE OR YOUR COMPANY CONFIDENTIAL ITEMS IN THE DATABASE! Improper or abusive language toward any party or repeated posting of items intended to deceive or disrupt the work of the project will not be tolerated and will result in deletion of the offensive items and revocation of user license at the sole discretion of the Administrative User(s).
- G. Communications: The use of fax, email and courier communication for this project is discouraged in favor of using Trimble Unity Construct® (Formerly eBuilder) to send messages. Communication functions are as follows:
1. Document Integrity and Revisions:
 - a. Documents, comments, drawings and other records posted to the system shall remain for the project record. The authorship time and date shall be recorded for each document submitted to the system. Submitting a new document or record with a unique ID, authorship, and time stamp shall be the method used to make modifications or corrections.
 - b. The system shall make it easy to identify revised or superseded documents and their predecessors.
 - c. Server or Client-side software enhancements during the life of the project shall not alter or restrict the content of data published by the system. System upgrades shall not affect access to older documents or software.
 2. Document Security:
 - a. The system shall provide a method for communication of documents. Documents shall allow security group assignment to respect the contractual parties communication except for Administrative Users. DO NOT POST PRIVATE OR YOUR COMPANY CONFIDENTIAL ITEMS IN THE DATABASE!
 3. Document Integration:
 - a. Documents of various types shall be logically related to one another and discoverable. For example, requests for information, daily field reports, supplemental sketches and photographs shall be capable of reference as related records.
 4. Reporting:
 - a. The system shall be capable of generating reports for work in progress, and logs for each document type. Summary reports generated by the system shall be available for team members.
 5. Notifications and Distribution:

- a. Document distribution to project members shall be accomplished both within the extranet system and via email as appropriate. Project document distribution to parties outside of the project communication system shall be accomplished by secure email of outgoing documents and attachments, readable by a standard email client.
- 6. Required Document Types:
 - a. RFI, Request for Information.
 - b. Submittals, including record numbering by drawing and specification section.
 - c. Transmittals, including record of documents and materials delivered in hard copy.
 - d. Meeting Minutes.
 - e. Application for Payments (Draft or Pencil).
 - f. Review Comments.
 - g. Field Reports.
 - h. Construction Photographs.
 - i. Drawings.
 - j. Supplemental Sketches.
 - k. Schedules.
 - l. Specifications.
 - m. Request for Proposals
 - n. Designer's Supplemental Instructions
 - o. Punch Lists
- H. Record Keeping: Except for paper documents, which require original signatures and large format documents (greater than 8½ x 11 inches), all other 8½ x 11 inches documents shall be submitted by transmission in electronic form to the Trimble Unity Construct® (Formerly eBuilder) web site by licensed users.
 - a. The Owner and his representatives, the Designer and his consultants, and the Contractor and his Subcontractors and suppliers at every tier shall respond to documents received in electronic form on the web site and consider them as if received in paper document form.
 - b. The Owner and his representatives, the Designer and his consultants, and the Contractor and his Subcontractors and suppliers at every tier reserves the right to and shall reply or respond by transmissions in electronic form on the web site to documents actually received in paper document form.
 - c. The Owner and his representatives, the Designer and his consultants, and the Contractor and his Subcontractors and suppliers at every tier reserves the right to and shall copy any paper document into electronic form and make same available on the web site.
- I. Minimum Equipment and Internet Connection: In addition to other requirements specified in this Section, the Owner and his representatives, the Construction Manager and his representatives, the Architect and his consultants, and the Contractor and his sub-contractors and suppliers at every tier required to have a user license(s) shall be responsible for the following:

1. Providing suitable computer systems for each licensed user at the users normal work location¹ with high-speed Internet access, i.e. DSL, local cable company's Internet connection, or T1 connection.
2. Each of the above referenced computer systems shall have the following minimum system² and software requirements:
 - a. Desktop configuration (Laptop configurations are similar and should be equal to or exceed desktop system.)
 - 1) Operating System: Windows XP or newer
 - 2) Internet Browser: Internet Explorer 6.01SP2+ (Recommend IE7.0+)
 - 3) Minimum Recommend Connection Speed: 256K or above
 - 4) Processor Speed: 1 Gigahertz and above
 - 5) RAM: 512 mb
 - 6) Operating system and software shall be properly licensed.
 - 7) Internet Explorer version 7 (current version is a free distribution for download). This specification is not intended to restrict the host server or client computers provided that industry standard HTTP clients may access the published content.
 - 8) Adobe Acrobat Reader (current version is a free distribution for download).
 - 9) Users should have the standard Microsoft Office Suite (current version must be purchased) or the equivalent.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable.)

END OF SECTION 013115

¹ The normal work location is the place where the user is assigned for more than one-half of his time working on this project.

² The minimum system herein will not be sufficient for many tasks and may not be able to process all documents and files stored in the Trimble Unity Construct® (Formerly eBuilder) Documents area.

SECTION 013200 – SCHEDULE – BAR CHART

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes requirements for a Bar Chart Schedule for the project construction activities, schedule of submittals, and schedule for testing.

PART 2 - PRODUCTS – (Not Applicable)

PART 3 - EXECUTION

3.1 SUBMITTAL PROCEDURES

- A. The Contractor shall submit to the Designer, within ten (10) working days following the Notice to Proceed, a Progress Schedule including Schedule of Values showing the rate of progress the Contractor agrees to maintain and the order in which he proposed to carry out the Work. No payments shall be made to the Contractor until the Progress Schedule has been approved by the Owner.
 - 1. The Schedule of Values must have the following line items included with the value of the item as indicated below:
 - a. O&M's (Owner's Manual)
 - 1) \$1,000,000.00 (One million) and under – 2% of the total contract amount
 - 2) Over \$1,000,000.00 (One million) – 1% of the total contract amount
 - b. Close Out Documents
 - 1) \$1,000,000.00 (One million) and under – 2% of the total contract amount
 - 2) Over \$1,000,000.00 (One million) – 1% of the total contract amount
 - c. General Conditions
 - 1) No more than 10%
- B. The Contractor shall submit an updated Schedule for presentation at each Monthly Progress Meeting. The Schedule shall be updated by the Contractor as necessary to reflect the current Schedule and its relationship to the original Schedule. The updated Schedule shall reflect any changes in the logic, sequence, durations, or completion date.

Payments to the Contractor shall be suspended if the Progress Schedule is not adequately updated to reflect actual conditions.

- C. The Contractor shall submit Progress Schedules to Subcontractors to permit coordinating their Progress Schedules to the general construction Work. The Contractor shall coordinate preparation and processing of Schedules and reports with performance of other construction activities.

3.2 CONSTRUCTION PROGRESS SCHEDULE – BAR CHART SCHEDULE

- A. Bar-Chart Schedule: The Contractor shall prepare a comprehensive, fully developed, horizontal bar chart-type Contractor's Construction Schedule. The Contractor for general construction shall prepare the Construction Schedule for the entire Project. The Schedule shall show the percentage of work to be completed at any time, anticipated monthly payments by Owner, as well as significant dates (such as completion of excavation, concrete foundation work, underground lines, superstructure, rough-ins, enclosure, hanging of fixtures, etc.) which shall serve as check points to determine compliance with the approved Schedule. The Schedule shall also include an activity for the number of "Facility Interruption Days" specified in Section 011000 – Summary of Work.

1. The Contractor shall provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week.
 - a. If practical, use the same Schedule of Values breakdown for schedule time bars.
2. The Contractor shall provide a base activity time bar showing duration for each construction activity. Each bar is to indicate start and completion dates for the activity. The Contractor is to place a contrasting bar below each original schedule activity time for indicating actual progress and planned remaining duration for the activity.
3. The Contractor shall prepare the Schedule on a minimal number of separate sheets to readily show the data for the entire construction period.
4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on schedule with other construction activities. Include minor elements involved in the overall sequence of the Work. Show each activity in proper sequence. Indicate graphically the sequences necessary for completion of related portions of the Work.
5. Coordinate the Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittal Schedule, progress reports, payment requests, and other required schedules and reports.
6. Indicate the Intent to Award and the Contract Substantial Completion dates on the schedule.

- B. Phasing: The Work shall be completed in a single phase. Provide notations on the schedule to show how the sequence of the Work is affected by the following:

1. Work by separate Contractors

2. Work by the Owner
 3. Pre-purchased materials
 4. Coordination with existing construction
 5. Limitations of continued occupancies
 6. Un-interruptible services
 7. Partial Occupancy prior to Substantial Completion
 8. Site restrictions
 9. Provisions for future construction
 10. Seasonal variations
 11. Environmental control
- C. Work Stages: Use crosshatched bars to indicate important stages of construction for each major portion of the Work. Such stages include, but are not necessarily limited to, the following:
1. Subcontract awards
 2. Submittals
 3. Purchases
 4. Mockups
 5. Fabrication
 6. Sample testing
 7. Deliveries
 8. Installation
 9. Testing
 10. Adjusting
 11. Curing
 12. Startup and placement into final use and operation
- D. Area Separations: Provide a separate time bar to identify each major area of construction for each major portion of the Work. For the purposes of this Article, a “major area” is a story of construction, a separate building, or a similar significant construction element.
1. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
 - a. Structural completion.
 - b. Permanent space enclosure
 - c. Completion of mechanical installation
 - d. Completion of the electrical portion of the Work
 - e. Substantial Completion

3.3 SCHEDULE OF SUBMITTALS

- A. Upon acceptance of the Construction Progress Schedule, prepare and submit a complete schedule of submittals. Coordinate the submittal schedule with Section 013300 SUBMITTALS, the approved Construction Progress Schedule, list of subcontracts, Schedule of Values and the list of products.
- B. Prepare the schedule in chronological order. Provide the following information
 - 1. Scheduled date for the first submittal
 - 2. Related Section number
 - 3. Submittal category
 - 4. Name of the Subcontractor
 - 5. Description of the part of the Work covered
 - 6. Scheduled date for resubmittal
 - 7. Scheduled date for the Designer's final release or approval
- C. Distribution: Following the Designer's response to the initial submittal schedule, print and distribute copies to the Designer, Owner, subcontractors, and other parties required to comply with submittal dates indicated.
 - 1. Post copies in the Project meeting room and temporary field office.
 - 2. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned part of the Work and are no longer involved in construction activities.
- D. Schedule Updating: Revise the schedule after each meeting or other activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

3.4 SCHEDULE OF INSPECTIONS AND TESTS

- A. Prepare a schedule of inspections, tests, and similar services required by the Contract Documents. Submit the schedule with (15) days of the date established for commencement of the Contract Work. The Contractor is to notify the testing agency at least (5) working days in advance of the required tests unless otherwise specified.
- B. Form: This schedule shall be in tabular form and shall include, but not be limited to, the following:
 - 1. Specification Section number
 - 2. Description of the test
 - 3. Identification of applicable standards
 - 4. Identification of test methods
 - 5. Number of tests required
 - 6. Time schedule or time span for tests

St. Louis Veteran's Home Renovation
St. Louis, MO
State Project No. U2307-01
CannonDesign Project No. 005680.00

June 26, 2025
Issued for Bid

7. Entity responsible for performing tests
 8. Requirements for taking samples
 9. Unique characteristics of each service
- C. Distribution: Distribute the schedule to the Owner, Architect, and each party involved in performance of portions of the Work where inspections and tests are required.

END OF SECTION 013200

SECTION 013300 – SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract including General and Supplementary Conditions, Bid Form, and other Division 1 Specification Sections apply to this Section.
- B. Division 1, Section 013115 “Project Management Communications” for administrative requirements for communications.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for submittals required for performance of the Work including the following:
 - 1. Shop Drawings
 - 2. Product Data
 - 3. Samples
 - 4. Quality Assurance Submittals
 - 5. Construction Photographs
 - 6. Operating and Maintenance Manuals
 - 7. Warranties
- B. Administrative Submittals: Refer to General and Supplementary Conditions other applicable Division 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following:
 - 1. Construction Progress Schedule including Schedule of Values
 - 2. Performance and Payment Bonds
 - 3. Insurance Certificates
 - 4. Applications for Payment
 - 5. Certified Payroll Reports
 - 6. Partial and Final Receipt of Payment and Release Forms
 - 7. Affidavit – Compliance with Prevailing Wage Law
 - 8. Record Drawings
 - 9. Notifications, Permits, etc.
- C. The Contractor is obliged and responsible to check all shop drawings and schedules to assure compliance with contract plans and specifications. The Contractor is responsible for the content of the shop drawings and coordination with other contract work. Shop drawings and schedules shall indicate, in detail, all parts of an Item or Work including erection and setting instructions and integration with the Work of other trades.

- D. The Contractor shall at all times make a copy, of all approved submittals, available on site to the Construction Representative.

1.3 SUBMITTAL PROCEDURES

- A. The Contractor shall comply with the General and Supplementary Conditions and other applicable sections of the Contract Documents. The Contractor shall submit, with such promptness as to cause no delay in his work or in that of any other contractors, all required submittals indicated in Part 3.1 of this section and elsewhere in the Contract Documents. Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
 - 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 elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
 - a. The Designer reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.
- B. Each drawing and/or series of drawings submitted must be accompanied by a letter of transmittal giving a list of the titles and numbers of the drawings. Each series shall be numbered consecutively for ready reference and each drawing shall be marked with the following information:
 - 1. Date of Submission
 - 2. Name of Project
 - 3. Location
 - 4. Section Number of Specification
 - 5. State Project Number
 - 6. Name of Submitting Contractor
 - 7. Name of Subcontractor
 - 8. Indicate if Item is submitted as specified or as a substitution

1.4 SHOP DRAWINGS

- A. Comply with the General Conditions, Article 3.2.
- B. The Contractor shall submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.

- C. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates, and similar drawings including the following information:
 - 1. Dimensions
 - 2. Identification of products and materials included by sheet and detail number
 - 3. Compliance with specified standards
 - 4. Notation of coordination requirements
 - 5. Notation of dimensions established by field measurement
 - 6. Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8½"x11" but no larger than 36"x48".

1.5 PRODUCT DATA

- A. The Contractor shall comply with the General Conditions, Article 3.2.
- B. The Contractor shall collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information, such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves.
 - 1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products that are not required, mark copies to indicate the applicable information including the following information:
 - a. Manufacturer's printed recommendations
 - b. Compliance with Trade Association standards
 - c. Compliance with recognized Testing Agency standards
 - d. Application of Testing Agency labels and seals
 - e. Notation of dimensions verified by field measurement
 - f. Notation of coordination requirements
 - 2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

1.6 SAMPLES

- A. The Contractor shall comply with the General Conditions, Article 3.2.
- B. The Contractor shall submit full-size, fully fabricated samples, cured and finished as specified, and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern.
 - 1. The Contractor shall mount or display samples in the manner to facilitate review of qualities indicated. Prepare samples to match the Designer's sample including the following:
 - a. Specification Section number and reference

- b. Generic description of the Sample
 - c. Sample source
 - d. Product name or name of the Manufacturer
 - e. Compliance with recognized standards
 - f. Availability and delivery time
2. The Contractor shall submit samples for review of size, kind, color, pattern, and texture. Submit samples for a final check of these characteristics with other elements and a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
- a. Where variation in color, pattern, texture, or other characteristic is inherent in the material or product represented, submit at least three (3) multiple units that show approximate limits of the variations.
 - b. Refer to other Specification Sections for requirements for samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.
 - c. Refer to other Sections for samples to be returned to the Contractor for incorporation in the Work. Such samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of sample submittals.
 - d. Samples not incorporated into the Work, or otherwise designated as the Owner's property, are the property of the Contractor and shall be removed from the site prior to Substantial Completion.
3. Field samples are full-size examples erected onsite to illustrate finishes, coatings, or finish materials and to establish the Project standard.
- a. The Contractor shall comply with submittal requirements to the fullest extent possible. The Contractor shall process transmittal forms to provide a record of activity.

1.7 QUALITY ASSURANCE DOCUMENTS

- A. The Contractor shall comply with the General Conditions, Article 3.2
- B. The Contractor shall submit quality control submittals including design data, certifications, manufacturer's instructions, manufacturer's field reports, and other quality-control submittals as required under other Sections of the Specifications.
- C. Certifications: Where other Sections of the Specifications require certification that a product, material, or installation complies with specified requirements, submit a notarized certification from the Manufacturer certifying compliance with specified requirements.
 - 1. Signature: Certification shall be signed by an officer of the Manufacturer or other individual authorized to contractually bind the Company.

- D. Inspection and Test Reports: The Contractor shall submit the required inspection and test reports from independent testing agencies as specified in this Section and in other Sections of the Contract Documents.
- E. Construction Photographs: The Contractor shall submit record construction photographs as specified in this Section and in other Sections of the Contract Documents.
 - 1. The Contractor shall submit digital photographs. The Construction Administrator shall determine the quantity and naming convention at the preconstruction meeting.
 - 2. The Contractor shall identify each photograph with project name, location, number, date, time, and orientation.
 - 3. The Contractor shall submit progress photographs monthly unless specified otherwise. Photographs shall be taken one (1) week prior to submitting.
 - 4. The Contractor shall take four (4) site photographs from differing directions and a minimum of five (5) interior photographs indicating the relative progress of the Work.

1.8 OPERATING AND MAINTENANCE MANUALS AND WARRANTIES

- A. The Contractor shall submit all required manufacturer's operating instructions, maintenance/service manuals, and warranties in accordance with the General Conditions, Article 3.5, and Supplementary Conditions along with this and other Sections of the Contract Documents.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 REQUIRED SUBMITTALS

- A. Contractor shall submit the following information for materials and equipment to be provided under this contract.
 - 1. See attached E-builder submittal register.

END OF SECTION 013300

SUBMITTAL REGISTER

SPEC SECTION	TITLE	CATEGORY
013200	Schedules	Construction Schedule
013200	Schedules	Schedule of Values
013200	Schedules	List of Subcontractors
013200	Schedules	Major Material Suppliers
024119	Selective Structure Demolition	Shop Drawings
024119	Selective Structure Demolition	Certifications
033000	Cast-In-Place Concrete	Shop Drawings
033000	Cast-In-Place Concrete	Sample
033000	Cast-In-Place Concrete	Certifications
033000	Cast-In-Place Concrete	Test Report
033000	Cast-In-Place Concrete (Inspection)	Test Report
033540	Concrete Densifier-Sealer Treatment	Product Data
033540	Concrete Densifier-Sealer Treatment	Certification
033540	Concrete Densifier-Sealer Treatment	Operation / Maintenance Manual
033540	Concrete Densifier-Sealer Treatment	Warranty
035416	Hydraulic Cement Underlayment	Product Data
051200	Structural Steel Framing	Shop Drawings
051200	Structural Steel Framing	Product Data
051200	Structural Steel Framing	Certification
051200	Structural Steel Framing	Test Report
051200	Structural Steel Framing (Inspection)	Test Report
055000	Metal Fabrications	Shop Drawings
055000	Metal Fabrications	Certification
061000	Rough Carpentry	Shop Drawings
061000	Rough Carpentry	Certification
061000	Rough Carpentry	Test Report
064023	Interior Architectural Woodwork	Shop Drawings
064023	Interior Architectural Woodwork	Product Data
064023	Interior Architectural Woodwork	Sample
064023	Interior Architectural Woodwork	Certification
064023	Interior Architectural Woodwork	Operation / Maintenance Manual
064216	Flush Wood Paneling	Shop Drawings
064216	Flush Wood Paneling	Product Data
064216	Flush Wood Paneling	Sample
064216	Flush Wood Paneling	Certification
072100	Thermal Insulation	Product Data
076200	Sheet Metal Flashing and Trim	Shop Drawings
076200	Sheet Metal Flashing and Trim	Product Data
076200	Sheet Metal Flashing and Trim	Sample
076200	Sheet Metal Flashing and Trim	Certification
076200	Sheet Metal Flashing and Trim	Warranty
078413	Penetration Firestopping	Shop Drawings
078413	Penetration Firestopping	Product Data

SPEC SECTION	TITLE	CATEGORY
078413	Penetration Firestopping	Certification
078413	Penetration Firestopping	Test Report
078413	Penetration Firestopping (Inspection)	Test Report
078413	Penetration Firestopping	Operation / Maintenance Manual
078443	Joint Firestopping	Shop Drawings
078443	Joint Firestopping	Product Data
078443	Joint Firestopping	Certification
078443	Joint Firestopping	Test Report
078443	Joint Firestopping (Inspection)	Test Report
078443	Joint Firestopping	Operation / Maintenance Manual
079200	Joint Sealants	Product Data
079200	Joint Sealants	Sample
079200	Joint Sealants	Test Report
081113	Hollow Metal Doors and Frames	Shop Drawings
081113	Hollow Metal Doors and Frames	Product Data
081113	Hollow Metal Doors and Frames	Certification
081113	Hollow Metal Doors and Frames	Test Report
081416	Flush Wood Doors	Shop Drawings
081416	Flush Wood Doors	Product Data
081416	Flush Wood Doors	Sample
081416	Flush Wood Doors	Warranty
083113	Access Door and Frames	Product Data
087100	Door Hardware	Shop Drawings
087100	Door Hardware	Product Data
087100	Door Hardware (Manf. Instructions)	Operation / Maintenance Manual
087100	Door Hardware	Test Report
087100	Door Hardware (Inspection)	Test Report
087100	Door Hardware	Operation / Maintenance Manual
087100	Door Hardware	Warranty
088000	Glazing	Product Data
088000	Glazing	Certification
088813	Fire-Resistant Glazing	Product Data
088813	Fire-Resistant Glazing	Certification
088813	Fire-Resistant Glazing	Warranty
089119	Fixed Louvers	Shop Drawings
089119	Fixed Louvers	Product Data
089119	Fixed Louvers	Sample
089119	Fixed Louvers	Test Report
092216	Non-Structural Metal Framing	Shop Drawings
092216	Non-Structural Metal Framing	Product Data
092216	Non-Structural Metal Framing	Certification
092900	Gypsum Board	Product Data
093000	Tiling	Shop Drawings
093000	Tiling	Product Data
093000	Tiling	Sample

SPEC SECTION	TITLE	CATEGORY
093000	Tiling	Certification
093000	Tiling	Operation / Maintenance Manual
095113	Acoustical Panel Ceilings	Product Data
095113	Acoustical Panel Ceilings	Sample
095113	Acoustical Panel Ceilings	Certification
095113	Acoustical Panel Ceilings	Test Report
095113	Acoustical Panel Ceilings (Inspection)	Test Report
095113	Acoustical Panel Ceilings	Operation / Maintenance Manual
096513	Resilient Base Accessories	Product Data
096513	Resilient Base Accessories	Sample
096513	Resilient Base Accessories	Operation / Maintenance Manual
096519	Resilient Tile Flooring	Shop Drawings
096519	Resilient Tile Flooring	Product Data
096519	Resilient Tile Flooring	Sample
096519	Resilient Tile Flooring	Certification
096519	Resilient Tile Flooring	Operation / Maintenance Manual
096723	Resinous Flooring	Product Data
096723	Resinous Flooring	Sample
096723	Resinous Flooring	Certification
096813	Tile Carpeting	Shop Drawings
096813	Tile Carpeting	Product Data
096813	Tile Carpeting	Sample
096813	Tile Carpeting	Certification
096813	Tile Carpeting	Operation / Maintenance Manual
096813	Tile Carpeting	Warranty
099123	Interior Painting	Product Data
099123	Interior Painting	Sample
099123	Interior Painting	Operation / Maintenance Manual
099600	High-Performance Coatings	Product Data
099600	High-Performance Coatings	Sample
099600	High-Performance Coatings	Operation / Maintenance Manual
101400	Code Required Signage	Shop Drawings
101400	Code Required Signage	Product Data
101400	Code Required Signage	Sample
101400	Code Required Signage	Certification
101400	Code Required Signage	Warranty
102123	Cubicle Curtains and Track	Shop Drawings
102123	Cubicle Curtains and Track	Product Data
102123	Cubicle Curtains and Track	Operation / Maintenance Manual
102600	Wall and Door Protection	Shop Drawings
102600	Wall and Door Protection	Product Data
102600	Wall and Door Protection	Sample
102600	Wall and Door Protection	Certification
102600	Wall and Door Protection	Operation / Maintenance Manual
102600	Wall and Door Protection	Warranty

SPEC SECTION	TITLE	CATEGORY
102800	Toilet, Bath, and Laundry Accessories	Product Data
102800	Toilet, Bath, and Laundry Accessories	Operation / Maintenance Manual
104313	Debilbrillator Cabinets	Shop Drawings
104313	Debilbrillator Cabinets	Product Data
104313	Debilbrillator Cabinets	Sample
104413	Fire Protection Cabinets	Shop Drawings
104413	Fire Protection Cabinets	Product Data
104413	Fire Protection Cabinets	Sample
104413	Fire Protection Cabinets	Operation / Maintenance Manual
104416	Fire Extinguishers	Product Data
104416	Fire Extinguishers	Operation / Maintenance Manual
104416	Fire Extinguishers	Warranty
105126	Solid Phenolic Lockers	Shop Drawings
105126	Solid Phenolic Lockers	Product Data
105126	Solid Phenolic Lockers	Sample
105126	Solid Phenolic Lockers	Operation / Maintenance Manual
105126	Solid Phenolic Lockers	Warranty
123530	Residential Casework	Shop Drawings
123530	Residential Casework	Product Data
123530	Residential Casework	Sample
123530	Residential Casework	Certification
210500	Common Work Result for Fire Suppression	Product Data
210500	Common Work Result for Fire Suppression	Certification
210548	Vibration and Seismic Controls for Fire-Suppression Piping and Equipment	Shop Drawings
210548	Vibration and Seismic Controls for Fire-Suppression Piping and Equipment	Product Data
210548	Vibration and Seismic Controls for Fire-Suppression Piping and Equipment	Certification
211000	Water-Based Fire Suppression Systems	Shop Drawings
211000	Water-Based Fire Suppression Systems	Product Data
211000	Water-Based Fire Suppression Systems	Certification
211000	Water-Based Fire Suppression Systems	Operation / Maintenance Manual
220500	Common Work Results for Plumbing	Product Data
220500	Common Work Results for Plumbing	Certification
220516	Expansion Fittings and Loops	Product Data
220516	Expansion Fittings and Loops	Certification
220516	Expansion Fittings and Loops	Operation / Maintenance Manual
220517	Sleeves and Sleeve Seals for Plumbing Piping	Product Data
220519	Meters and Gages for Plumbing Piping	Shop Drawings
220519	Meters and Gages for Plumbing Piping	Product Data
220519	Meters and Gages for Plumbing Piping	Certification

SPEC SECTION	TITLE	CATEGORY
220523	General Duty Valves for Plumbing Piping	Product Data
220529	Hangers and Supports for Plumbing Piping and Equipment	Shop Drawings
220529	Hangers and Supports for Plumbing Piping and Equipment	Product Data
220529	Hangers and Supports for Plumbing Piping and Equipment	Certification
220548	Vibration and Seismic Controls for Plumbing Piping and Equipment	Shop Drawings
220548	Vibration and Seismic Controls for Plumbing Piping and Equipment	Product Data
220548	Vibration and Seismic Controls for Plumbing Piping and Equipment	Certification
220548	Vibration and Seismic Controls for Plumbing Piping and Equipment	Test Report
220548	Vibration and Seismic Controls for Plumbing Piping and Equipment	Operation / Maintenance Manual
220553	Identification for Plumbing Piping and Equipments	Shop Drawings
220553	Identification for Plumbing Piping and Equipments	Product Data
220553	Identification for Plumbing Piping and Equipments	Sample
220553	Identification for Plumbing Piping and Equipments	Operation / Maintenance Manual
220700	Plumbing Insulation	Shop Drawings
220700	Plumbing Insulation	Product Data
220700	Plumbing Insulation	Certification
220700	Plumbing Insulation	Test Report
221116	Domestic Water Piping	Product Data
221116	Domestic Water Piping	Certification
221116	Domestic Water Piping	Test Report
221119	Domestic Water Piping Specialties	Shop Drawings
221119	Domestic Water Piping Specialties	Product Data
221119	Domestic Water Piping Specialties	Test Report
221119	Domestic Water Piping Specialties	Operation / Maintenance Manual
221316	Sanitary Waste, Vent, and Storm Piping	Shop Drawings
221316	Sanitary Waste, Vent, and Storm Piping	Product Data
221316	Sanitary Waste, Vent, and Storm Piping	Test Report
221319	Sanitary Waste, Vent and Storm Piping Specialties	Product Data
221319	Sanitary Waste, Vent and Storm Piping Specialties	Test Report
221319	Sanitary Waste, Vent and Storm Piping Specialties	Operation / Maintenance Manual
224000	Plumbing Fixtures	Shop Drawings

SPEC SECTION	TITLE	CATEGORY
224000	Plumbing Fixtures	Product Data
224000	Plumbing Fixtures	Operation / Maintenance Manual
224000	Plumbing Fixtures	Warranty
230130	HVAC Air Duct Cleaning	Product Data
230130	HVAC Air Duct Cleaning	Certification
230130	HVAC Air Duct Cleaning	Test Report
230131	HVAC Air Distribution System Cleaning	Shop Drawings
230131	HVAC Air Distribution System Cleaning	Product Data
230131	HVAC Air Distribution System Cleaning	Test Report
230500	Common Work Results for HVAC	Shop Drawings
230500	Common Work Results for HVAC	Product Data
230500	Common Work Results for HVAC (Wiring Diagram)	Shop Drawings
230500	Common Work Results for HVAC	Operation / Maintenance Manual
230516	Expansion Fittings and Loops for HVAC Piping	Shop Drawings
230516	Expansion Fittings and Loops for HVAC Piping	Product Data
230516	Expansion Fittings and Loops for HVAC Piping	Certification
230516	Expansion Fittings and Loops for HVAC Piping	Operation / Maintenance Manual
230517	Sleeves and Sleeve Seals for HVAC Piping	Product Data
230518	Escutcheons for HVAC Piping	Product Data
230519	Meters and Gages for HVAC Piping	Shop Drawings
230519	Meters and Gages for HVAC Piping	Product Data
230519	Meters and Gages for HVAC Piping	Certification
230519	Meters and Gages for HVAC Piping	Operation / Maintenance Manual
230523	General Duty Valves for HVAC Piping	Product Data
230529	Hangers and Supports for HVAC Piping and Equipment	Shop Drawings
230529	Hangers and Supports for HVAC Piping and Equipment	Product Data
230529	Hangers and Supports for HVAC Piping and Equipment	Certification
230548	Vibration, Seismic and Wind Controls for HVAC	Shop Drawings
230548	Vibration, Seismic and Wind Controls for HVAC	Product Data
230548	Vibration, Seismic and Wind Controls for HVAC	Certification
230548	Vibration, Seismic and Wind Controls for HVAC	Test Report
230548	Vibration, Seismic and Wind Controls for HVAC	Operation / Maintenance Manual

SPEC SECTION	TITLE	CATEGORY
230553	Identification for HVAC Piping and Equipment	Shop Drawings
230553	Identification for HVAC Piping and Equipment	Product Data
230553	Identification for HVAC Piping and Equipment	Sample
230593	Testing, Adjusting, and Balancing for HVAC	Shop Drawings
230593	Testing, Adjusting, and Balancing for HVAC	Certification
230593	Testing, Adjusting, and Balancing for HVAC	Test Report
230593	Testing, Adjusting, and Balancing for HVAC	Warranty
230700	HVAC Insulation	Product Data
230900	Instrumentation and Control for HAVC	Shop Drawings
230900	Instrumentation and Control for HAVC	Certification
230900	Instrumentation and Control for HAVC	Operation / Maintenance Manual
230900	Instrumentation and Control for HAVC	Warranty
232113	Hydronic Piping	Shop Drawings
232113	Hydronic Piping	Product Data
232113	Hydronic Piping	Certification
232113	Hydronic Piping	Test Report
232113	Hydronic Piping	Operation / Maintenance Manual
232116	Hydronic Piping Specialties	Product Data
232116	Hydronic Piping Specialties	Operation / Maintenance Manual
233113	Metal Ducts	Shop Drawings
233113	Metal Ducts	Product Data
233113	Metal Ducts	Certification
233300	Air Duct Accessories	Shop Drawings
233300	Air Duct Accessories (Wiring Diagram)	Shop Drawings
233300	Air Duct Accessories	Operation / Maintenance Manual
233416	Centrifugal HVAC Fans	Shop Drawings
233416	Centrifugal HVAC Fans	Product Data
233416	Centrifugal HVAC Fans	Test Report
233416	Centrifugal HVAC Fans	Operation / Maintenance Manual
233713	Diffusers, Register, and Grilles	Shop Drawings
233713	Diffusers, Register, and Grilles	Product Data
233713	Diffusers, Register, and Grilles	Sample
238219	Fan Coil Units	Shop Drawings
238219	Fan Coil Units	Product Data
238219	Fan Coil Units	Test Report
238219	Fan Coil Units (Wiring Diagram)	Shop Drawings
238219	Fan Coil Units	Operation / Maintenance Manual
260505	Electrical Inspections and Testing	Certification
260505	Electrical Inspections and Testing	Test Report
260505	Electrical Inspections and Testing	Operation / Maintenance Manual
260519	Low Voltage Electrical Power Conductors and Cables (100-600 Volts)	Shop Drawings

SPEC SECTION	TITLE	CATEGORY
260519	Low Voltage Electrical Power Conductors and Cables (100-600 Volts)	Product Data
260519	Low Voltage Electrical Power Conductors and Cables (100-600 Volts)	Test Report
260519	Low Voltage Electrical Power Conductors and Cables (100-600 Volts)	Operation / Maintenance Manual
260526	Grounding and Bonding	Certification
260526	Grounding and Bonding	Test Report
260526	Grounding and Bonding	Operation / Maintenance Manual
260529	Hangers and Supports	Shop Drawings
260529	Hangers and Supports	Product Data
260529	Hangers and Supports	Certification
260533	Raceways	Shop Drawings
260533	Raceways	Product Data
260533	Raceways	Test Report
260533	Raceways	Operation / Maintenance Manual
260535	Boxes and Cabinets	Shop Drawings
260544	Sleeves and Sleeve Seals for Raceways and Cabling	Shop Drawings
260548	Vibration and Seismic Controls	Shop Drawings
260548	Vibration and Seismic Controls	Product Data
260548	Vibration and Seismic Controls	Certification
260548	Vibration and Seismic Controls	Test Report
260553	Electrical Identification	Shop Drawings
260553	Electrical Identification	Product Data
260553	Electrical Identification	Sample
260575	Conduit Rough-In Systems	Shop Drawings
260575	Conduit Rough-In Systems	Certification
260578	Multi-Service Boxes and Assemblies	Shop Drawings
260578	Multi-Service Boxes and Assemblies	Product Data
260578	Multi-Service Boxes and Assemblies	Sample
260578	Multi-Service Boxes and Assemblies	Operation / Maintenance Manual
262726	Wiring Devices	Product Data
262726	Wiring Devices	Certification
262726	Wiring Devices	Operation / Maintenance Manual
262800	Protective Devices	Shop Drawings
262800	Protective Devices	Product Data
262800	Protective Devices	Certification
262800	Protective Devices	Test Report
262800	Protective Devices	Operation / Maintenance Manual
264113	Lighting Protection System	Shop Drawings
264113	Lighting Protection System	Product Data
264113	Lighting Protection System	Certification
265100	Interior Lighting	Shop Drawings
265100	Interior Lighting	Product Data

SPEC SECTION	TITLE	CATEGORY
265100	Interior Lighting	Test Report
265100	Interior Lighting (Wiring Diagram)	Shop Drawings
265100	Interior Lighting	Operation / Maintenance Manual
265100	Interior Lighting	Warranty
270500	Common Work Results for Communications	Shop Drawings
270500	Common Work Results for Communications	Operation / Maintenance Manual
270526	Grounding and Bounding for Communications Systems	Shop Drawings
270526	Grounding and Bounding for Communications Systems	Product Data
270526	Grounding and Bounding for Communications Systems	Sample
270526	Grounding and Bounding for Communications Systems	Certification
270526	Grounding and Bounding for Communications Systems	Test Report
270526	Grounding and Bounding for Communications Systems	Operation / Maintenance Manual
270526	Grounding and Bounding for Communications Systems	Warranty
271000	Structured Telecommunications Cabling Systems	Shop Drawings
271000	Structured Telecommunications Cabling Systems	Sample
271000	Structured Telecommunications Cabling Systems	Warranty
275223	Nurse Call Systems	Shop Drawings
275223	Nurse Call Systems	Test Report
275223	Nurse Call Systems	Operation / Maintenance Manual
275223	Nurse Call Systems	Warranty
280500	Common Work Results Electronic Safety and Security	Shop Drawings
280500	Common Work Results Electronic Safety and Security	Operation / Maintenance Manual
280500	Common Work Results Electronic Safety and Security	Warranty
283105	Fire Alarm System Extension	Shop Drawings
283105	Fire Alarm System Extension	Product Data
283105	Fire Alarm System Extension	Certification
283105	Fire Alarm System Extension	Test Report
283105	Fire Alarm System Extension	Operation / Maintenance Manual

SECTION 013513.28 - SITE SECURITY AND HEALTH REQUIREMENTS (VETERANS, STATE FAIR, MONG)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes general Institution rules.
- B. This Section includes requirements for environments that employees are domiciled in, or public participation in program activities in or adjacent to the Scope of Work area:
 - 1. The Contractor shall have the applicable measures specified below in-place any time demolition or construction activities occur in occupied or non-occupied project work areas.
 - 2. The Contractor shall complete all specified cleaning procedures and receive clearance from the Construction Representative prior to removing any barriers and other precautionary measures – even for areas that the employees or public do not occupy during construction.

1.3 SUBMITTALS

- A. List of required submittals:
 - 1. Materials Safety Data Sheets for all hazardous materials to be brought onsite.
 - 2. Schedule of proposed shutdowns, if applicable.
 - 3. A list of the names of all employees who will submit fingerprints for a background check, and the signed privacy documents identified below for each employee.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 ACCESS TO THE SITE

- A. The Contractor shall arrange with Facility Representatives to establish procedures for the controlled entry of workers and materials into the work areas at the Facility.
- B. The Contractor shall establish regular working hours with Facility Representatives. The Contractor must report changes in working hours or overtime to Facility Representatives and obtain approval twenty-four (24) hours ahead of time. The Contractor shall report emergency overtime to Facility Representatives as soon as it is evident that overtime is needed. The Contractor must obtain approval from Facility Representatives for all work performed after

dark.

- C. The Contractor shall provide the name and phone number of the Contractor's employee or agent who is in charge onsite; this individual must be able to be contacted in case of emergency. The Contractor must be able to furnish names and address of all employees upon request.
- D. All construction personnel shall visibly display issued identification badges

3.2 FIRE PROTECTION, SAFETY, AND HEALTH CONTROLS

- A. The Contractor shall take all necessary precautions to guard against and eliminate possible fire hazards.
 - 1. Onsite burning is prohibited.
 - 2. The Contractor shall store all flammable or hazardous materials in proper containers located outside the buildings or offsite, if possible.
 - 3. The Contractor shall provide and maintain, in good order, during construction fire extinguishers as required by the National Fire Protection Association. In areas of flammable liquids, asphalt, or electrical hazards, 15-pound carbon dioxide or 20-pound dry chemical extinguishers shall be provided.
- B. The Contractor shall not obstruct streets or walks without permission from the Owner's Construction Representative and Facility Representatives.
- C. The Contractor's personnel shall not exceed the speed limit of 15 mph while at the Facility unless otherwise posted.
- D. The Contractor shall take all necessary, reasonable measures to reduce air and water pollution by any material or equipment used during construction. The Contractor shall keep volatile wastes in covered containers and shall not dispose of volatile wastes or oils in storm or sanitary drains.
- E. The Contractor shall keep the project site neat, orderly, and in a safe condition at all times. The Contractor shall immediately remove all hazardous waste and shall not allow rubbish to accumulate. The Contractor shall provide onsite containers for collection of rubbish and shall dispose of it at frequent intervals during the progress of the Work.
- F. Fire exits, alarm systems, and sprinkler systems shall remain fully operational at all times, unless written approval is received from the Owner's Construction Representative and the appropriate Facility Representative at least twenty-four (24) hours in advance. The Contractor shall submit a written time schedule for any proposed shutdowns.
- G. For all hazardous materials brought onsite, Material Safety Data Sheets shall be on site and readily available upon request at least a day before delivery.
- H. Alcoholic beverages or illegal substances shall not be brought upon the Facility premises. The Contractor's workers shall not be under the influence of any intoxicating substances while on the Facility premises.

3.3 SECURITY CLEARANCES AND RESTRICTIONS

A. FMDC CONTRACTOR BACKGROUND AND ID BADGE PROCESS

1. All employees of the Contractor are required to submit fingerprints to the Missouri State Highway Patrol to enable the Office of Administration, Division of Facilities Management, Design and Construction (FMDC) to receive state and national criminal background checks on such employees. FMDC reserves the right to prohibit any employee of the Contractor from performing work in or on the premises of any facility owned, operated, or utilized by the State of Missouri for any reason.
2. The Contractor shall ensure all of its employees submit fingerprints to the Missouri State Highway Patrol and pay for the cost of such background checks. The Contractor shall submit to FMDC via email to FMDCSecurity@oa.mo.gov a list of the names of the Contractor's employees who will be fingerprinted and a signed Missouri Applicant Fingerprint Privacy Notice, Authorization For Release Of Information Confidentiality Oath and State Identification Badge Agreement for each employee. All employees of the Contractor approved by FMDC to work at a State facility must obtain a contractor ID badge from FMDC prior to beginning work on-site, unless the Director of FMDC, at the Director's discretion, waives the requirement for a contractor ID badge. The Contractor and its employees must comply with the process for background checks and contractor ID badges found on FMDC's website at: <https://oa.mo.gov/fmdc-contractor-id-badges>.
3. Pursuant to section 43.540, RSMo, FMDC participates in the Missouri Rap Back and National Rap Back programs as of August 28, 2018. This means that the Missouri State Highway Patrol, Central Records Repository, and the Federal Bureau of Investigation will retain the fingerprints submitted by each of the Contractor's employees, and those fingerprints will be searched against other fingerprints on file, including latent fingerprints. While retained, an employee's fingerprints may continue to be compared against other fingerprints submitted or retained by the Federal Bureau of Investigation, including latent fingerprints.
4. As part of the Missouri and National Rap Back programs, FMDC will receive notification if a new arrest is reported for an employee whose fingerprints have been submitted for FMDC after August 28, 2018. If the employee is performing work on a State contract at the time of the arrest notification, FMDC will request and receive the employee's updated criminal history records. If the employee is no longer performing work on a State contract, FMDC will not obtain updated criminal records.
5. Pursuant to section 43.540, RSMo, the Missouri State Highway Patrol will provide the results of the employee's background check directly to FMDC. FMDC may NOT release the results of a background check to the Contractor or provide the Contractor any information obtained from a background check, either verbally or in writing. FMDC will notify the Contractor only whether an employee is approved to work on State property.
6. Each employee who submits fingerprints to the Missouri State Highway Patrol has a right to obtain a copy of the results of his or her background check. The employee may challenge the accuracy and completeness of the information contained in a background check report and obtain a determination from the Missouri State Highway Patrol and/or the FBI regarding the validity of such challenge prior to FMDC making a final decision about his or her eligibility to perform work under a State contract.
7. The Contractor shall notify FMDC via email to FMDCSecurity@oa.mo.gov if an employee is terminated or resigns from employment with the Contractor. If the Contractor does not anticipate performing work on a State contract in the future, the Contractor may request that FMDC remove its employees from the Rap Back programs. However, if removed from the Rap Back programs, employees will be required to submit

- new fingerprints should the contractor be awarded another State contract.
8. Upon award of a Contract, the Contractor should contact FMDC at FMDCSecurity@oa.mo.gov to determine if its employees need to provide a new background check. If a Contractor's employee has previously submitted a fingerprint background check to FMDC as part of the Missouri and National Rap Back programs, the employee may not need to submit another fingerprint search for a period of three to six years, depending upon the circumstances. The Contractor understands and agrees that FMDC may require more frequent background checks without providing any explanation to the Contractor. The fact that an additional background check is requested by FMDC does not indicate that the employee has a criminal record.

3.4 DISRUPTION OF UTILITIES

- A. The Contractor shall give a minimum of seventy-two (72) hours written notice to the Construction Representative and the Facility Representative before disconnecting electric, gas, water, fire protection, or sewer service to any building.
- B. The Contractor shall give a minimum of seventy-two (72) hours written notice to the Construction Representative and Facility Representative before closing any access drives, and shall make temporary access available, if possible. The Contractor shall not obstruct streets, walks, or parking.

3.5 PROTECTION OF PERSONS AND PROPERTY

A. SAFETY PRECAUTIONS AND PROGRAMS

1. The Contractor shall at all times conduct operations under this Contract in a manner to avoid the risk of bodily harm to persons or risk of damage to any property. The Contractor shall promptly take precautions which are necessary and adequate against conditions created during the progress of the Contractor's activities hereunder which involve a risk of bodily harm to persons or a risk of damage to property. The Contractor shall continuously inspect Work, materials, and equipment to discover and determine any such conditions and shall be solely responsible for discovery, determination, and correction of any such conditions. The Contractor shall comply with applicable safety laws, standards, codes, and regulations in the jurisdiction where the Work is being performed, specifically, but without limiting the generality of the foregoing, with rules, regulations, and standards adopted pursuant to the Williams-Steiger Occupational Safety and Health Act of 1970 and applicable amendments.
2. All contractors, subcontractors and workers on this project are subject to the Construction Safety Training provisions 292.675 RSMo.
3. In the event the Contractor encounters on the site, material reasonably believed to be asbestos, polychlorinated biphenyl (PCB), lead, mercury, or other material known to be hazardous, which has not been rendered harmless, the Contractor shall immediately stop Work in the area affected and report the condition to the Owner's Representative and the Architect in writing. The Work in the affected area shall not thereafter be resumed except by written agreement of the Owner's Representative and Contractor if in fact the material is asbestos or polychlorinated biphenyl (PCB) and has not been rendered harmless. The Work in the affected area shall be resumed in the absence of asbestos or polychlorinated biphenyl (PCB), or when it has been rendered harmless by written agreement of the

Owner's Representative and the Contractor. "Rendered Harmless" shall mean that levels of such materials are less than any applicable exposure standards, including but limited to OSHA regulations.

B. SAFETY OF PERSONS AND PROPERTY

1. The Contractor shall take reasonable precautions for safety of, and shall provide protection to prevent damage, injury, or loss to:
 - a. clients, staff, the public, construction personnel, and other persons who may be affected thereby;
 - b. 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 of any tier; and
 - c. other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.
2. The Contractor shall give notices and comply with applicable laws, standards, codes, ordinances, rules, regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury, or loss.
3. The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, safeguards for safety and protection, including, but not limited to, posting danger signs and other warnings against hazards, promulgating safety regulations, and notifying owners and users of adjacent sites and utilities.
4. When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise the highest degree of care and carry on such activities under supervision of properly qualified personnel.
5. The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in this Section caused in whole or in part by the Contractor, a Subcontractor of any tier, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable, and for which the Contractor is responsible under this Section, except damage or loss attributable solely to acts or omissions of Owner or the Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's other obligations stated elsewhere in the Contract.
6. 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 maintaining, enforcing and supervising of safety precautions and programs. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner's Representative and Architect. The Contractor shall hold regularly scheduled safety meetings to instruct Contractor personnel on safety practices, accident avoidance and prevention, and the Project Safety Program. The Contractor shall furnish safety equipment and enforce the use of such equipment by its employees and its subcontractors of any tier.
7. The Contractor shall not load or permit any part of the construction or site to be loaded so as to endanger its safety.
8. The Contractor shall promptly report in writing to the Owner all accidents arising out of

or in connection with the Work which cause death, lost time injury, personal injury, or property damage, giving full details and statements of any witnesses. In addition, if death, serious personal injuries, or serious property damages are caused, the accident shall be reported immediately.

9. The Contractor shall promptly notify in writing to the Owner of any claims for injury or damage to personal property related to the work, either by or against the Contractor.
10. The Owner assumes no responsibility or liability for the physical condition or safety of the Work site or any improvements located on the Work site. The Contractor shall be solely responsible for providing a safe place for the performance of the Work. The Owner shall not be required to make any adjustment in either the Contract Sum or Contract Time concerning any failure by the Contractor or any Subcontractor to comply with the requirements of this Paragraph.
11. In no event shall the Owner have control over, charge of, or any responsibility for construction means, methods, techniques, sequences or procedures or for safety precautions and programs in connection with the Work, notwithstanding any of the rights and authority granted the Owner in the Contract Documents.
12. The Contractor shall maintain at his own cost and expense, adequate, safe and sufficient walkways, platforms, scaffolds, ladders, hoists and all necessary, proper, and adequate equipment, apparatus, and appliances useful in carrying on the Work and which are necessary to make the place of Work safe and free from avoidable danger for clients, staff, the public and construction personnel, and as may be required by safety provisions of applicable laws, ordinances, rules regulations and building and construction codes.

END OF SECTION 013513.28

SECTION 014110 – SPECIAL INSPECTIONS AND TESTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Requirements for Contractor.
 - 2. Requirements for Special Inspector.
- B. Related Sections:
 - 1. Division 03 Section "Cast-in-Place Concrete."
 - 2. Division 05 Section "Structural Steel Framing."

1.2 DEFINITIONS

- A. Building Official: The officer or other designated authority charged with the administration and enforcement of the building code.
- B. Engineer: The registered Professional Engineer who prepared the Statement of Special Inspections.
- C. Intern Engineer: A graduate of an ABET accredited engineering program who has passed the Fundamentals of Engineering (FE) examination from NCEES, and is registered with a state as an Intern Engineer or an Engineer in Training.
- D. Special Inspection Program Manager: The contact individual for the agency that is providing the special inspection services, who manages the reporting requirements.

1.3 QUALITY ASSURANCE

- A. Special inspections and testing shall be provided in accordance with Chapter 17 of the 2018 International Building Code.
- B. The program of Special Inspection and Testing is a Quality Assurance program intended to ensure that the work is performed in accordance with the Contract Documents.
- C. This specification section is intended to inform the Contractor of the Owner's quality assurance program and extent of the Contractor's responsibilities. This specification section is also intended to notify the Special Inspectors, Testing Laboratory, and other Agents of the Special Inspectors of their requirements and responsibilities.
- D. Required inspections and tests are described in the attached Statement of Special Inspections and in the individual specification sections for the items to be inspected or tested.
- E. The services and quantities of testing specified are approximate and may vary. Actual services and quantities of testing will be determined by the Engineer during the construction period.
- F. The Engineer will determine the locations for taking sample specimens for testing in accordance with the specifications.

1.4 QUALIFICATIONS

- A. The Special Inspectors shall be qualified persons hired directly by the Owner who demonstrate competence to the satisfaction of the Engineer and Building Official.

- B. The testing laboratory shall retain the services of a full time registered Professional Engineer who shall certify all test reports, shall be responsible for the training of the testing technicians and shall be in responsible charge of the field and laboratory testing operations.
- C. Special inspections shall be performed by Special Inspectors who are certified as identified below:
 - 1. Inspectors performing sampling and testing of concrete shall be ACI certified Concrete Field Testing Technicians – Grade 1.
 - 2. Inspectors performing inspections of concrete work such as inspections of concrete placement, batching, reinforcing placement, curing and protection, shall be ACI certified Concrete Construction Inspectors or ICC certified Reinforced Concrete Special Inspectors.
 - 3. Inspectors performing inspections of prestressed concrete work shall have ICC Reinforced Concrete Certification or be an ACI Concrete Field Testing Technician with Grade 1 certification plus one year relevant experience.
 - 4. Inspectors performing inspection of welding shall have one of the following certifications:
 - a. AWS Certified Welding Inspector.
 - b. ICC Structural Steel and Welding Certificate plus one year of relevant experience.
 - c. Level II Certification from the American Society for non-destructive Testing (NDT).
 - d. NDT Level III provided previously certified as NDT Level II.
 - 5. Inspectors performing inspections of High-strength Bolting and Steel Frame Inspection shall have ICC Structural Steel and Welding certification and one year of relevant experience.
 - 6. Inspectors performing inspections of excavation and filling; verification of soils; piling and drilled piers; and modular retaining walls shall have a National Institute for Certification in Engineering Technologies (NICET) Level II certification in geotechnical engineering technology/construction.
 - 7. Inspectors performing inspections of spray fireproofing shall have ICC Spray-Applied Fireproofing certification and one year of relevant experience.
 - 8. Special Inspection of smoke control systems shall be agencies which have expertise in fire protection engineering, mechanical engineering and certification as air balancers.
 - 9. Technicians performing standard tests described by specific ASTM Standards shall have training in the performance of such tests and must be able to demonstrate either by oral or written examination competence for the test to be conducted. They shall be under the supervision of a licensed Professional Engineer and shall not be permitted to independently evaluate test results.
 - 10. An Intern Engineer with relevant experience, or a Registered Professional Engineer with relevant experience, is considered qualified to perform any of the inspections identified in the Special Inspection program, with the exception of Welding and Smoke Control Systems.

1.5 SUBMITTALS

- A. The Special Inspectors and Testing Laboratories shall submit to the Engineer and Building Official for review a copy of their qualifications which shall include the names and qualifications of each of the individual inspectors and technicians who will be performing inspections or tests.
- B. The Special Inspectors and Testing Laboratories shall disclose any past or present business relationship or potential conflict of interest with the Contractor or any of the Subcontractors whose work will be inspected or tested.

1.6 PAYMENT

- A. The Owner will engage, at his own expense, the services of the Special Inspectors and Testing Laboratories.
- B. If any materials which require Special Inspections are fabricated in a plant which is not located within 100 miles of the project, the Contractor is responsible for the travel expenses of the Special Inspectors or Testing Laboratories.
- C. The cost of any retesting or reinspection of work which fails to comply with the requirements of the Contract Documents is the responsibility of the Contractor.

1.7 CONTRACTOR RESPONSIBILITIES

- A. Cooperate with the Special Inspectors and Testing Laboratories so that the Special Inspections and testing may be performed without hindrance.
- B. Review the Statement of Special Inspections and be responsible for coordinating and scheduling inspections and tests. Notify the Special Inspectors or Testing Laboratories at least 24 hours in advance of a required inspection or test. Uninspected work that required inspection may be rejected solely on failure of notification.
- C. Provide incidental labor and facilities to provide safe access to the work to be inspected or tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
 - 1. Construct a storage box on site of sufficient size to store concrete cylinders which will afford protection as required by ASTM C-31.
 - 2. Provide the laboratory with representative initial samples, in requested quantities.
 - 3. When source, quality or characteristic of an approved material changes or indicates lack of compliance with Contract requirements, submit additional samples of materials to testing laboratory.
 - 4. Patch area where samples are taken for purposes of testing to the satisfaction of the Architect.
- D. Retain the latest set of construction drawings, field sketches, approved shop drawings, and specifications at the project site for use by the inspectors and testing technicians.
- E. The Special Inspection program does not, in any way, relieve the Contractor of his obligation to perform work in accordance with the requirements of the Contract Documents or from implementing an effective Quality Control program. All work that is to be subjected to Special Inspections shall first be reviewed by the Contractor's quality control personnel.
- F. The sole responsibility for construction site safety belongs to the Contractor.

1.8 LIMITS ON AUTHORITY

- A. The Special Inspectors or Testing Laboratories may not release, revoke, alter, or enlarge on the requirements of the Contract Documents.
- B. The Special Inspectors or Testing Laboratories will not have control over the Contractor's means and methods of construction.
- C. The Special Inspectors or Testing Laboratories are not responsible for construction site safety.
- D. The Special Inspectors or Testing Laboratories have no authority to stop the work.

1.9 STATEMENT OF SPECIAL INSPECTIONS

- A. The Engineer will prepare the Statement of Special Inspections using the form attached to this Section.
- B. Submit the Statement of Special Inspections with the application for Building Permit.

1.10 RECORDS AND REPORTS

- A. Submit daily reports of each inspection or test to the Special Inspection Program Manager. Reports shall include:
 - 1. Date of test or inspection.
 - 2. Name of inspector or technician.
 - 3. Location of specific areas tested or inspected.
 - 4. Description of test or inspection and results.
 - 5. Applicable ASTM standard.
 - 6. Weather conditions.
 - 7. Signature of special inspector or technician.
- B. The Special Inspection Program Manager shall submit interim reports to the Building Official bi-weekly, which include all inspections and test reports received that week. Provide copies to the Engineer, Architect, and Contractor.
- C. Any discrepancies from the Contract Documents found during a Special Inspection shall be immediately reported to the Contractor. If the discrepancies are not brought into compliance with the Contract Documents, the Special Inspector shall notify the Engineer and Building Official. Reports shall document all discrepancies identified and the corrected action taken.
- D. The Testing Laboratory shall immediately notify the Engineer by telephone or email of any test results that fail to comply with the requirements of the Contract Documents.
- E. Reports shall be submitted to the Engineer within seven (7) days of the inspection or test. Handwritten reports may be submitted if final typed copies are not available.
- F. Provide a statement to the Engineer at the completion of the work requiring Special Inspections from each inspection agency and testing laboratory that all work was completed in substantial conformance with the Contract Documents and that all appropriate inspections and tests were performed.

1.11 FINAL REPORT OF SPECIAL INSPECTIONS

- A. Complete Final Report of Special Inspections by the Special Inspection Program Manager and submit to the Engineer and Building Official prior to the issuance of a Certificate of Use and Occupancy.
- B. Use C.A.S.E. Form 101 – 2004 for the Final Report of Special Inspections
- C. The Final Report of Special Inspections will certify that all required inspections have been performed and will itemize any discrepancies that were not corrected or resolved.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION 014110.0

STATEMENT OF SPECIAL INSPECTIONS

Project: Saint Louis Veteran's Home Renovation
Location: Saint Louis, Missouri
Owner: State of Missouri Office of Administration
Division of Facilities Management, Design and Construction
Architect of Record: CannonDesign
Structural Engineer of Record: CannonDesign

This *Statement of Special Inspections* is submitted as a condition for permit issuance in accordance with the Special Inspection requirements of the 2018 International Building Code. It includes a Schedule of Special Inspection Services applicable to this project as well as the name of the Special Inspectors intended to be retained for conducting these inspections.

The Special Inspectors shall keep records of all inspections and shall furnish inspection reports to the Building Official, Owner, Structural Engineer, and Architect of Record. Discovered discrepancies shall be brought to the immediate attention of the Contractor for correction. If such discrepancies are not corrected, the discrepancies shall be brought to the attention of the Building Official, Structural Engineer, and Architect of Record. The Special Inspection program does not relieve the Contractor of his or her responsibilities.

Interim reports shall be submitted to the Building Official, Owner, Structural Engineer, and Architect of Record.

A *Final Report of Special Inspections* documenting completion of all required Special Inspections and correction of any discrepancies noted in the inspections shall be submitted prior to issuance of a Certificate of Use and Occupancy.

Job site safety and means and methods of construction are solely the responsibility of the Contractor.

Interim Report Frequency: Biweekly

Prepared by:

Design Professional Seal

Signature

Date

Owner's Authorization:

Building Official's Acceptance:

Signature

Date

Signature

Date

The following sheets comprise the required schedule of special inspections for this project. The types of construction that require special inspections for this project are as follows:

Soils
 Cast-in-Place Concrete
 Wood Construction
 Structural Steel

Inspection Agents	Firm	Address
1. Special Inspector		
2. Testing Laboratory		
3. Testing Laboratory		
4. Other		

Note: The qualifications of all personnel performing Special Inspection activities are subject to the approval of the Building Official.

The inspection and testing agent shall be engaged by the Owner or by the Registered Design Professional acting as the Owner's Agent, and not by the Contractor or Subcontractor whose work is to be inspected or tested. Any conflict of interest must be disclosed to the Building Official prior to commencing work.

The credentials of all Inspectors and testing technicians shall be provided if requested.

It is recommended that the person administering the Special Inspections program be a Professional Engineer experienced in the design of buildings.

Key for Minimum Qualifications of Inspection Agents (where indicated on Schedules)	
PE	Professional Engineer
IE	Intern Engineer
ACI	American Concrete Institute Certified Concrete Field Testing Technician
AWS	American Welding Society Certified Welding Inspector
ASNT	American Society of Non-Destructive Testing - Level II or III
ICC	International Code Council Certification
NICET	National Institute for Certification in Engineering Technologies Certification

Qualifications of inspection agents may be indicated on the Schedule in instances where the Structural Engineer deems such requirements are appropriate.

REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS					
VERIFICATION AND INSPECTION		FREQUENCY OF INSPECTION	REFERENCED STANDARD OR SPECIFICATION SECTION	IBC REFERENCE	AGENT
Soils Inspections:				§1705.6	
1.	Verify materials below shallow foundations are adequate to achieve the design bearing capacity.	Periodic			
2.	Verify excavations are extended to the proper depth and have reached proper material.	Periodic			
3.	Perform classification and testing of compacted fill materials.	Periodic			
4.	Verify use of proper materials, densities and lift thickness during placement and compaction of compacted fill.	Continuous			
5.	Prior to placement of compacted fill, observe subgrade and verify that site has been properly prepared.	Periodic			

REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION					
VERIFICATION AND INSPECTION		FREQUENCY OF INSPECTION	REFERENCED STANDARD OR SPECIFICATION SECTION	IBC REFERENCE	AGENT
1.	Inspect reinforcement and verify placement.	Periodic	ACI 318: 20, 25.2, 25.3, 26.6.1-26.6.3	§1908.4	
2.	Inspect anchors cast in concrete.	Periodic	ACI 318; 17.8.2		
3.	Inspect anchors post-installed in hardened concrete members.				
	a. Adhesive anchors installed in horizontally or upwardly inclined orientations to resist sustained tension loads.	Continuous	ACI 318: 17.8.2.4		
	b. Mechanical anchors and adhesive anchors not defined in 4a.	Periodic	ACI 318: 17.8.2		

REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION					
VERIFICATION AND INSPECTION		FREQUENCY OF INSPECTION	REFERENCED STANDARD OR SPECIFICATION SECTION	IBC REFERENCE	AGENT
4.	Verify use of required design mix.	Periodic	ACI 318: 19, 26.4.3, 26.4.4	§1904.1 §1904.2 §1908.2 §1908.3	
5.	Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	Continuous	ASTM C 172 ASTM C 31 ACI 318: 26.5, 26.12	§1908.10	
6.	Inspect concrete and shotcrete placement for proper application techniques.	Continuous	ACI 318: 26.5	§1908.6 §1908.7 §1908.8	
7.	Verify maintenance of specified curing temperature and techniques.	Periodic	ACI 318:26.5.3-26.5.5	§1908.9	
8.	Inspect formwork for shape, location and dimensions of the concrete member being formed.	Periodic	ACI 318: 26.11.2 (b)		

Minimum Qualifications for Special Inspector (Agent):

1. Current ICC Reinforced Concrete Special Inspector or ACI Concrete Construction Inspector.
2. Concrete field testing can be performed by an ACI Concrete Field Testing Technician with Grade 1 certification.
3. Intern Engineer with relevant experience.
4. Professional Engineer with relevant experience.

REQUIRED SPECIAL INSPECTIONS AND TESTS OF STRUCTURAL STEEL CONSTRUCTION					
VERIFICATION AND INSPECTION		FREQUENCY OF INSPECTION	REFERENCED STANDARD OR SPECIFICATION SECTION	IBC REFERENCE	AGENT
1.	Review material test reports and certifications.	Continuous		§1705.2	
2.	Prior to Welding:			§1705.2	
a.	Verify welding procedure specifications are available.	Continuous	AISC 360 Table N5.4-1		
b.	Verify manufacturer certifications for welding consumables are available.	Continuous	AISC 360 Table N5.4-1		
c.	Verify material type and grade.	Periodic	AISC 360 Table N5.4-1		
d.	Verify welder identification system.	Periodic	AISC 360 Table N5.4-1		
e.	Inspect fit-up of groove welds including joint preparation, dimensions, cleanliness, tacking and backing type and fit.	Periodic	AISC 360 Table N5.4-1		
f.	Inspect configuration and finish of access holes.	Periodic	AISC 360 Table N5.4-1		
g.	Inspect fit-up of fillet walls including dimensions, cleanliness, and tacking.	Periodic	AISC 360 Table N5.4-1		
3.	During Welding:			§1705.2	
a.	Verify use of qualified welders.	Periodic	AISC 360 Table N5.4.2		
b.	Verify control and handling of welding consumables including packaging.	Periodic	AISC 360 Table N5.4.2		
c.	Verify welding is not occurring over cracked tack welds.	Periodic	AISC 360 Table N5.4.2		
d.	Record environmental conditions including precipitation and temperature. Verify wind speed is within limits.	Periodic	AISC 360 Table N5.4.2		
e.	Verify that Welding Procedure Specifications are followed including settings on welding equipment, travel speed, selected welding materials, shielding gas type and flow rate, preheat applied, interpass temperature maintained, and proper position.	Periodic	AISC 360 Table N5.4.2		

REQUIRED SPECIAL INSPECTIONS AND TESTS OF STRUCTURAL STEEL CONSTRUCTION						
VERIFICATION AND INSPECTION			FREQUENCY OF INSPECTION	REFERENCED STANDARD OR SPECIFICATION SECTION	IBC REFERENCE	AGENT
	f.	Verify welding techniques including interpass and final cleaning, each pass within profile limitations, and each pass meets quality requirements.	Periodic	AISC 360 Table N5.4.2		
4.	After Welding:				§1705.2	
	a.	Inspect cleaning of welds.	Periodic	AISC 360 Table N5.4-3		
	b.	Verify size, length, and location of welds.	Continuous	AISC 360 Table N5.4-3		
	c.	Verify welds meet visual acceptance criteria including crack prohibition, weld/base-metal fusion, crater cross section, weld profiles, weld size, undercut and porosity.	Continuous	AISC 360 Table N5.4-3		
	d.	Inspect arc strikes.	Continuous	AISC 360 Table N5.4-3		
	e.	When welding has been performed in the k-area, visually inspect for cracks within 3 inches of the weld.	Continuous	AISC 360 Table N5.4-3		
	f.	Verify backing and welds tabs are removed.	Continuous	AISC 360 Table N5.4-3		
	g.	Inspect repair activities.	Continuous	AISC 360 Table N5.4-3		
	h.	Document acceptance or rejection of welded joint or member.	Continuous	AISC 360 Table N5.4-3		
5.	Prior to Bolting:				§1705.2	
	a.	Verify manufacturer’s certifications for fastener materials.	Continuous	AISC 360 Table N5.6-1		
	b.	Verify fasteners are marked in accordance with ASTM requirements.	Periodic	AISC 360 Table N5.6-1		
	c.	Verify proper fasteners including grade, type, bolt length and if treads are to be excluded from shear plane.	Periodic	AISC 360 Table N5.6-1		
	d.	Verify proper bolting procedures are used.	Periodic	AISC 360 Table N5.6-1		

REQUIRED SPECIAL INSPECTIONS AND TESTS OF STRUCTURAL STEEL CONSTRUCTION					
VERIFICATION AND INSPECTION		FREQUENCY OF INSPECTION	REFERENCED STANDARD OR SPECIFICATION SECTION	IBC REFERENCE	AGENT
e.	Verify connection elements, including the appropriate faying surface condition and hole preparation meet requirements.	Periodic	AISC 360 Table N5.6-1		
f.	Observe and document Preinstallation verification testing for fastener assemblies.	Periodic	AISC 360 Table N5.6-1		
g.	Verify proper storage of bolts, nuts, washers and other fastener components.	Periodic	AISC 360 Table N5.6-1		
6.	During Bolting:			§1705.2	
a.	Verify position of fastener assemblies.	Periodic	AISC 360 Table N5.6-2		
b.	Verify joints are brought to the snug-tight condition prior to the pretensioning operation.	Periodic	AISC 360 Table N5.6-2		
c.	Verify fastener component not turned by the wrench is prevented from rotating.	Periodic	AISC 360 Table N5.6-2		
d.	Verify fasteners are pretensioned in accordance with the RCSD Specification.	Periodic	AISC 360 Table N5.6-2		
7.	After Bolting:			§1705.2	
a.	Document acceptance or rejection of bolted connections.	Continuous	AISC 360 Table N5.6-3		

REQUIRED SPECIAL INSPECTIONS AND TESTS OF WOOD CONSTRUCTION					
VERIFICATION AND INSPECTION		FREQUENCY OF INSPECTION	REFERENCED STANDARD OR SPECIFICATION SECTION	IBC REFERENCE	AGENT
1.	Fabrication process of prefabricated wood structural elements and assemblies unless fabricator is an approved facility.	Periodic		§1705.5	

2.	Metal-plate-connected wood trusses spanning 60 feet or greater.			§1705.5.2	
a.	Verify temporary installation restraint/bracing.	Periodic			
b.	Verify permanent individual truss member restraint/bracing installation.	Periodic			

REFERENCES:

1. ACI 318-14, *Building Code Requirements for Structural Concrete*
2. AISC 360-16, *Specification for Structural Steel Buildings*
3. ASTM A6 – 14, *Specification for General Requirements for Rolled Steel, Structural Steel Bars, Plates, Shapes, and Sheet Piling*
4. ASTM A 36 - 14, *Specification for Carbon Structural Steel*
5. RCSC - 14, *Specification for Structural Joints Using ASTM A325 or A490 Bolts*
6. AWS D1.1 – 15, *Structural Welding Code – Steel*

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.
- J. "Contract Limit": Space available for performing construction activities; the primary area of Work may be indicated by a Limit of Construction line on Drawings, but Work necessary to complete the Project can also occur beyond this limit. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.
- K. "Remove": Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- L. "Remove and Salvage": Detach items from existing construction and deliver them to Owner ready for reuse.

- M. "Salvage": Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse. Include fasteners or brackets needed for reattachment elsewhere.
- N. "Remove and Reinstall": Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- O. "Existing to Remain": Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.
- P. "Demolish": Tearing down, destruction, breakup, razing or removal of the whole or part of a building or structure, or a free standing machinery or equipment that is directly related to the function of the structure.
- Q. "Recycle": Recovery of demolition waste for subsequent processing in preparation for reuse.
- R. Permanent Enclosure: As determined by Architect, the condition at which roofing is insulated and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures equivalent in weather protection to permanent construction.

1.2 INDUSTRY STANDARDS

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

1.3 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.
 - 1. AABC - Associated Air Balance Council; www.aabc.com.
 - 2. AAMA - American Architectural Manufacturers Association; www.aamanet.org.

3. AAPFCO - Association of American Plant Food Control Officials; www.aapfco.org.
4. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
5. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
6. ABMA - American Bearing Manufacturers Association; www.americanbearings.org.
7. ABMA - American Boiler Manufacturers Association; www.abma.com.
8. ACI - American Concrete Institute; (Formerly: ACI International); www.abma.com.
9. ACPA - American Concrete Pipe Association; www.concrete-pipe.org.
10. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
11. AF&PA - American Forest & Paper Association; www.afandpa.org.
12. AGA - American Gas Association; www.aga.org.
13. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
14. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
15. AI - Asphalt Institute; www.asphaltinstitute.org.
16. AIA - American Institute of Architects (The); www.aia.org.
17. AISC - American Institute of Steel Construction; www.aisc.org.
18. AISI - American Iron and Steel Institute; www.steel.org.
19. AITC - American Institute of Timber Construction; www.aitc-glulam.org.
20. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
21. ANSI - American National Standards Institute; www.ansi.org.
22. AOSA - Association of Official Seed Analysts, Inc.; www.aosaseed.com.
23. APA - APA - The Engineered Wood Association; www.apawood.org.
24. APA - Architectural Precast Association; www.archprecast.org.
25. API - American Petroleum Institute; www.api.org.
26. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
27. ARI - American Refrigeration Institute; (See AHRI).
28. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
29. ASCE - American Society of Civil Engineers; www.asce.org.
30. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
31. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.

32. ASME - ASME International; (American Society of Mechanical Engineers); www.asme.org.
33. ASSE - American Society of Safety Engineers (The); www.asse.org.
34. ASSE - American Society of Sanitary Engineering; www.asse-plumbing.org.
35. ASTM - ASTM International; www.astm.org.
36. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
37. AWEA - American Wind Energy Association; www.awea.org.
38. AWI - Architectural Woodwork Institute; www.awinet.org.
39. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.
40. AWPA - American Wood Protection Association; www.awpa.com.
41. AWS - American Welding Society; www.aws.org.
42. AWWA - American Water Works Association; www.awwa.org.
43. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
44. BIA - Brick Industry Association (The); www.gobrick.com.
45. BICSI - BICSI, Inc.; www.bicsi.org.
46. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.org.
47. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
48. BWF - Badminton World Federation; (Formerly: International Badminton Federation); www.bissc.org.
49. CDA - Copper Development Association; www.copper.org.
50. CEA - Canadian Electricity Association; www.electricity.ca.
51. CEA - Consumer Electronics Association; www.ce.org.
52. CFFA - Chemical Fabrics and Film Association, Inc.; www.chemicalfabricsandfilm.com.
53. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
54. CGA - Compressed Gas Association; www.cganet.com.
55. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
56. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
57. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
58. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
59. CPA - Composite Panel Association; www.pbmdf.com.

60. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
61. CRRC - Cool Roof Rating Council; www.coolroofs.org.
62. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
63. CSA - Canadian Standards Association; www.csa.ca.
64. CSA - CSA International; (Formerly: IAS - International Approval Services); www.csa-international.org.
65. CSI - Construction Specifications Institute (The); www.csinet.org.
66. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
67. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); www.cti.org.
68. CWC - Composite Wood Council; (See CPA).
69. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
70. DHI - Door and Hardware Institute; www.dhi.org.
71. ECA - Electronic Components Association; (See ECIA).
72. ECAMA - Electronic Components Assemblies & Materials Association; (See ECIA).
73. ECIA - Electronic Components Industry Association; www.eciaonline.org.
74. EIA - Electronic Industries Alliance; (See TIA).
75. EIMA - EIFS Industry Members Association; www.eima.com.
76. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
77. ESD - ESD Association; (Electrostatic Discharge Association); www.esda.org.
78. ESTA - Entertainment Services and Technology Association; (See PLASA).
79. EVO - Efficiency Valuation Organization; www.evo-world.org.
80. FCI - Fluid Controls Institute; www.fluidcontrolsintstitute.org.
81. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); www.fiba.com.
82. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); www.fivb.org.
83. FM Approvals - FM Approvals LLC; www.fmglobal.com.
84. FM Global - FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
85. FRSA - Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.; www.floridarooft.com.
86. FSA - Fluid Sealing Association; www.fluidsealing.com.
87. FSC - Forest Stewardship Council U.S.; www.fscus.org.

88. GA - Gypsum Association; www.gypsum.org.
89. GANA - Glass Association of North America; www.glasswebsite.com.
90. GS - Green Seal; www.greenseal.org.
91. HI - Hydraulic Institute; www.pumps.org.
92. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
93. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
94. HPVA - Hardwood Plywood & Veneer Association; www.hpva.org.
95. HPW - H. P. White Laboratory, Inc.; www.hpwhite.com.
96. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
97. IAS - International Accreditation Service; www.iasonline.org.
98. IAS - International Approval Services; (See CSA).
99. ICBO - International Conference of Building Officials; (See ICC).
100. ICC - International Code Council; www.iccsafe.org.
101. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
102. ICPA - International Cast Polymer Alliance; www.icpa-hq.org.
103. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
104. IEC - International Electrotechnical Commission; <http://www.iec.ch>.
105. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
106. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); www.ies.org.
107. IESNA - Illuminating Engineering Society of North America; (See IES).
108. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
109. IGMA - Insulating Glass Manufacturers Alliance; www.igmaonline.org.
110. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.okstate.edu.
111. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
112. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
113. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); www.isa.org.
114. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).
115. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); www.isfanow.org.

116. ISO - International Organization for Standardization; www.iso.org.
117. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
118. ITU - International Telecommunication Union; www.itu.int/home.
119. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
120. LMA - Laminating Materials Association; (See CPA).
121. LPI - Lightning Protection Institute; www.lightning.org.
122. MBMA - Metal Building Manufacturers Association; www.mbma.com.
123. MCA - Metal Construction Association; www.metalconstruction.org.
124. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
125. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
126. MHIA - Material Handling Industry of America; www.mhia.org.
127. MIA - Marble Institute of America; www.marble-institute.com.
128. MMPA - Moulding & Millwork Producers Association; www.wmmpa.com.
129. MPI - Master Painters Institute; www.paintinfo.com.
130. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.
131. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
132. NACE - NACE International; (National Association of Corrosion Engineers International); www.nace.org.
133. NADCA - National Air Duct Cleaners Association; www.nadca.com.
134. NAIMA - North American Insulation Manufacturers Association; www.naima.org.
135. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
136. NBI - New Buildings Institute; www.newbuildings.org.
137. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
138. NCMA - National Concrete Masonry Association; www.ncma.org.
139. NEBB - National Environmental Balancing Bureau; www.nebb.org.
140. NECA - National Electrical Contractors Association; www.necanet.org.
141. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
142. NEMA - National Electrical Manufacturers Association; www.nema.org.
143. NETA - InterNational Electrical Testing Association; www.netaworld.org.
144. NFHS - National Federation of State High School Associations; www.nfhs.org.

145. NFPA - National Fire Protection Association; www.nfpa.org.
146. NFPA - NFPA International; (See NFPA).
147. NFRC - National Fenestration Rating Council; www.nfrc.org.
148. NHLA - National Hardwood Lumber Association; www.nhla.com.
149. NLGA - National Lumber Grades Authority; www.nlga.org.
150. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
151. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
152. NRCA - National Roofing Contractors Association; www.nrca.net.
153. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
154. NSF - NSF International; www.nsf.org.
155. NSPE - National Society of Professional Engineers; www.nspe.org.
156. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
157. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
158. NWFA - National Wood Flooring Association; www.nwfa.org.
159. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
160. PDI - Plumbing & Drainage Institute; www.pdionline.org.
161. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); www.plasa.org.
162. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
163. RFCI - Resilient Floor Covering Institute; www.rfci.com.
164. RIS - Redwood Inspection Service; www.redwoodinspection.com.
165. SAE - SAE International; www.sae.org.
166. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
167. SDI - Steel Deck Institute; www.sdi.org.
168. SDI - Steel Door Institute; www.steeldoor.org.
169. SEFA - Scientific Equipment and Furniture Association (The); www.sefalabs.com.
170. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
171. SIA - Security Industry Association; www.siaonline.org.
172. SJI - Steel Joist Institute; www.steeljoist.org.
173. SMA - Screen Manufacturers Association; www.smainfo.org.

174. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
175. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
176. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
177. SPIB - Southern Pine Inspection Bureau; www.spib.org.
178. SPRI - Single Ply Roofing Industry; www.spri.org.
179. SRCC - Solar Rating & Certification Corporation; www.solar-rating.org.
180. SSINA - Specialty Steel Industry of North America; www.ssina.com.
181. SSPC - SSPC: The Society for Protective Coatings; www.sspc.org.
182. STI - Steel Tank Institute; www.steeltank.com.
183. SWI - Steel Window Institute; www.steelwindows.com.
184. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
185. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
186. TCNA - Tile Council of North America, Inc.; www.tileusa.com.
187. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.
188. TIA - Telecommunications Industry Association (The); (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.
189. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
190. TMS - The Masonry Society; www.masonrysociety.org.
191. TPI - Truss Plate Institute; www.tpinst.org.
192. TPI - Turfgrass Producers International; www.turfgrassod.org.
193. TRI - Tile Roofing Institute; www.tileroofing.org.
194. UL - Underwriters Laboratories Inc.; www.ul.com.
195. UNI - Uni-Bell PVC Pipe Association; www.uni-bell.org.
196. USAV - USA Volleyball; www.usavolleyball.org.
197. USGBC - U.S. Green Building Council; www.usgbc.org.
198. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
199. WASTEC - Waste Equipment Technology Association; www.wastec.org.
200. WCLIB - West Coast Lumber Inspection Bureau; www.wclib.org.
201. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.

202. WDMA - Window & Door Manufacturers Association; www.wdma.com.
 203. WI - Woodwork Institute; www.wicnet.org.
 204. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.
 205. WWPA - Western Wood Products Association; www.wwpa.org.
- B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.
1. DIN - Deutsches Institut für Normung e.V.; www.din.de.
 2. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
 3. ICC - International Code Council; www.iccsafe.org.
 4. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.
- C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.
1. COE - Army Corps of Engineers; www.usace.army.mil.
 2. CPSC - Consumer Product Safety Commission; www.cpsc.gov.
 3. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
 4. DOD - Department of Defense; www.quicksearch.dla.mil.
 5. DOE - Department of Energy; www.energy.gov.
 6. EPA - Environmental Protection Agency; www.epa.gov.
 7. FAA - Federal Aviation Administration; www.faa.gov.
 8. FG - Federal Government Publications; www.gpo.gov/fdsys.
 9. GSA - General Services Administration; www.gsa.gov.
 10. HUD - Department of Housing and Urban Development; www.hud.gov.
 11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; www.eetd.lbl.gov.
 12. OSHA - Occupational Safety & Health Administration; www.osha.gov.
 13. SD - Department of State; www.state.gov.
 14. TRB - Transportation Research Board; National Cooperative Highway Research Program; The National Academies; www.trb.org.

15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
 16. USDA - Department of Agriculture; Rural Utilities Service; www.usda.gov.
 17. USDOJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.
 18. USP - U.S. Pharmacopeial Convention; www.usp.org.
 19. USPS - United States Postal Service; www.usps.com.
- D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.
1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.gpo.gov/fdsys.
 2. DOD - Department of Defense; Military Specifications and Standards; Available from DLA Document Services; www.quicksearch.dla.mil.
 3. DSCC - Defense Supply Center Columbus; (See FS).
 4. FED-STD - Federal Standard; (See FS).
 5. FS - Federal Specification; Available from DLA Document Services; www.quicksearch.dla.mil.
 - a. Available from Defense Standardization Program; www.dsp.dla.mil.
 - b. Available from General Services Administration; www.gsa.gov.
 - c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org/ccb.
 6. MILSPEC - Military Specification and Standards; (See DOD).
 7. USAB - United States Access Board; www.access-board.gov.
 8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).
- E. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.
1. CBHF; State of California; Department of Consumer Affairs; Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation; www.bearhfti.ca.gov.
 2. CCR; California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; www.calregs.com.

St. Louis Veteran's Home Renovation
St. Louis, MO
State Project No. U2307-01
CannonDesign Project No. 005680.00

June 26, 2025
Issued for Bid

3. CDHS; California Department of Health Services; (See CDPH).
4. CDPH; California Department of Public Health; Indoor Air Quality Program;
www.cal-iaq.org.
5. CPUC; California Public Utilities Commission; www.cpuc.ca.gov.
6. SCAQMD; South Coast Air Quality Management District; www.aqmd.gov.
7. TFS; Texas A&M Forest Service; Sustainable Forestry and Economic Development;
www.txforestservation.tamu.edu.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 015000 – CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes requirements for construction facilities and temporary controls including temporary utilities, support facilities, security, and protection.
- B. Temporary utilities include, but are not limited to, the following:
 - 1. Water service and distribution
 - 2. Temporary electric power and light
 - 3. Temporary heat
 - 4. Ventilation
 - 5. Telephone service
 - 6. Sanitary facilities, including drinking water
 - 7. Storm and sanitary sewer
- C. Support facilities include, but are not limited to, the following:
 - 1. Field offices and storage sheds
 - 2. Dewatering facilities and drains
 - 3. Temporary enclosures
 - 4. Temporary project identification signs and bulletin boards
 - 5. Waste disposal services
 - 6. Rodent and pest control
 - 7. Construction aids and miscellaneous services and facilities
- D. Security and protection facilities include, but are not limited to, the following:
 - 1. Temporary fire protection
 - 2. Barricades, warning signs, and lights
 - 3. Environmental protection

1.3 QUALITY ASSURANCE

- A. Regulations: Comply with industry standards and applicable laws and regulations including, but not limited to, the following:
 - 1. Building code requirements
 - 2. Health and safety regulations
 - 3. Utility company regulations
 - 4. Police, fire department, and rescue squad rules
 - 5. Environmental protection regulations
- B. Standards: Comply with NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations". ANSI A10 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library "Temporary Electrical Facilities".
 - 1. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70 "National Electric Code".
- C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.4 PROJECT CONDITIONS

- A. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the Work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire-prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist onsite.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide new materials. If acceptable to the Designer, the Contractor may use undamaged, previously used materials in serviceable condition. Provide materials suitable for use intended.
- B. Lumber and Plywood: Comply with requirements in Division 6 Section "Rough Carpentry".
 - 1. For job-built temporary office, shops, and sheds within the construction area, provide UL-labeled, fire-treated lumber and plywood for framing, sheathing, and siding.
 - 2. For signs and directory boards, provide exterior-type, Grade B-B high-density concrete form overlay plywood of sized and thicknesses indicated.

3. For fences and vision barriers, provide minimum 3/9" (9.5mm) thick exterior plywood.
 4. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8" (16mm) thick exterior plywood.
- C. Gypsum Wallboard: Provide gypsum wallboard on interior walls of temporary offices.
- D. Paint: Comply with requirements of Division 9 Section "Painting".
1. For job-built temporary offices, shops, sheds, fences, and other exposed lumber and plywood, provide exterior-grade acrylic-latex emulsion over exterior primer.
 2. For sign panels and applying graphics, provide exterior-grade alkyd gloss enamel over exterior primer.
 3. For interior walls of temporary offices, provide two (2) quarts interior latex-flat wall paint.
- E. Tarpaulins: Provide waterproof, fire-resistant, UL-labeled tarpaulins with flame-spread rating of (15) or less. For temporary enclosures, provide translucent, nylon-reinforced laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.
- F. Water: Provide potable water approved by local health authorities.

2.2 EQUIPMENT

- A. General: Provide new equipment. If acceptable to the Designer, the Contractor may use undamaged, previously used equipment in serviceable condition. Provide equipment suitable for use intended.
- B. Water Hoses: Provide 3/4" (19mm), heavy-duty, abrasion-resistant, flexible rubber hoses 100' (30m) long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.
- C. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110 to 120V plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.
- D. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage rating.
- E. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered-glass enclosures where exposed to breakage. Provide exterior fixture where exposed to moisture.
- F. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM, or another recognized trade association related to the type of fuel being consumed.

- G. Temporary Offices: Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows, and serviceable finishes. Provide heated and air-conditioned units on foundations adequate for normal loading.
- H. Temporary Toilet Units: Provide self-contained, single-occupant toilet units of the chemical, aerated re-circulation, or combustion type. Provide units properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
- I. Fire Extinguishers: Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers, or a combination of extinguishers of NFPA-recommended classes for the exposures.
 - 1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. Provide each Facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. Temporary Water Service: The Owner will provide water for construction purposes from the existing building system. All required temporary extensions shall be provided and removed by the Contractor. Connection points and methods of connection shall be designated and approved by the Construction Representative.
- B. Temporary Electric Power Service: The Owner will provide electric power for construction lighting and power tools. Contractors using such services shall pay all costs of temporary services, circuits, outlet, extensions, etc.
- C. Temporary Lighting: When overhead floor or roof deck has been installed, provide temporary lighting with local switching.
 - 1. Install and operate temporary lighting that will fulfill security and protection requirements without operating the entire system. Provide temporary lighting that will provide adequate illumination for construction operations and traffic conditions.
- D. Temporary Heating: Provide temporary heat required by construction activities for curing or drying of completed installations or for protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not

have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.

1. Heating Facilities: Except where the Owner authorizes use of the permanent system, provide vented, self-contained, LP gas or fuel-oil heaters with individual space thermostatic control.
 2. Use of gasoline-burning space heaters, open flame, or salamander heating units is prohibited.
- E. Temporary Heating and Cooling: The normal heating and/or cooling system of the building shall be maintained in operation during the construction. Should the Contractor find it necessary to interrupt the normal HVAC service to spaces, which have not been vacated for construction, such interruptions shall be pre-scheduled with the Construction Representative.
- F. Temporary Telephones: Provide temporary telephone service throughout the construction period for all personnel engaged in construction activities.
1. At each telephone, post a list of important telephone numbers.
- G. Temporary Toilets: Install self-contained toilet units. Use of pit-type privies will not be permitted. Comply with regulations and health codes for the type, number, location, operation, and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.
1. Shield toilets to ensure privacy.
 2. Provide separate facilities for male and female personnel.
 3. Provide toilet tissue materials for each facility.
- H. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a health and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.
1. Provide paper towels or similar disposable materials for each facility.
 2. Provide covered waste containers for used material.
 3. Provide safety showers, eyewash fountains, and similar facilities for convenience, safety, and sanitation of personnel.
- I. Drinking-Water Facilities: Provide containerized, tap-dispenser, bottled-water drinking-water units, including paper supply.
1. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45°F to 55°F (7°C to 13°C).

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Locate field offices, storage sheds, and other temporary construction and support facilities for easy access.

1. Maintain support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.
- B. Field Offices: Provide insulated, weathertight temporary offices of sufficient size to accommodate required office personnel at the Project site. Keep the office clean and orderly for use for small progress meetings. Furnish and equip office as follows:
 1. Furnish with a desk and chairs, a 4-drawer file cabinet, plan table, plan rack, and a 6-shelf bookcase.
 2. Equip with a water cooler and private toilet complete with water closet, lavatory, and medicine cabinet unit with a mirror.
- C. Storage facilities: Install storage sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters or fully enclosed spaces within the building or elsewhere onsite.
- D. Construction Parking: Parking at the site will be provided in the areas designated at the Pre-Construction Meeting.
- E. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities.
 1. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and materials drying or curing requirements to avoid dangerous conditions and effects.
 2. Install tarpaulins securely with incombustible wood framing and other materials. Close openings of 25SqFt (2.3SqM) or less with plywood or similar materials.
 3. Close openings through floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.
 4. Where temporary wood or plywood enclosure exceeds 100SqFt (9.2SqM) in area, use UL-labeled, fire-retardant-treated material for framing and main sheathing.
- F. Temporary Lifts and Hoists: Provide facilities for hoisting materials and employees. Truck cranes and similar devices used for hoisting materials are considered “tools and equipment” and not temporary facilities.
- G. Project Identification and Temporary Signs: Prepare project identification and other signs of size indicated. Install signs where indicated to inform the public and persons seeking entrance to the Project. Support on posts or framing of preservative-treated wood or steel. Do not permit installation of unauthorized signs.
 1. Project Identification Signs: Engage an experienced sign painter to apply graphics. Comply with details indicated.

2. Temporary Signs: Prepare signs to provide directional information to construction personnel and visitors.
- H. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than seven (7) days during normal weather or three (3) days when the temperature is expected to rise above 80°F (27°C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material lawfully.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer, as requested by the Designer.
- B. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of the types needed to protect against reasonable predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers" and NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations".
 1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one (1) extinguisher on each floor at or near each usable stairwell.
 2. Store combustible materials in containers in fire-safe locations.
 3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for fighting fires. Prohibit smoking in hazardous fire-exposure areas.
 4. Provide supervision of welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
- C. Permanent Fire Protection: At the earliest feasible date in each area of the Project complete installation of the permanent fire-protection facility including connected services and place into operation and use. Instruct key personnel on use of facilities.
- D. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting including flashing red or amber lights.
- E. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted or that other undesirable effects might result. Avoid use of tools and equipment that produce harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near the site.

3.5 OPERATION, TERMINATION AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
 - 2. Protection: Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
- C. Termination and Removal: Unless the Designer requests that it be maintained longer, remove each temporary facility when the need has ended, when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are the Contractor's property. The Owner reserves the right to take possession of project identification signs.
 - 2. At Substantial Completion, clean and renovate permanent facilities used during the construction period including, but not limited to, the following:
 - a. Replace air filters and clean inside of ductwork and housing.
 - b. Replace significantly worn parts and parts subject to unusual operating conditions.
 - c. Replace lamps burned out or noticeably dimmed by hours of use.

END OF SECTION 015000

SECTION 017329 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.
- B. Contractor is responsible for all cutting, fitting and patching required for alteration Work or to correct or modify newly installed construction, including but not limited to:
 - 1. Coordination between all trades.
 - 2. Performing sequential excavation and backfill.
 - 3. Completing the Work or making its several parts fit together properly or integrate with other Work.
 - 4. Uncovering portions of the Work to provide for installation of ill-timed Work.
 - 5. Removing and replacing defective Work.
 - 6. Removing and replacing Work not conforming to requirements of Contract Documents.
 - 7. Removing samples of installed Work as specified for testing.
 - 8. Providing routine penetrations of non-structural surfaces for installation of materials such as piping and electrical conduit.

1.2 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.
- B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.3 PREINSTALLATION MEETINGS

- A. Cutting and Patching Conference: Conduct conference at Project site.
 - 1. Prior to commencing work requiring cutting and patching, review extent of cutting and patching anticipated and examine procedures for ensuring satisfactory result from cutting and patching work. Require representatives of each entity directly concerned with cutting and patching to attend, including the following:
 - a. Contractor's superintendent.
 - b. Trade supervisor responsible for cutting operations.

- c. Trade supervisor(s) responsible for patching of each type of substrate.
 - d. Mechanical, electrical, and utilities subcontractors' supervisors, to the extent each trade is affecting by cutting and patching operations.
2. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.4 QUALITY ASSURANCE

- A. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
 1. A structural element includes any load-bearing, lateral force-resistant member, and wind or seismic movement resisting construction.
 2. Take precautions and exercise care to ensure Work is removed neatly and without movement or settlement to remainder of building. Contractor will be held liable for any damage, movement, settlement caused thereby or resulting therefrom.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Examples of operating elements include, but are not limited to, the following:
 1. Primary operational systems and equipment.
 2. Fire separation assemblies.
 3. Air or smoke barriers.
 4. Fire-suppression systems.
 5. Plumbing piping systems.
 6. Mechanical systems piping and ducts.
 7. Control systems.
 8. Communication systems.
 9. Fire-detection and -alarm systems.
 10. Electrical wiring systems.
- C. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Examples of miscellaneous elements include, but are not limited to, the following:
 1. Water, moisture, or vapor barriers.
 2. Membranes and flashings.

3. Exterior curtain-wall construction.
 4. Sprayed fire-resistive material.
 5. Equipment supports.
 6. Piping, ductwork, vessels, and equipment.
 7. Noise- and vibration-control elements and systems.
- D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- E. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.
- F. Qualifications: Workmen to have minimum three (3) years' experience in working with materials being cut and patched.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials identical to in-place materials.
1. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 2. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.
- C. Materials used for sealing openings shall have a fire rating equal to or greater than the rating of the floor, ceiling or partition and shall comply with applicable codes.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjacent Occupied Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
 - 2. Restore Work and surfaces with new products in accordance with requirements of the Contract Documents.
- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. Employ original Installer for cutting and patching of newly installed construction; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 6. Proceed with patching after construction operations requiring cutting are complete.

- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - a. Refinish entire surfaces as necessary to provide an even new finish.
 - b. For continuous surfaces, refinish to nearest intersection.
 - c. For assemblies, entirely refinish.
 - d. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - e. Restore damaged pipe covering to its original condition.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Patch subfloors under removed partitions, fixed equipment, etc. by cutting back, applying underlayment, concrete fill or other acceptable leveling fill as necessary to provide subfloor that is level with adjacent existing subfloors and properly prepare to receive finish flooring.
 - b. In renovated rooms/areas to receive new floor finishes, remove existing finish flooring and related materials and prepare subfloor by cutting back, applying concrete fill or other acceptable leveling fill as necessary to provide subfloor that is level and properly prepared to receive new floor finish as required by Room Finish Schedule and material manufacturers written recommendations.
 - c. In renovated rooms/areas to receive new wall finishes, those portions of existing walls that remain shall have their surfaces patched, cut back, or brought forward as necessary, and prepared as required to receive the new finishes per Room Finish Schedule.
 - d. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for the substrate over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 - e. In rooms or areas where patching is required on one wall only, that entire wall is to be refinished to match the existing finish and color, including existing painted doors, door frames and window frames if they occur in that wall.

- f. In rooms or areas where patching is required on two or more walls, all walls, including painted doors, door frames and painted window frames, are to be refinished.
 - 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 - a. In rooms or areas where patching is required in an existing plaster or gypsum wallboard ceiling, the entire ceiling is to be repainted. In rooms where patching is required in existing acoustic tile ceilings, patch ceilings with matching type and pattern of acoustic tile, clean all remaining tile and apply one coat of white latex paint by roller over all tile surfaces. Clean all exposed metal suspension system.
 - 5. Fire-Resistive Materials: Patch and repair to restore fire protection to original condition.
 - 6. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
 - 7. Openings created as a result of removal of materials must be patched to match adjacent construction as to materials and finishes, unless otherwise indicated.
 - a. Provide lintels where openings are cut through existing masonry or concrete walls. Refer to Lintel Schedule as indicated in Section 055000 Metal Fabrications for sizing of lintels, unless lintels are shown on Drawings.
 - 8. Close up the unused portion of the opening with materials matching adjacent construction where existing equipment is removed and new equipment is installed in the existing opening.
 - 9. Paint all exposed insulated or non-insulated pipes and ducts in finished rooms or areas.
 - 10. Patch and repair the floor, walls, and ceiling where existing equipment or assemblies are removed.
- D. Roofing:
- 1. Before commencing with cutting and patching of roofing, consult with the Owner regarding the existence of an outstanding roofing warranty. If such a warranty exists, obtain written approval of the methods to be used from the roofing manufacturer who issued the warranty so as not to affect the value of the warranty.
 - 2. If necessary, cutting and patching of roofing to be performed by roofing manufacturer authorized personnel only.
 - 3. Cut, patch, repair and extend roofing and insulation as follows:
 - a. Where disturbed or damaged by alteration Work or activities related to same.
 - b. Where new Work connects to existing construction.
 - 4. Protect roof areas penetrated for alterations against damage and leaks. Do not leave roof openings uncovered or unprotected overnight or during any periods of rainy or inclement weather.

5. Remove loose aggregate, if applicable, and store away from work area.
6. Work shall be performed in a manner to provide for permanent water-tight splice or repair.
7. Roof repair and alteration Work and materials shall match existing roofing materials and construction.
8. Upon completion and inspection of splice or repair Work, remove debris from the roof and replace the aggregate as required.
9. Protect undisturbed existing and newly repaired roofing subject to traffic and damage.

3.4 CLEANING

- A. Clean areas and spaces where cutting and patching are performed.
- B. Completely remove paint, mortar, oils, putty, and similar materials from any surface not intended to receive these materials.

END OF SECTION 017329

SECTION 017400 - CLEANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for cleaning during the Project.
- B. Environmental Requirements: Conduct cleaning and waste-disposal operations in compliance with local laws and ordinances. Comply fully with federal and local environmental and anti-pollution regulations.
 - 1. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
 - 2. Burning or burying of debris, rubbish, or other waste material on the premises is not permitted.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by the manufacturer or fabricator for the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 PROGRESS CLEANING

A. General

1. Retain all stored items in an orderly arrangement allowing maximum access, not impeding drainage or traffic, and providing the required protection of materials.
2. Do not allow the accumulation of scrap, debris, waste material, and other items not required for construction of this Work.
3. At least twice each month, and more often if necessary, completely remove all scrap, debris, and waste material from the jobsite.
4. Provide adequate storage for all items awaiting removal from the jobsite, observing all requirements for fire protection and protection of the ecology.

B. Site

1. Daily, inspect the site and pick up all scrap, debris, and waste material. Remove all such items to the place designated for their storage.
2. Weekly, inspect all arrangements of materials stored onsite. Re-stack, tidy, or otherwise service all material arrangements.
3. Maintain the site in a neat and orderly condition at all times.

C. Structures

1. Daily, inspect the structures and pick up all scrap, debris, and waste material. Remove all such items to the place designated for their storage.
2. Weekly, sweep all interior spaces clean. "Clean" for the purposes of this paragraph, shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and handheld broom.

3. In preparation for installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using all equipment and materials required to achieve the required cleanliness.
4. Following the installation of finish floor materials, clean the finish floor daily while work is being performed in the space in which finish materials have been installed. "Clean" for the purposes of this subparagraph, shall be interpreted as meaning free from all foreign material which, in the opinion of the Construction Representative, may be injurious to the finish of the finish floor material.

3.2 FINAL CLEANING

- A. General: Provide final cleaning operations when indicated. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of Work to the condition expected from a commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
- B. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for the entire Project or a portion of the Project.
 1. Clean the Project Site, yard and grounds, in areas disturbed by construction activities including landscape development areas, of rubbish, waste material, litter, and foreign substances.
 2. Sweep paved areas broom clean. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 3. Remove petrochemical spills, stains, and other foreign deposits.
 4. Remove tools, construction equipment, machinery, and surplus material from the site.
 5. Remove snow and ice to provide safe access to the building.
 6. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.

7. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
8. Broom clean concrete floors in unoccupied spaces.
9. Vacuum clean carpet and similar soft surfaces removing debris and excess nap. Shampoo, if required.
10. Clean transparent material, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
11. Remove labels that are not permanent labels.
12. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
13. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
14. Clean plumbing fixtures to a sanitary condition free of stains, including stains resulting from water exposure.
15. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
16. Clean ducts, blowers, and coils if units were operated without filters during construction
17. Clean food-service equipment to a sanitary condition, ready and acceptable for its intended use.

18. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs and defective and noisy starters in fluorescent and mercury vapor fixtures.
 19. Leave the Project clean and ready for occupancy.
- C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid the Project of rodents, insects, and other pests. Comply with regulations of local authorities.
- D. Removal of Protection: Remove temporary protection and facilities installed during construction to protect previously completed installations during the remainder of the construction period.
- E. Compliances: Comply with governing regulations and safety standards for cleaning operations. Remove waste materials from the site and dispose of lawfully.
1. Where extra materials of value remain after Final Acceptance by the Owner, they become the Owner's property.

END OF SECTION 017400

SECTION 024119 - SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 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.

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner 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.

1.3 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.4 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.

1.5 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. Inventory: Submit a list of items to be removed and salvaged and deliver to Owner prior to start of demolition.
- 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.

1.6 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.7 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.
 - 1. Provide predemolition photographs documenting all differing and/or unforeseen conditions.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. 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. Storage or sale of removed items or materials on-site is not permitted.
- F. 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.

1.8 WARRANTY

- A. 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.

1.9 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 ANSI/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 record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.
- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- E. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
 - 1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
 - 2. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
 - 1. Comply with requirements for existing services/systems interruptions specified in Division 01 Section "Summary."
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Contractor shall notify Owner and Facilities prior to arranging shut off of indicated utilities with utility companies.
 - 2. 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.
 - 3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.

- d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
 - g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.
- C. Refrigerant: Remove refrigerant from mechanical equipment to be selectively demolished according to 40 CFR 82 and regulations of Authorities Having Jurisdiction.
- D. Electrical Systems Requirements:
- 1. Remove all exposed raceways, exposed and concealed outlet boxes, etc. that are not to be reused where existing walls are to remain. Where new raceways and outlet boxes are shown on existing walls in finished rooms, they shall be installed concealed by cutting and patching method.
 - 2. Reuse existing outlet boxes and raceway systems wherever practical in renovation areas. Install new wiring devices, coverplates, and wiring per applicable specification sections, where such existing outlet boxes are used. Special coverplates may be required to suit conditions.
 - 3. Disconnect and remove, per NEC Articles 770 and 800, exposed feeder, branch circuit, remote control, power limited, non-power limited, and signal line system raceways and their associated circuits and wiring, including wiring for systems and equipment operating at 50 volts or less not installed in raceway rendered inoperable due to removals, relocations and rearrangements. This shall include the complete removal of wiring and cable abandoned by other Divisions, above or below ceilings, as part of this project.
 - 4. Disconnect, remove, rework and otherwise rearrange existing raceways and wiring to accommodate new circuit arrangements indicated and/or required to maintain continuity of existing circuits feeding devices that are to remain.
 - 5. Be responsible for removal and installation of existing electrical equipment to accommodate the work of or disturbed by other trades.
 - 6. In such cases where new circuit breakers or fusible switches are to be added to existing electrical distribution equipment, they shall be of the same manufacturer and design as the existing breakers or fusible switches, except as otherwise noted, and shall be of the sizes as shown on Drawings.
 - a. Be responsible for rearranging any and all existing circuit breakers within the existing equipment, to facilitate the installation of new circuit breakers being added.

Provide additional bus, bus extensions, bolts and hardware, enclosure modifications, directory modifications, etc., required to accomplish these modifications.

- b. Provide new arc-fault signage per Division 26 Sections "Protective Device Coordination" and "Electrical Identification", where changes to the electrical distribution system alter or change the rating, hazard or safety requirements for the room, space, or area.

3.3 PREPARATION

- A. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Division 01 Section "Construction Facilities and Temporary Controls."
- B. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 1. Strengthen or add new supports when required during progress of selective demolition.
- C. Remove temporary barricades and protections where hazards no longer exist.

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand

- tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 5. Maintain fire watch during and for at least two 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.
 - a. Do not bury waste materials from selective demolition activities.
 - b. Do not dispose of waste materials resulting from selective demolition activities into watercourses, storm drainage system, or sanitary sewer system.
 - c. Do not discharge water containing suspended materials into watercourses, storm drainage system, sanitary sewers, or onto adjacent property.
 11. Ensure selective demolition operations do not adversely affect adjacent watercourse, groundwater or wildlife and do not contribute to air and noise pollution.
 12. Cover or dampen dry materials and waste sufficient to prevent blown dust or debris.
- 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.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, then remove concrete between saw cuts.
- B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.
- C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.
- D. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCT's "Recommended Work Practices for the Removal of Resilient Floor Coverings.
- E. "Luminaires:
1. Disconnect, remove, and store, at the job site, in an indoor dry location, luminaires scheduled for reuse, that have been previously determined to not contain PCB fluorescent ballasts, until such time as they are ready to be reinstalled.
 - a. Existing lamps shall not be reused, regardless of whether or not the existing luminaire is scheduled for reuse. Existing lamps shall be legally disposed of, and reused luminaires shall be relamped with new lamps.
 2. Move luminaires that have been previously determined to not contain PCB fluorescent ballasts, and that are scheduled for disconnection and removal, and are not scheduled for reuse or reinstallation, to an on-site location, directed by the Owner. Moved luminaires shall remain the property of the Owner.
 - a. Remove lamps from luminaires, and store separately at an on-site location, directed by the Owner.

3. Remove from the site, and legally dispose of, disconnected and removed luminaires, that have been previously determined to not contain PCB fluorescent ballasts, and that the Owner does not wish to retain.
 - a. Remove lamps from luminaires and dispose of separately.
4. Do not use existing luminaires that have been determined to contain integral or remote mounted PCB fluorescent ballasts, either known, or determined by field survey and investigation.
 - a. Disconnect and remove the PCB containing fluorescent ballast(s), if the ballast(s) is not leaking, per the ballast disposal requirements written herein, and replace with a new non-PCB replacement ballast.
 - b. Notify the project Owner if the PCB containing ballast is leaking, and proceed no further. The luminaire is considered contaminated and hazardous. Removal of the luminaire shall be the responsibility of the Owner.
5. Do not remove or re-use existing luminaires installed in project spaces being abated for asbestos. Luminaires installed in project spaces being abated for asbestos shall be considered hazardous material, and as such shall be removed as part of the abatement process.
6. Do not remove existing luminaires installed in suspended, or other false ceiling spaces below known asbestos containing ceiling cavities. Luminaires installed in such ceiling spaces shall be considered hazardous material, and their removal shall be responsibility of the Owner.

F. Lamp Disposal:

1. Fluorescent, mercury vapor, metal halide, high pressure sodium, and neon lamps, contain some amount of the chemical mercury, and as such shall be handled as hazardous waste.
2. Lamp removal and disposal (both mercury containing and low-mercury types) shall be legally disposed of, in accordance with the requirements of the United States Environmental Protection Agency (USEPA) Universal Waste Rule (64 FR 36465-36490), and the state and local level project locale disposal requirements.
3. Remove lamps separately from their respective luminaires, and place (unbroken) into approved, labeled containers.
 - a. Containers may be new cardboard boxes with cardboard lamp sleeves, or discarded cardboard boxes from new lamps with the lamp spacers left intact.
4. The total weight for all on-site, project related, disposed lamp containers, cannot exceed 500 lbs. at any one time. The containers shall be removed from the project site, delivered or picked-up by a licensed lamp recycler, and legally disposed of, within 1 year of lamp removal.

G. Fluorescent Lamp Ballast Disposal:

1. Dispose of ballasts identified or labeled "NON-PCB", "NO PCB", or similar marking, (indicating that the ballast does not contain PCB), as ordinary construction waste.
2. Ballasts not identified or labeled "NON-PCB", "NO PCB", or similar marking (indicating that the ballast does not contain PCB), shall be presumed to be PCB containing, and shall be handled as hazardous waste.
3. Remove non-leaking ballasts containing PCB, or presumed to be containing PCB, from their respective luminaires.
 - a. Provide protective gloves, eye protection, and protective clothing, for the person(s) removing ballasts.
 - b. Place removed ballasts in contractor provided 55 or 30 gallon, US DOT approved, type 17C, or 17H drums (barrels). The quantity and size of the drums shall be determined by the Contractor.
 - c. Provide approved PCB absorbent materials placed and stored immediately adjacent to the drum storage area. Do not place loose absorbent material inside the drums.
 - d. Label and mark the PCB ballast storage drums with EPA approved PCB labels, and provide the appropriate warning signs, markings, and clearance lines, to meet the federal, state, and local hazardous materials handling regulations.
 - e. Place barrels containing removed PCB containing ballasts at an on-site, indoor storage location, sealed with the cover that came with the barrels. Barrels shall not be placed outside exposed to weather.
 - f. Provide to the Project representative, in written form, the total count of the ballasts removed (or their total weight by barrel), and where they are stored.
 - g. Barrels containing removed PCB ballasts shall not to be removed from the work site by the Contractor. To do so, would be a violation of DOT hazardous waste regulations and may result in a fine. Provide for the services of an authorized hazardous waste hauler to remove and deliver the ballasts to an authorized recycler, or PCB incinerator facility.
4. Do not remove ballasts containing PCB, or presumed to be containing PCB, that are visibly showing signs of leakage (evidenced by potting compound leakage or by an oily film on the ballast surface), from their respective luminaire. The entire luminaire shall be presumed to be contaminated, and shall be handled as a hazardous material.
 - a. Notify the project Owner, and proceed no further. Removal of the luminaire shall be the responsibility of the Owner.

H. Wire and Cable:

1. Disconnect and remove, per NEC Articles 770 and 800, exposed feeder, branch circuit, remote control, power limited, non-power limited, and signal line system raceways and their associated circuits and wiring, including wiring for systems and equipment operating at 50 volts or less not installed in raceway rendered inoperable due to removals, relocations and rearrangements. This shall include the complete removal of wiring and cable abandoned by other Divisions, above or below ceilings, as part of this project.

I. Smoke Detectors:

1. Remove existing ionization type smoke detectors (that the Owner does not wish to keep) from the project site, delivered to either a licensed and certified recycling provider, or to the original equipment manufacturer, for recycling and their disposal. Landfill disposal or construction waste disposal of ionization type smoke detectors is not permitted.
 - a. Dispose of photoelectric type smoke detectors as ordinary waste.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
 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.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.7 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 024119

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes cast-in-place concrete, including reinforcement, concrete materials, mixture design, placement procedures, and finishes.
- B. Responsibility of Contractor:
 - 1. The design, strength, safety, and adequacy of all shoring, bracing and all methods of construction are the responsibility of the Contractor. No action by the Architect/Engineer will eliminate, lessen or restrict this responsibility in any manner.
- C. Cooperation with Work of Other Sections:
 - 1. Coordinate, cooperate and assist with installation of items furnished and installed by other trades.
 - 2. Examine the Drawings and Specifications for all Contracts to determine nature of proposed construction. Perform work in a manner that will not interfere or delay work of other Contractors. Cooperate with other trades regarding installation of embedded items. Templates and instructions will be provided for setting items placed in forms.
 - 3. Inform those performing Work of other Sections, in writing or by schedules, of requirements for services, materials and built-in items prepared or supplied by other Sections that affect Work of this Section.

1.2 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
- B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.3 PRE-INSTALLATION MEETINGS

A. Pre-installation Conference:

1. Before submitting concrete design mixtures, review concrete design mixture requirements and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Laboratory responsible for concrete design mixtures.
 - c. Ready-mix concrete manufacturer.
 - d. Concrete subcontractor.
 - e. Structural Engineer.
 - f. Contractor's Testing Agency.
 - g. Site subcontractor.
 - h. Admixture manufacturer(s).
 - i. Concrete pumping equipment operator.
 - j. Special concrete finish subcontractor.
2. Review the following:
 - a. Requirements for submittals.
 - b. Status of coordinating work.
 - c. Availability of materials.
 - d. Proposed work progress schedule including submittal schedule.
 - e. Special inspection and testing and inspecting agency procedures for field quality control.

- f. Concrete finishes and finishing.
 - g. Curing procedures.
 - h. Construction contraction and isolation joints, and joint-filler strips.
 - i. Semi rigid joint fillers.
 - j. Vapor barrier installation.
 - k. Anchor rod and anchorage device installation tolerances.
 - l. Steel reinforcement installation.
 - m. Methods for achieving specified floor and slab flatness and levelness.
 - n. Floor and slab flatness and levelness measurement.
 - o. Concrete repair procedures.
 - p. Concrete protection.
3. Record and distribute legible meeting minutes within five (5) days to all parties in attendance at the conference. Include a statement from the suppliers indicating that the proposed concrete mix design(s) and method(s) of placement will produce concrete(s) of the quality required by these Specifications. Transmit an additional copy to the Owner's Representative.

1.4 ACTION SUBMITTALS

- 1. Concrete Design Mixtures: Refer to section "Concrete Mixtures" for requirements. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments. Clearly indicate the use of each mix design on the submittal.
- 2. Include test reports of the following:
 - a. Gradation analysis and soundness tests for coarse and fine aggregate. Identify sources of aggregate.
 - b. Mill test reports on cement, including brand, type and source of supply.

- c. Compression tests on trial cylinders.
 - d. Slump and air content of trial batches.
 - e. Admixture certification, including chloride ion content.
- 3. Indicate amounts of mixing water, if any, to be withheld for later addition at Project site.
- B. Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement. Clearly indicate the splice length for every size and type of bar used. Clearly indicate the cover provided for reinforcement. Include all other project requirements affecting reinforcing details and placing.
- C. Shop drawings showing location of all construction joints, sleeves, depressions and curbs.
- D. Method of developing bond at joints.
- E. Samples:
 - 1. For vapor barrier

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Welding certificates.
- C. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Steel reinforcement and accessories.
 - 4. Curing and sealing compounds.

5. Floor and slab treatments.
 6. Bonding agents.
 7. Adhesives.
 8. Vapor barriers Semirigid joint filler.
 9. Joint-filler strips.
 10. Repair materials.
 11. Proprietary embedments and accessories.
- D. Material Test Reports: For the following, from a qualified testing agency:
1. Aggregates.
- E. Mill Test Reports: Submit certified copies of mill test reports for reinforcing steel, including statement of compliance with specified ASTM Standards.
- F. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.
- G. Field quality-control reports.
- H. Minutes of pre-installation conference.

1.6 QUALITY ASSURANCE

- A. References and Standards: Except as modified by governing codes and as otherwise specified herein, perform work in accordance with the provisions and recommendations of the latest editions of the following codes and standards, copies of which are to be available in the field:
1. ACI 117 Specification for Tolerances for Concrete Construction and Materials
 2. ACI 211.1 Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete

3. ACI 301 Specifications for Structural Concrete
 4. ACI 304.2 Placing Concrete by Pumping Methods
 5. ACI 315 Details and Detailing of Concrete Reinforcement
 6. ACI 318 Building Code Requirements for Structural Concrete
 7. AWS D1.4 Structural Welding Code – Reinforcing Bars
 8. NRMCA Concrete Plant Standards and Truck Mixer and Agitator Standards
 9. CRSI Placing Reinforcing Bars
- B. In case of conflict between specified codes and standards, the most stringent requirements govern. In case of conflict between specified standards and project Specifications, project Specifications govern. In case of conflicts between Contract Documents, immediately notify the Architect/Engineer for resolution.
- C. Responsibility of the Contractor:
1. The strength, slump, consistency, finish and general quality of concrete are the responsibility of the Contractor. No action by the Architect/Engineer will eliminate, lessen or restrict this responsibility in any manner.
- D. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- E. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- F. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.

G. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4.

1.7 ALLOWABLE TOLERANCES

1. Flatwork is based on industry standard "f" numbers. Numbers given are guidelines for overall ff/fl numbers:

B. Flatwork: Finish concrete flatwork to the following surface profile tolerances when measured in accordance with ASTM E 1155:

1. Ff = Face floor flatness number.
2. Fl = Face floor levelness number.
3. All slabs-on-ground and shored concrete slabs not otherwise specified:
 - a. Overall Ff = 25/Fl 20.
 - b. Local Ff = 17/Fl 13.
4. Concrete floor slabs must maintain the design slab thickness as a minimum. To achieve the levelness requirements listed above, more concrete will need to be added above the minimum slab thickness in locations where the supporting structure deflects. To achieve the higher degrees of floor levelness listed, it is expected that laser guided screeds or similar devices will be necessary to provide accurate strike off of the concrete surface.
5. Refer to Part 3 "Repair of Defective Concrete Surfaces" for repair of any floor section which measures below the listed tolerances.

1.8 COOPERATION WITH TESTING AGENCY

- A. The Contractor will engage a Testing Agency at his own expense, acceptable to the Architect/Engineer, to perform detailed concrete quality control, testing and inspection. Provide the Testing Agency with the following:
1. Materials, samples, and access to materials as required for testing.
 2. Minimum one day's advance notice when concrete is to be placed.
 3. Incidental labor required to facilitate testing.
 4. Approved on-site storage facilities for concrete test cylinders.
 5. Copies of the delivery ticket of each load of concrete as it arrives at the jobsite. Identify the concrete mix design strength, water/cement ratio, type and size of coarse aggregate, batch plant of origin and time cement was discharged into the delivery truck.
 6. Copy of the most current reinforcing steel shop drawings that have been reviewed by the Architect/Engineer, and access to the Contract Documents.
 7. Reimbursement of costs for testing and inspection resulting as a consequence of the following:
 - a. Work not in compliance with the Contract Documents.
 - b. Testing requested by the Contractor or Subcontractor such as additional cylinders for early breaks for form removal, etc.
 - c. Testing to verify the adequacy of work done without prior notice, without proper supervision or contrary to standard construction practice.
 - d. Changes in source, quality or characteristics or materials.
 - e. Wasted time of inspectors because of cancellations or delays of concrete placement or other work.
- B. Do not place concrete until the Contractor's Testing Agency has reviewed and approved the work, and all reported deficiencies have been corrected. Concrete placed prior to approval is subject to removal.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Comply with ACI 301 Section 5 and with ACI 304.
- B. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and protect from damage, dirt, and corrosion. Store reinforcing under cover and off the ground. Avoid damaging coatings on steel reinforcement.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- A. Use materials from the same source from the start to the finish of the project, unless a change is accepted in writing by the Architect/Engineer.

2.2 STEEL REINFORCEMENT

- A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- B. Reinforcing Bars: ASTM A 615, Grade 60, deformed.
- C. Welded Wire Reinforcement: ASTM A 1064. Deliver in sheets, not in rolls.
- D. Smooth Round Steel Dowels: ASTM A 615 or A 36. Ends of dowels are to be sawn squared ends or grind each end to remove all projecting burrs. Place dowels in dowel baskets to maintain alignment during concrete placement. Thoroughly coat at least half the length of each dowel with a bond breaking material such as grease. Use epoxy coated dowels where epoxy coated reinforcing is used.

2.3 REINFORCEMENT ACCESSORIES

- A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice." Wood blocks, stones, and brick chips are not acceptable. Supports to be capable of supporting a 300

pound concentrated load without measureable permanent deformation of the reinforcement or supports or indentation of the supporting surface.

- B. Tie Wire: Use annealed tie wire of not less than #18 gauge. Use epoxy coated tie wire with epoxy coated reinforcing bars.

2.4 CONCRETE MATERIALS

- A. Regional Materials: Concrete shall be manufactured within 500 miles of Project site from aggregates and cementitious materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of Project site.
- B. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- C. Cementitious Materials: Provide each cementitious material from a single domestic source.
 - 1. Portland Cement: ASTM C 150, Type I. Do not exceed an alkali content of 0.6 percent unless the manufacturer certifies that no alkali reactivity is produced with the proposed combination of materials when tested in accordance with ASTM C 227.
 - 2. Fly Ash: ASTM C 618, Class F. Maximum 3 percent loss on ignition with no soda ash content allowed. Report the chemical analysis of the fly ash in accordance with ASTM C 311. Provide at a replacement rate of 25 percent minimum, by mass.
 - 3. Slag Cement: ASTM C 989, Grade 120. Not to exceed 50 percent of total cementitious materials nor 250 pounds per cubic yard. Provide at a replacement rate of 25 percent minimum, by mass for interior concrete.
- D. Normal-Weight Aggregates: ASTM C 33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.
 - 1. Coarse Aggregate: Washed, non-reactive well graded crushed stone or gravel.
 - 2. Fine Aggregate: Washed, inert, non-reactive natural sand with a fineness modulus of 2.40 to 3.00. For pumped concrete, 15 to 30 percent passing Number 50 sieve, and 5 to 10 percent passing a Number 100 sieve. Comply with ACI 302 Table 5.1 for slab-on-grade fine aggregates.

3. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing intentionally added chlorides.
4. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Corporation.
 - b. Euclid Chemical Company (The).
 - c. GCP Applied Technologies.
 - d. Sika Corporation.
5. Air-Entraining Admixture: ASTM C 260.
6. Water-Reducing Admixture: ASTM C 494, Type A.
7. Mid-Range Water Reducing Admixture: ASTM C 494, Type A.
8. Retarding Admixture: ASTM C 494, Type B.
9. Accelerating Admixture: ASTM C 494, Type C or E, non-corrosive, containing no chloride.
10. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
11. High-Range, Water-Reducing Admixture: ASTM C 494, Type F. Use only with prior review and acceptance of Architect/Engineer. Provide a qualified technical representative of the admixture supplier on-site during initial concrete placements to assist in proper usage.
12. Plasticizing and Retarding Admixture: ASTM C 1017, Type II.
13. Calcium Nitrite Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C 494, Type C. Dosage rate of 2 to 4 gallons per cubic yard.

14. Shrinkage Reducing Admixture: ASTM C 494, Type S.
15. Workability Retaining Admixture: ASTM C 494, Type S.
16. Water: ASTM C 1602, potable, clean and free from deleterious substances.

2.5 VAPOR BARRIER

- A. Sheet Vapor Barrier: ASTM E 1745, Class A. The water-vapor permeance must be less than 0.01 perms as tested before and after conditioning. Minimum thickness of 15 mils. Include manufacturer's recommended adhesive or pressure-sensitive tape.
 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Insulation Solutions, Inc.; Viper Vaporcheck II 15 mil.
 - b. Stego Industries, LLC; Stego Wrap 15 mil.
 - c. W.R. Meadows, Inc; Perminator 15 mil.

2.6 FLOOR AND SLAB TREATMENTS

- A. Slip-Resistive Emery Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive, crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials with 100 percent passing No. 4 sieve.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Corporation.
 - b. Dayton Superior.

- c. Euclid Chemical Co. (The).
 - d. L&M Construction Chemicals, Inc.
 - 2. Retain "Unpigmented Mineral Dry-Shake Floor Hardener" Paragraph below if unpigmented mineral dry-shake floor hardeners are required. Verify suitability with manufacturer if air content of concrete exceeds 3 percent.
- B. Unpigmented Mineral Dry-Shake Floor Hardener: Factory-packaged dry combination of portland cement, graded quartz aggregate, and plasticizing admixture.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Corporation.
 - b. Dayton Superior.
 - c. Euclid Chemical Company (The).
 - d. L&M Construction Chemicals, Inc.

2.7 LIQUID FLOOR TREATMENTS

- A. Liquid Densifier/Sealer: 100 percent active colorless aqueous siliconate solution. Apply to moist cured floors where indicated on the Contract Documents at the manufacturer's suggested rate and method of application. Subject to compliance with requirements provide one of the following:
 - 1. Euclid Chemical Co. (The); Euco Diamond Hard.
 - 2. CureCrete Distribution, Inc.; Ashford Formula.
 - 3. L&M Construction Chemicals, Inc.; Seal Hard.
- B. Penetrating Sealer: High penetration silane sealer providing minimum 95 percent screening per NCHRP 244 standards for chloride ion penetration resistance. For use on parking garage ramps and decks; requires moist curing of slab. Subject to compliance with requirements provide one of the following:

1. BASF Corporation; Master Protect H 400.
2. Euclid Chemical Co. (The); Baracade Silane 40.
3. L&M Construction Chemicals, Inc.; Aquapel Plus.
4. Sika Corporation; Sikaguard 705.
5. SpecChem; SpecSilane 40 WB.
6. Liquid floor treatments shall comply with the testing and product 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."

2.8 CURING MATERIALS

- A. Moist Curing: Moist Cure all concrete using the following products. Any technique selected must keep concrete surface continuously wet during the full curing period. Periodic re-application of moisture is expressly prohibited.
 1. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
 2. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
 3. Water: Potable.

2.9 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1752, non-bituminous.
- B. Semi-Rigid Joint Filler: Moisture insensitive, two-component, semi-rigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 according to ASTM D 2240.
- C. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

- D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
 - 1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- E. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.
- F. Epoxy Grout: For drilling and grouting rebar in hardened concrete. Subject to compliance with requirements, provide comparable product by one of the following. Submit product data showing compliance with the basis of design product.
 - 1. BASF Corporation, Master Emaco ADH Series.
 - 2. Hilti; HIT-HY 200.
 - 3. Red Head; EPCON C6.
 - 4. Simpson Strong Tie Co.; SET Epoxy-Tie.
- G. Non-Shrink, Non-Metallic Standard Cement Grout: For use under steel base plates, steel bearing plates, and joist bearing plates. Factory premixed grout with no drying, shrinkage or settlement at any age. Compressive strength per ASTM C 109 of not less than 5,000 psi at 7 days and 7,500 psi at 28 days when placed in flowable consistency.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Corporation.
 - b. Euclid Chemical Co. (The).
 - c. L&M Construction Chemicals, Inc.
 - d. Sika Corporation.

H. Non-Shrink, Non-Metallic Precision Grout: For use under machine base plates and other applications with vibration and/or load reversals.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. BASF Corporation.
- b. Euclid Chemical Co. (The).
- c. L&M Construction Chemicals, Inc.
- d. Sika Corporation.

2.10 REPAIR MATERIALS

A. Non-Shrink Patching Mixture: Specially formulated high bond package mixture.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. BASF Corporation.
- b. Euclid Chemical Co. (The).
- c. L & M Construction Chemicals, Inc.
- d. Sika Corporation.

B. Polymer Patching Mortar: Free flowing, polymer modified cementitious mortar.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. BASF Corporation.
- b. Euclid Chemical Co. (The).
- c. L & M Construction Chemicals, Inc.

- d. Sika Corporation.

2.11 CONCRETE MIXTURES

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
 - 1. Use a qualified independent testing agency familiar with local construction conditions for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
 - 2. Provide separate design mixes for each proposed type of concrete, including changes in admixtures, changes in strength, changes in mix proportions, changes in exposure and/or air content, concrete density, and whether or not the concrete is pumped. Clearly identify the proposed use for each mix in the design submittal.
 - 3. Prepare and submit the mix designs with sufficient lead time to allow testing, submittal review and adjustment of the mix prior to casting concrete on the project. Include concrete strength, mix proportions, slump, density, air content, appropriate test data, and admixture data sheets for each design mix.
 - 4. Concrete mix design submittals that are incomplete or do not satisfy the requirements of the Specifications will be rejected. Provide additional testing and/or adjust the mix design as needed to achieve compliance and re-submit for review. Do not place any concrete in the Work until the appropriate mix design has been reviewed and accepted by the Architect/Engineer.
 - 5. Provide additional mix designs and appropriate backup information for any revisions to the approved concrete mix designs requested by the Contractor during the course of work. Do not use the revised mix until submittal is reviewed and accepted by the Architect/Engineer.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 - 1. Fly Ash: 25 percent.
 - 2. Combined Fly Ash and Pozzolan: 25 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

- D. Admixtures: Use admixtures according to manufacturer's written instructions.
1. Use water-reducing high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
 2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 3. Use accelerating admixture when required by cold temperatures or other adverse placement conditions for cold weather concreting.
 4. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a w/cm ratio below 0.50.
 5. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
- E. For slab-on-ground concrete, formulate the concrete mix design to minimize the amount of cement and water necessary to produce the required slump and workability. Utilize properly graded aggregates of cubical shape to minimize water and cement demand. For interior slab-on-ground concrete, limit the cement content to a maximum of 540 pounds per cubic yard.
- F. In addition to the concrete mix design requirements listed above, limit the w/cm ratio to the following maximums:
1. 0.40 for reinforced concrete exposed to deicing salts, brackish water or salt spray.
 2. 0.45 for concrete required to be watertight and/or subject to cycles of freezing and thawing (including foundation walls).
 3. 0.50 for all concrete not otherwise specified.
- G. Limit the slump of all concrete containing a high range water reducing admixture to 9 inches unless otherwise approved by the Architect/Engineer. Bring concrete to the job site with a slump of 3 inches +/- 1 inch, and then add the high range water reducing admixture to increase the slump to the approved level. Proportion design mixes of all other concrete to result in concrete with the following slumps measured at the point of placement:
1. Slabs-on-ground 4" +/- 1"

2. Footings, massive sections 3" +/- 1"
 3. All other concrete 3" +/- 1"
- H. Use the following maximum coarse aggregate sizes, per ASTM C 33:
1. Size 7 for tight pours and thin sections.
 2. Size 467 for standard slabs-on-ground and foundations.
 3. Size 67 for all other concrete.
- I. Specifically identify concrete mixes, which are intended to be placed by pumping. Indicate the modifications made to the basic mix to aid in pumping, including changes in slump, air content, fly ash content, cement paste vs. aggregate content, and admixtures such as super plasticizers. Pre-soak all lightweight aggregates in pumped concrete per the lightweight aggregate manufacturer's recommendations. Carefully control the gradation of the coarse and fine aggregates, keeping the grading as close to the middle of the ASTM C 33 or C 330 range as possible.
- J. Make one test of each concrete design mix to verify that the total chloride ion (Cl-) content is less than 0.10 percent of the weight of the cement, that the total sulfate (as SO₃) content of the mix is less than 0.05 percent of the weight of the mix, per ASTM C 114, and that the thiocyanate ion (as SCN-) content is less than 0.15 percent of the weight of the cement.
- K. Adjust mix designs that do not prove to be satisfactory in use, subject to the Architect/ Engineer's review. Concrete that does not consistently exhibit the specified control characteristics will be considered unsatisfactory. Any additional costs incurred due to changes required to provide a satisfactory concrete mix are to be borne by the Contractor.

2.12 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."
- B. Accurately form the reinforcement to dimensions on the approved shop drawings, details, and schedules.
- C. Do not commence fabrication until the shop drawings, details, and schedules have been reviewed by the Architect/Engineer.

- D. Cold bend all reinforcement. Do not heat reinforcement for any purpose except as specifically accepted by the Architect/Engineer.
- E. Do not form bars in a manner injurious to bars. Bars with kinks or bends not shown on the drawings and bars reduced in section will be rejected.
- F. Avoid splicing reinforcing at points of maximum stress.

PART 3 - EXECUTION

3.1 EMBEDDED ITEM INSTALLATION

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303. Use line and transit to locate anchor rods and secure with templates to prevent displacement during concreting operations.
- B. Install all embedded items to conform to the requirements of ACI 318, Chapter 6, Paragraph 6.3, "Conduits and Pipes Embedded in Concrete," and as specified below. Do not install any accessories until their type and location have been verified by the affected trades.
- C. Coordinate the installation of all inserts required by other trades prior to the placing of reinforcing steel.
- D. Provide steel sleeves for pipes passing through concrete.

3.2 VAPOR BARRIER INSTALLATION

- A. Sheet Vapor Barriers: Place, protect, and repair sheet vapor barrier/retarder according to ASTM E 1643 and manufacturer's written instructions.
 - 1. Lap joints 6 inches and seal with manufacturers recommended tape.
 - 2. Seal permanent penetrations with compatible mastic or manufacturer's tape.

3. Lap vapor barrier over footings.
4. Repair all damaged areas by cutting patches of vapor barrier, overlapping damaged areas 6 inches, and taping all four sides with manufacturers tape.

3.3 STEEL REINFORCEMENT INSTALLATION

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
 1. Do not cut or puncture vapor retarder/barrier. Repair damage and reseal vapor retarder/barrier before placing concrete.
- B. Install reinforcement only from Shop Drawings which have been reviewed by the Architect/ Engineer.
- C. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.
- D. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
 1. Weld reinforcing bars according to AWS D1.4cx, only where indicated.
- E. Do not tack weld mesh reinforcement around structural steel members to be encased in concrete. Use tie wires and lap to securely hold in position.
- F. Tie reinforcement with specified tie wire, and bend all wire back beyond the general plane of reinforcement:
 1. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- G. Install welded-wire reinforcement in longest practicable lengths on bar supports spaced to maintain the reinforcing in its proper position during placement of the concrete. Lap edges and ends of adjoining sheets at least one mesh spacing + 2 inches, but not less than 6 inches. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

- H. Bending, tack welding, cutting or substituting reinforcement in the field, other than that shown on the Contract Drawings is prohibited, unless specific approval for each case is given by the Architect/Engineer.
- I. Avoid exposure of reinforcement to the weather for any considerable length of time before placing of concrete. Where this is unavoidable, paint reinforcement with a heavy coat of cement grout. Protect the exposed concrete and any other materials against staining from exposed reinforcement.
- J. After reinforcement is placed but before the concrete is cast, check all reinforcement to insure that it conforms to Contract Drawings, approved shop detail drawings and Specification requirements. Use only qualified experienced personnel to check. Notify the Architect/Engineer's representative at least 36 hours (excluding weekends and holidays) prior to the concrete placement to provide opportunity to inspect the completed reinforcement and formwork before concrete placement.
- K. Remove and replace damaged bars.
- L. Splice reinforcement only as shown on the Drawings or as approved by the Architect/Engineer.
- M. Provide reinforcement butt splices that develop not less than 125 percent of the specified yield strength of the reinforcing bar in tension.
 - 1. Thoroughly clean the ends of all reinforcing bars and other items used to form butt splices with a power-driven wire brush to remove rust and foreign matter. Completely dry all splice components. Use proper equipment for preheating in order to avoid deposits of carbon or other foreign matter on contact surfaces to be jointed. Saw cut square or remove minor projections from the bar end where required in order to make proper fitted splices. Perform cutting in a manner to avoid under-cutting or reducing the net cross-sectional area of the bar.
 - 2. Make all splices so that bars being jointed are parallel and not offset more than 1/8 inch nor out of straight alignment by more than 1/4 inch in 10 feet. Place the top of vertical bars within +/- 1 inch of specified elevation as shown on the Contract Drawings.
 - 3. Use arc welded splices that conform to all requirements of the American Welding Society D12.1.

4. Perform mechanical butt splicing using threaded bar couplers in accordance with manufacturer's instructions, as reviewed by the Architect/Engineer. The manufacturer shall provide competent technical staff at the job site to demonstrate and to instruct the field personnel in the use of the splicing process and to assist in solving field problems.

3.4 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by the Structural Engineer.
 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
 3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 4. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 5. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-On-Ground: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8 inch wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

- D. Isolation Joints in Slabs-On-Ground: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
 - 2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Division 07 Section "Joint Sealants," are indicated.
 - 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints: Install dowel bars or alternate joint reinforcing and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint. Provide adequate supports to maintain dowels in proper position during concrete placement, perpendicular to the joint face.

3.5 CONCRETE MIXING AND DELIVERY

- A. Supply all concrete from a ready-mix plant acceptable to the Architect/Engineer. Batch all constituents, including admixtures, at the central batch plant, except for HRWRs which may be added at the job site.
- B. Comply with ACI 304 recommendations. Accurately weigh all materials. Mix, dispense, and use admixtures in accordance with the specific manufacturer's written instructions and according to ASTM C 94. Furnish batch ticket information.
- C. Conform to Truck Mixer and Agitator Standard of the Truck Mixer Manufacturer's Bureau of the National Ready-Mixed Concrete Association, as well as ASTM C 94. Do not load trucks in excess of NRMCA ratings for normal weight aggregate concrete.
- D. The contractor has no authority whatsoever to add water to the concrete mix once delivered to the site (at the truck). Any concrete identified as having water added to it will be entirely removed and replaced at the Contractor's expense.

- E. Discharge of Materials: Discharge concrete without segregation of the ingredients. Incorporate all concrete in the work in its final shape and location within 90 minutes after the introduction of water to the mix or within a shorter time period as the Testing Agency may direct during hot weather. Immediately remove all concrete materials from the construction site not incorporated into the Work within the specified time limits at the Contractor's expense.
 - 1. Delete below except for projects where site mixing is acceptable. ACI 301 (ACI 301M) applies measuring, batching, and mixing requirements from ASTM C 94/C 94M to Project-site mixing.

3.6 CONCRETE PLACEMENT

- A. Comply with ACI 301 Section 5 and as modified below.
- B. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed. Complete all corrective work identified from required inspections.
- C. Remove water and all foreign matter from place of deposit. Do not place any concrete into any form or excavation containing trash, free water, frost, ice or frozen ground. Provide adequate protection against frost action during freezing weather.
- D. For slabs containing MVRA, install product according to and in compliance with the manufacturer's published data sheet to maintain product warranty. This includes but is not limited to dosing instructions, onsite representation requirements, and the use of an ASTM E 1745 vapor retarder, installed following ASTM E 1643 and ASTM F 710 guidelines.
- E. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation and to avoid displacement of reinforcing.
 - 1. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 2. Provide a baffle plate or spout at the discharge end of the chute to prevent segregation. Use a downpipe, elephant trunk, spout or other appropriate method to prevent concrete from falling freely through a height of more than 3 feet. When the operation is intermittent, discharge the chute into a hopper.

3. Consolidate placed concrete with mechanical vibrating equipment according to ACI 309 Guide for Consolidation of Concrete.
 4. Do not use vibrators to transport concrete inside forms. Do not allow concrete to flow horizontally within forms over a distance exceeding 5 feet. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- F. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete. Do not place concrete flatwork in the rain. Protect exposed concrete surfaces from rain until final set occurs.
1. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 2. Maintain reinforcement in position on chairs during concrete placement.
 3. Finish all concrete flatwork to the elevations shown on the Contract Documents. Provide additional concrete as necessary to compensate for formwork settlement and deflection due to the weight of the wet concrete.
- G. Do not place concrete through holes in sides of forms unless specific permission is given by the Architect/Engineer.
- H. Provide runways to allow wheeled concrete transport equipment to move over reinforcement. Do not support runways on reinforcement.
- I. Schedule the work so that a section begun on any one day is completed on the same day.
- J. Thoroughly clean foreign materials and laitance from all construction joints including vertical and inclined surfaces. Where necessary, roughen the joint with suitable tools such as chipping hammers, wire brushes, etc., and re-clean with a stream of water or compressed air. Saturate the joints with water.
- K. Use an epoxy bonding adhesive when bonding fresh concrete to fully cured existing concrete. Follow manufacturer's instructions. Place new concrete while the bonding agent is still tacky.

- L. Thoroughly clean chutes, hoppers, spouts, adjacent work, etc. before and after each run. Discharge the water and debris outside the form.
- M. For two course pours, clean and thoroughly moisten the base slab prior to placing the concrete fill. Remove any visible water left on the base slab just prior to placing the concrete fill. Alternatively, use the specified epoxy bonding adhesive applied to a clean concrete surface.

3.7 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Preliminary Slab Finishing: For all slabs regardless of final finish:
 - 1. Accurately strike off the top surface of the flatwork to provide a true and level surface within the required tolerances. Use a vibratory screed whenever the concrete mix contains steel fibers. After concrete has been placed, consolidated, and struck off, highway straightedge and/or highway bull float the surface. Remove all water and foreign material that may work to the surface as soon as the condition of the slab permits and before it has hardened appreciably. When water sheen has disappeared, use power driven float blades to compact the surface. Recheck the surface for trueness and levelness; re-straighten, fill, or cut down with a 10 foot highway straightedge to achieve the specified Ff numbers. Slope slabs uniformly to drains where required.
- C. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch in one direction.
 - 1. Apply scratch finish to surfaces to receive concrete floor toppings or to receive mortar setting beds for bonded cementitious floor finishes.
- D. Float Finish: After completion of preliminary slab finishing, repeat float passes and restraighening until surface is left with a uniform, smooth, granular texture.
 - 1. Apply float finish to surfaces indicated.
- E. Trowel Finish: Wait until the water sheen has disappeared or the mix has stiffened sufficiently to permit the proper operation of a power driven trowel. Power trowel the surface to produce a

smooth surface which is relatively free of defects but which may still contain some trowel marks. Hand trowel locations inaccessible to the power driven machine with wood, aluminum, or magnesium trowels. Recheck trueness of surface with a 10 foot highway straightedge applied at no fewer than two different angles. Cut down high spots and fill in low spots to produce a finished surface within the specified tolerances. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
 2. Finish surfaces to the tolerances listed in Part 1 of this specification section.
- F. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thinset method. While concrete is still plastic, slightly scarify surface with a fine broom.
1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.
- G. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.
1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.
- H. Slip-Resistive Finish: Before final floating, apply slip-resistive aggregate finish where indicated and to concrete stair treads, platforms, and ramps. Apply according to manufacturer's written instructions and as follows:
1. Uniformly spread 25 lb./100 sq. ft. of dampened slip-resistive aggregate over surface in one or two applications. Tamp aggregate flush with surface, but do not force below surface.
 2. After broadcasting and tamping, apply float finish.
 3. After curing, lightly work surface with a steel wire brush or an abrasive stone and water to expose slip-resistive aggregate.

- I. Dry-Shake Floor Hardener Finish: After initial floating, apply dry-shake floor hardener to surfaces according to manufacturer's written instructions and as follows:
 1. Uniformly apply dry-shake floor hardener at a rate of 100 lb./100 sq. ft. unless greater amount is recommended by manufacturer.
 2. Uniformly distribute approximately two-thirds of dry-shake floor hardener over surface by hand or with mechanical spreader, and embed by power floating. Follow power floating with a second dry-shake floor hardener application, uniformly distributing remainder of material, and embed by power floating.
 3. After final floating, apply a trowel finish.

3.8 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Curing – Moisture Retention: Maintain the concrete in a continually moist condition for a minimum of seven (7) days. Avoid rapid drying at the end of the curing period.
 1. Unformed Surfaces: Begin curing immediately after finishing concrete.
- C. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray; periodic sprinkling is not acceptable.

- c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 - d. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
- D. Protection from Mechanical Injury: During the curing period, protect concrete from damages including load stresses, heavy shock, excessive vibration, damage caused by rain or flowing water, and damage by subsequent construction operations.
- E. Wait a minimum of 48 hours after finishing slabs before allowing foot traffic. Do not allow construction traffic or loads to be applied to slabs-on-ground until the concrete is seven (7) days old.

3.9 LIQUID FLOOR TREATMENT APPLICATION

- A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.
 - 1. Remove sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
 - 2. Do not apply to concrete that is less than 28 days' old.
 - 3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second coat in a similar manner if surface is rough or porous.

3.10 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
 - 1. Defer joint filling until concrete has aged at least one (1) month. Do not fill joints until construction traffic has permanently ceased.

- B. Remove dirt, debris, saw cuttings, and sealers from joints; leave contact faces of joints clean and dry.
- C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.11 CONCRETE SURFACE REPAIRS

- A. Comply with ACI 301 Section 5 and as modified below.
- B. Identify those areas requiring repair, and review locations with Architect/Engineer and Contractor's Testing Agency on a case by case basis. Refer to Section "Corrective Work" where it is determined by the Architect/Engineer that the load carrying capacity of the concrete may be jeopardized. If it is determined that only surface repairs are necessary, submit a proposed repair procedure, outlining a description of materials, sequencing, and preparation for review prior to initiating the repairs.
 - 1. Cut out defective concrete down to sound concrete leaving neat, square cut edges.
 - 2. Where reinforcement is exposed by removal of defective concrete, cut around reinforcement to provide a clear space not less than 3/8 inch wide on all sides of the bar.
 - 3. If so directed by the Architect/Engineer, provide 2 inch x 2 inch stainless steel mesh reinforcement securely attached to existing reinforcement with stainless steel wire.
 - 4. Thoroughly saturate the concrete surface to receive the patch for several hours prior to application of patching materials. Remove excess water to obtain saturated, surface dry substrate. Apply primer or scrubcoat of bonding agent according to the manufacturer's instructions.
 - 5. Use the specified polymer patching mortar where a color match to the adjacent concrete is not required.
 - 6. Do not mix more mortar than can be placed in 20 minutes. Apply in layers according to the manufacturer's instructions. Leave all layers except the final layer in a rough condition to receive the succeeding layer.
 - 7. Finish the final layer to match the existing concrete surface in color and texture. Where the concrete surface is to be visible in finished work, add colored aggregates and/or cements as required to provide a mixture which will exactly match the color of the parent

concrete after hardening and curing. Provide test patches in an inconspicuous location to verify the color and texture match before proceeding with remainder of patching.

8. Cure all surface patches in accordance with the repair mortar manufacturer's instructions.
 9. If necessary, rub the surface lightly with a fine carborundum stone at 1 to 5 days age.
- C. Provide repairs with the strength, elasticity and durability equal to the parent material being repaired. Remove and replace patches which become crazed, cracked, sound hollow upon tapping, or, which in the opinion of the Architect/Engineer do not exactly match the surrounding concrete surfaces or otherwise do not satisfy the requirements of the Contract Documents.
- D. When flatness and levelness testing indicates concrete flatwork does not comply with the specified tolerances, grind the surface to adjust flatwork to within tolerance requirements. Perform grinding as soon as possible after the concrete is strong enough to prevent dislodging of the coarse aggregate, preferably within three (3) days.

3.12 CORRECTIVE WORK

- A. Concrete in place will be considered defective if cylinder strength test results do not meet the requirements of ACI 318, Section 5.6. Additional causes for rejecting concrete include, but are not limited to; concrete placed with excessive slump, insufficient air content, beyond specified time limits, with unauthorized retempering, without proper supervision or inspection, with improper curing or protection, or if there is visible evidence of scaling, cracking, voids or excessive deflection.
- B. If, in the Architect/Engineer's opinion, the strength, stiffness or durability of the structure may be compromised, test specimens may be taken from the structure at locations designated by the Architect/Engineer. Obtain and test the specimens in accordance with ASTM C 42 and/or perform petrographic analysis in accordance with ASTM C 856. Test results which indicate non-compliance with the Specifications are cause for rejection. Alternatively, at the Architect/ Engineer's discretion, load tests may be performed and evaluated in accordance with ACI 318, Chapter 20.
- C. Remove and replace concrete that, in the Architect/Engineer's opinion, does not satisfy the performance requirements of this Specification.

- D. Where it is determined that repairs may be attempted, submit a complete repair procedure to the Architect/Engineer for review. Include all necessary information on proposed products, preparation, and sequence of repair including manufacturer's specifications and installation instructions. Do not proceed with repairs until this procedure has been reviewed and accepted by the Architect/Engineer. The repair must account for the strength, stiffness and long term durability of the entire structural element under repair.
- E. The costs of all tests, additional services required of the Architect/Engineer, and for repair or removal and replacement are at the expense of the Contractor.

3.13 GROUTING OF BASE PLATES

- A. Grout Mixture: Use the specified grout mix with the minimum amount of water required to produce a flowable grout. Extend grout with 3/8 inch coarse aggregate for grout placements over 2 inches thick. The proposed grout mix with the 3/8 inch aggregate must be reviewed and approved by the grout manufacturer and the Engineer prior to use.
- B. Mixing: Per approved grout manufacturer's printed instructions. Do not mix more grout than can be placed within 20 minutes.
- C. Preparation:
 - 1. Remove all defective concrete, laitance, dirt, etc. from the concrete surface. Saturate the surface of the concrete thoroughly with clean water for at least 24 hours. Remove free water just prior to placing the grout.
 - 2. Clean, align, and level the base plate into final position and maintain that position during grouting. Bring the concrete and plate to be grouted to a temperature of 65 degrees to 90 degrees F just prior to grouting.
- D. Grouting:
 - 1. Place the grout quickly and continuously to provide complete bearing and avoid air entrapment.
 - 2. After the grout has acquired its initial set, cut off all unconfined, exposed edges, leaving sloping "shoulders." Cure the grout for a minimum of three (3) days by application of a curing compound applied to the exposed shoulders. Maintain temperature above 50 degrees F for this time period.

3.14 FIELD QUALITY CONTROL

- A. Special Inspections: Owner shall engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- C. Inspections:
 - 1. Steel reinforcement placement, including bar size, spacing and cover.
 - 2. Steel reinforcement welding.
 - 3. Headed bolts and studs.
 - 4. Verification of use of required design mixture. Review the delivery tickets of the ready-mix concrete trucks arriving on-site. Notify the contractor if the type of concrete delivered is incorrect, or if will not be able to be placed within the specified time limits. Non-complying concrete is to be rejected by the contractor and removed from the project site.
 - 5. Concrete placement, including conveying and depositing; include performance of formwork during concrete placement.
 - 6. Curing procedures and maintenance of curing temperature.
 - 7. Verification of concrete strength before removal of shores and forms from beams and slabs.
- D. Notify the Contractor immediately if any of the inspected items do not comply with the requirements of the Contract Documents. Any deficiencies noted must be corrected prior to casting the concrete.
- E. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
 - 1. Testing Frequency: Obtain one composite sample taken at point of deposit for each concrete mixture at least once per day and at least once for every 100 cu. yd. of concrete.

- a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
2. Slump: ASTM C 143; Test the first truck each day plus one test at point of placement for each composite sample. Test pumped concrete at the hopper and at the discharge end of the hose at the beginning of each day's pumping operations to determine change in slump. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method, for normal-weight concrete;. Test the first truck plus one test for each composite sample for concrete required to be air entrained.
4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 degrees F and below or 80 degrees F and above, and one test for each composite sample.
5. Density: ASTM C 138, fresh density of structural concrete. Test the first truck and each composite sample.
6. Compression Test Specimens: ASTM C 31.
 - a. Cast and laboratory cure four (4) 6 x 12 inch cylinder specimens for each composite sample.
 - b. Cast and field cure additional cylinder specimens for each composite sample at contractor's option for reducing formwork stripping times or determining when post-tensioning tendons may be stressed.
7. Compressive-Strength Tests: ASTM C 39; test one laboratory-cured specimen at seven (7) days and one set of two specimens at 28 days. Hold one specimen in reserve for testing at 56 days if 28-day tests fall below required strengths.
 - a. Notify the Architect/Engineer and Contractor within 24 hours of testing if the seven (7) day test strength is less than 70 percent of the design strength.
8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
9. Report test results in writing to Architect, Owner, Local Building Official, concrete supplier, and Contractor within 48 hours of testing. Reports of compressive-strength tests

shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive strength, and type of failure for both 7- and 28-day tests.

10. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods as directed by Architect.
 11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 12. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- F. Measure floor and slab flatness and levelness according to ASTM E 1155 within 48 hours of finishing and prior to removal of shoring and formwork.

3.15 PROTECTION OF LIQUID FLOOR TREATMENTS

- A. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

END OF SECTION 033000

SECTION 033540 - CONCRETE DENSIFIER/SEALER TREATMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Densifying, sealing, and hardening treatment for concrete floors.

1.2 ACTION SUBMITTALS

- A. Product Data: Submit product data, including manufacturer's product sheet, for specified products, including, but not limited to, application instructions and indication of VOC content.

1.3 INFORMATIONAL SUBMITTALS

- A. Manufacturer Certification: Provide letter of acceptance from manufacturer of chemical hardener, prior to application of product to areas with sealer or membrane curing agent applied.

1.4 CLOSEOUT SUBMITTALS

- A. Warranty: Submit warranty documents specified in this Section.
- B. Operation and Maintenance Data: Submit operation and maintenance data for installed products in accordance with the General Conditions.
 - 1. Manufacturer's instructions on maintenance renewal of applied treatments.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain densifier, hardener and sealer through one source from single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials in manufacturer's original packaging with identification labels and seals intact.
- B. Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer. Protect concrete slab prior to and after finishing.

1.7 WARRANTY

- A. Manufacturer's Warranty: Warrant installation for a period of 10 years from date of Substantial Completion against dusting from abrasion.

PART 2 - PRODUCTS

2.1 SILICONATE DENSIFIER/SEALER TREATMENT

- A. Basis-of-Design Product: Subject to compliance with requirements, provide one of the following:
 - 1. Seal Hard by L&M Construction Chemicals.
 - 2. Euco Diamond Hard by The Euclid Chemical Co.
 - 3. Ashford Formula by CureCrete Distribution, Inc.
- B. Description: 100 percent active colorless aqueous siliconate solution applied to existing concrete floors where indicated on Drawings at manufacturer's suggested rate and method of application.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Ensure surfaces are clean and free of all contaminants, and any film forming curing compounds or sealers.
- B. Prepare surfaces to receive densifier/sealer treatment in accordance with manufacturer's written instructions.
- C. Protect concrete from staining by other construction activity.

3.2 APPLICATION

- A. Comply with densifier/sealer treatment manufacturer's written application instructions and recommendations.
- B. Apply number of coats and at application rate recommended by densifier/sealer treatment manufacturer using recommended equipment. Remove excess material and allow application to dry and cure as recommended by densifier/sealer treatment manufacturer for applications shown on Drawings.
- C. Remove excess materials and packaging and leave area broom clean.

END OF SECTION 033540

SECTION 035416 - HYDRAULIC CEMENT UNDERLAYMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes polymer-modified, self-leveling, hydraulic cement underlayment for application below interior floor coverings and where existing sloped shower floors and drains have been abandoned in place.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.3 FIELD CONDITIONS

- A. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ventilation, ambient temperature and humidity, and other conditions affecting underlayment performance.
 - 1. Place hydraulic cement underlayments only when ambient temperature and temperature of substrates are between 50 and 80 deg F.

PART 2 - PRODUCTS

2.1 HYDRAULIC CEMENT UNDERLAYMENTS

- A. Hydraulic Cement Underlayment: Polymer-modified, self-leveling, hydraulic cement product that can be applied in minimum uniform thickness of 1/4 inch and that can be feathered at edges to match adjacent floor elevations.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. ARDEX Americas; Ardex V1200.
 - b. Custom Building Products; LevelLite Self-Leveling Underlayment.
 - c. Laticrete International, Inc.; Drytek levelx.
 - d. MAPEI Corporation; Novoplan 2 Plus.
 - e. TEC; H.B. Fuller Construction Products, Inc.; TEC Contractor Grade Self Leveling Underlayment.
 - 2. Cement Binder: ASTM C 150/C 150M, portland cement, or hydraulic or blended hydraulic cement as defined by ASTM C 219.
 - 3. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

- B. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch; or coarse sand as recommended by underlayment manufacturer:
 - 1. Provide aggregate when recommended in writing by underlayment manufacturer for underlayment thickness required.
- C. Water: Potable and at a temperature of not more than 70 deg F.
- D. Primer: Product of underlayment manufacturer recommended in writing for substrate, conditions, and application indicated.
- E. Surface Sealer: Designed to reduce porosity as recommended by manufacturer for type of floor covering to be applied to underlayment.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for conditions affecting performance of the Work.
- B. Proceed with application only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Prepare and clean substrate according to manufacturer's written instructions.
 - 1. Treat nonmoving substrate cracks according to manufacturer's written instructions to prevent cracks from telegraphing (reflecting) through underlayment.
 - 2. Fill substrate voids to prevent underlayment from leaking.
- B. Concrete Substrates: Mechanically remove, according to manufacturer's written instructions, laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants that might impair underlayment bond.
 - 1. Moisture Testing: Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates do not exceed a maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
- C. Adhesion Tests: After substrate preparation, test substrate for adhesion with underlayment according to manufacturer's written instructions.

3.3 APPLICATION

- A. General: Mix and apply underlayment components according to manufacturer's written instructions.
 - 1. Close areas to traffic during underlayment application and for time period after application recommended in writing by manufacturer.

2. Coordinate application of components to provide optimum adhesion to substrate and between coats.
 3. At substrate expansion, isolation, and other moving joints, allow joint of same width to continue through underlayment.
- B. Apply primer over prepared substrate at manufacturer's recommended spreading rate.
- C. Apply underlayment to produce uniform, level surface.
1. Apply a final layer without aggregate to product surface.
 2. Feather edges to match adjacent floor elevations.
- D. Cure underlayment according to manufacturer's written instructions. Prevent contamination during application and curing processes.
- E. Do not install floor coverings over underlayment until after time period recommended in writing by underlayment manufacturer.
- F. Apply surface sealer at rate recommended by manufacturer.
- G. Remove and replace underlayment areas that evidence lack of bond with substrate, including areas that emit a "hollow" sound when tapped.

3.4 PROTECTION

- A. Protect underlayment from concentrated and rolling loads for remainder of construction period.

END OF SECTION 035416

SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Extent of structural steel work is indicated on the Drawings, including schedules, notes and details to show the size and location of members, typical connections, and type of steel required.

1.2 SUBMITTALS

- A. Shop Drawings: Submit Shop Drawings to include all information necessary for fabrication and erection as follows:
 - 1. Details of proposed connections for each member size, steel grade, connection type and design reaction indicated on the drawings. Use standard details where appropriate. Refer to Part 2 - Products "Design" for criteria.
 - 2. Structural calculations prepared and sealed by a qualified engineer registered in the State of Missouri for each connection condition indicated above. Submit calculations for review before preparation of Detail Drawings.
 - 3. Base plate and anchor rod plans showing the location, size, and identification marks of all base plates, screws, bolts, grades of steel and setting elevations.
 - 4. Erection Plans (minimum 1/8" = 1'-0" scale) showing type, size, weight and identification marks of all structural steel members. Include temporary members required for erection, dimensions locating all members relative to column grid lines, elevations of all members, and clear cross references with all other related drawings. Also include the necessary information and instructions regarding field welds and field bolts including type, size and extent of field welds, types of electrodes, joint welding procedures, welding sequence and size and type of field bolts.

5. Detail Drawings showing complete details for the fabrication of all structural steel members and components including, but not limited to: identification marks, dimensions, size, type, weight and grade of steel; requirements for installation of other materials or parts of construction, such as punched or drilled holes, cleats, openings, etc.; type, size and extent of shop and field welds; type of electrodes, joint welding procedures; welding sequences; size and type of shop and field bolts; cleaning requirements prior to painting; type and dry thickness of paint. Use welding symbols used by the American Welding Society.
 6. Drawings and calculations of all shop and field modifications and/or remedial work.
 7. Drawing index sheets, including updated erection plans at the same time that details are submitted.
 8. Contract Document plan drawings may be reproduced by the Contractor with the following provisions:
 - a. Plan drawings may be reproduced only to locate piece marks. The responsibility for producing complete and accurate shop drawings remains with the Contractor.
 - b. The Contractor must remove all title blocks, notes, references, revision marks, and section marks referring to the Contract Document plan drawings.
 - c. Only the plans, modified as described above, may be reproduced. Contract Document detail drawings may not be reproduced, in whole or in part, for any reason.
- B. Product Data: Submit copies of manufacturer's specifications and installation instructions for each proprietary product, including laboratory test reports and such other data as may be required to show compliance with the specifications. Indicate by transmittal form that copies of such data have been distributed to Fabricator/Installer and the Contractor's Testing Laboratory.
1. Certified copies of mill reports covering the chemical and physical properties of the steel.

2. High strength bolts, each type, including nuts and washers.
 3. Unfinished bolts and nuts.
 4. Welding electrodes, each type.
 5. Shop coat primer paint.
- C. Record Surveys: Submit three (3) copies of certified survey(s) by the Contractor's registered professional surveyor as specified in Part 3 – EXECUTION for both the base conditions prior to erection and the final erected steel frame.
- D. Contractor's Shop Testing Reports: Submit directly to the Architect/Engineer with copies to the Contractor, Contractor's Testing Laboratory, and others as indicated. Document all of the certifications, tests, and inspections specified.
- E. Contractor's Testing Laboratory Reports: Submit directly to the Architect/Engineer, with copies to the Contractor and others as indicated. Document all of the certifications, tests, and inspections specified.
- F. Substitutions: Substitutions for the member sizes, type(s) of steel, connection details, or any other modifications proposed by the Contractor will be considered by the Architect/Engineer under the following conditions:
1. The revisions in no case result in additional cost to the Owner. In considering cost savings to the Owner, adequate compensation for the Engineer's review of these substitutions should be considered.
 2. The request is made in writing and accepted prior to the submission of shop drawings.
 3. It is suitably demonstrated that there is a substantial cost advantage or time advantage to the Owner.
 4. Sufficient sketches, engineering calculations by a Structural Engineer registered in the State of Missouri, and other data are submitted to facilitate review by the Architect/Engineer.

1.3 QUALITY ASSURANCE

A. Fabricator's and Erector's Qualifications:

1. Provide written documentation that the Fabricator and Erector have satisfactorily completed work of similar scope and have the necessary skill, equipment, facilities, and capacity to fabricate the structural steel and to perform the erection in accordance with the construction schedule and in compliance with all requirements of the Contract Documents. Submit documentation whether or not the fabrication facility is certified as an AISC Standard for Steel Building Structures facility. Submit documentation whether or not the erector is a Certified Steel Erector (CSE) or Advanced Certified Steel Erector (ACSE) by AISC.

B. References: Except as modified by governing codes and as otherwise specified herein, perform work in accordance with the provisions and recommendations of the latest editions of the following codes and standards:

1. "Specification for Structural Steel Buildings," American Institute of Steel Construction, including Commentary.
2. "Code of Standard Practice for Steel Buildings and Bridges," American Institute of Steel Construction.
3. "Steel Construction Manual," American Institute of Steel Construction.
4. ASTM A6 "General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use."
5. "Recommended Procedure for Identification of High Strength Steels During Fabrication," American Institute of Steel Construction.
6. "Structural Welding Code-Steel" (AWS D1.1), American Welding Society.
7. Specification for Structural Joints Using ASTM A325 or A490 Bolts," Research Council on Structural Connections of the Engineering Foundation (RCSC).
8. "Steel Structures Painting Manual," Volumes 1 and 2, Steel Structures Painting Council (SSPC).

9. "Handbook on Bolt, Nut and Rivet Standards," Industrial Fastener Institute.
10. All pertinent Federal, State and Local codes which govern safety requirements for steel erection, including 29 CFR Part 1926 Subpart R – OSHA regulations for steel erection.
11. Keep copies of these codes and standards available in shop and field.
12. In case of conflict between specified codes and standards, the most stringent requirements govern. In case of conflict between specified codes and standards and project Specifications, project Specifications govern.

C. Pre-Construction Conference:

1. Conduct a meeting prior to the preparation of Shop Drawings to review the detailed requirements for preparing calculations and shop drawings, sequence of submittals, erection tolerances, welding qualifications, inspection procedures, surveys and other similar matters.
2. Responsible representatives from all concerned parties are required to attend the meeting including, but not limited to, the following:
 - a. Owner's representative
 - b. Contractor's superintendent.
 - c. Architect/Engineer.
 - d. Structural steel detailer and/or fabricator.
 - e. Erector.
 - f. Contractor's Testing Laboratory.
 - g. Surveyor.

3. Record and distribute legible meeting minutes within 10 business days to all parties in attendance at the meeting and an additional copy to the Owner's representative.

1.4 TESTING

A. Contractor's Shop Testing, Inspection, and Quality Control:

1. For AISC certified facilities, submit a written program for the proposed fabrication quality control testing and inspection. After review and acceptance of these documents by the Architect/Engineer, perform all shop testing and inspection as specified herein. If the Fabricator's facility is not AISC certified, the Contractor's independent testing laboratory will perform all shop testing and inspection work, and the fabricators will be backcharged a fee to cover the costs of this work.
2. Structural Steel Fabrication Shop Quality Control Program: As a minimum, perform at least the following shop tests and inspections and submit daily reports of the results of all tests. State in each report whether the tested specimens conform to all requirements of the Contract Documents, and specifically note any discrepancies. If the inspections indicate defects in the Work, increase the degree of testing to insure that the full extent of defects in the joint are found and that similar defects are not present in similar joints.
 - a. Provide written documentation that all welders to be employed in the Work hold current AWS certification for the welding procedures that each will perform. If recertification of welders is required, the retesting is the Contractor's responsibility.
 - b. Provide visual and acoustic inspection of all headed anchor studs used on connection plates embedded in concrete. Bend test 20 percent of all studs, a minimum of 1 per plate, at random.
 - c. Visually inspect all fabrication operations, including dimensional and fit-up/alignment and control.
 - d. Visually inspect all plate edges and rolled shape edges for material defects.

- e. Visually inspect material in accordance with AWS D1.1 and ultrasonically test in accordance with ASTM A435 for laminations or other material defects at the following locations:
 - 1) Column flanges and other plate material greater than 1-1/2 inch in thickness in the zone of welded beam/column moment connections. Extend the test area 9 inches above and below each beam flange and/or continuity plate, scanning 100 percent of the test area.
 - 2) Ultrasonically test all built-up girder flange plates 2 inches or more in thickness for laminations. Extend the testing area for the full width of the flanges for 5 feet – 0 inches on each side of the column transfer location.
- f. High Strength Bolted Connections:
 - 1) Check all bolted connections in accordance with the procedures outlined in the RCSC "Specification for Structural Joints Using ASTM A325 or A490 Bolts", latest edition.
- g. Welding Visual Inspection:
 - 1) Inspect all welding operations and welds, including edge preparation, fit-up, preheat, and adherence to welding procedures. Inspect welds prior to shop painting of steel.
 - 2) Measure the weld profiles for 15 percent of the length of each weld, at random.
- h. Welding Magnetic Particle Testing: Test in accordance with ASTM E709 for a minimum of:
 - 1) 20 percent of all shear plate fillet welds at random, final pass only.
 - 2) 20 percent of all continuity plate and bracing gusset plate fillet welds, at random, final pass only.

- 3) 100 percent of tension member fillet welds (i.e., hanger connection plates and other similar connections) for root and final passes.
- 4) 20 percent of length of built-up column member partial penetration and fillet welds at random for root and final passes.
- 5) 100 percent of length of built-up girder member partial penetration and fillet welds for root and final passes.
- i. Welding Ultrasonic Testing: Test in accordance with ASTM E164 and AWS D1.1 for 100 percent of all full penetration welds.
- j. Schedule all work to allow the testing requirements listed above to be completed.

B. Contractor's Testing Laboratory:

- 1. The Contractor's Testing Laboratory will conduct a program of testing and inspection for both shop fabrication and field erection. During shop fabrication, the program will consist of monitoring the structural steel Contractor's quality control and testing program. If the fabrication facility does not meet the AISC Certification Standard for Steel Buildings, the Contractor's Testing Laboratory will perform all shop testing and inspection work listed under "Contractor's Shop Testing and Quality Control". During field erection, the program will consist of all field testing and inspection as specified.
- 2. Shop Quality Control - Contractor's Testing Laboratory: Provide periodic monitoring of the Contractor's quality control testing and inspection program. Include the following as a minimum degree of monitoring:
 - a. Verify all welder qualification, and monitor welding procedures and welding processes.
 - b. Monitor all fabrication operations.
 - c. Verify and monitor all shop testing and inspection, including review of the Contractor's testing and inspection records.

- d. Perform inspection as necessary on those portions of the structural steel not in evidence of complying with the Contract Documents.
- 3. Field Quality Control - Contractor's Testing Laboratory: Perform the following quality control tests and inspections. Interpret test results, submit daily reports, and monthly summary reports.
 - a. Examine the Manufacturer's test certificates for all materials provided. Verify that the lot numbers of the tested material coincides with the lot numbers of the material used on-site.
 - b. Perform full time visual inspection of the field erection of 100 percent of the structural elements.
 - c. Visually inspect all anchor-bolt nut installation and tightening.
 - d. High Strength Bolted Connections:
 - 1) Observe the job site calibration of each size bolted fastener assembly and installation technique in the calibrated tension measuring device. Verify that the proper bolt pretension listed in Table 8.1 of the RCSC "Specification" is achieved and that installation equipment is of sufficient capacity.
 - 2) Routinely monitor field bolting procedures during bolt installation. Verify that all bolts in all connections are brought to a "snug tight" condition with all plies of the connection in firm contact. Verify that bolts in connections identified as either slip-critical or direct tension connections are being additionally tightened by the proper technique(s) determined in the tension testing device described above.
 - 3) Check that all bolted connections are being installed in accordance with the procedures outlined in the RCSC "Specification."
 - e. Welded Connections:

- 1) Obtain qualifications of all welders and verify all welding procedures, including the Contractor's compliance with preheat, weather protection, electrodes, and welding surface preparation requirements.
 - 2) Visually inspect all field welding operations and welds.
- f. Magnetic Particle Testing: Test in accordance with ASTM E709 for a minimum of:
- 1) 20 percent of the length of all field fillet welds, at random, final pass only.
 - 2) 25 percent of the length of all field partial penetration welds, except column splices, at random, root and final passes.
- g. Ultrasonic Testing: Test in accordance with ASTM E164 and AWS D1.1 for a minimum of:
- 1) 100 percent of all field full penetration welds.
 - 2) 100 percent of the length of 25 percent of all field partial penetration column splices, at random.
 - 3) 100 percent column splice welds in moment frames and braced frames.
- h. Schedule all work to allow the testing requirements listed above to be completed.
- i. Testing and inspection do not relieve the Contractor of the responsibility for providing materials and fabrication procedures in compliance with the specified requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Sequence the shipments of material to expedite erection and minimize field handling.
- B. Store materials to protect them from damage, dirt, contamination, and corrosion. Maintain proper lubrication on all high strength bolts. Provide proper drainage. Provide adequate support for stored material to prevent overstressing either new or existing construction.
- C. Handle materials in a manner which protects surfaces and prevents distortion or other damage to either fabricated pieces or existing construction.
- D. Repair or replace damaged materials or structures as directed by Architect/Engineer.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Structural Steel: Newly rolled steel conforming to the following minimum requirements:

Shape/Type	ASTM Grade	Yield Strength (Fy in Ksi)	Post-Consumer and Pre-Consumer Recycled Content
Rolled WF & WT	A992	50	50%, 5%
Plates	A36	36	85%, 10%
Base Plates	A36	36	85%, 10%
Structural Pipe	A53 Grade B	35	50%, 5%
Square/Rectangular HSS	A500 Grade B	46	50%, 5%

Shape/Type	ASTM Grade	Yield Strength (Fy in Ksi)	Post-Consumer and Pre-Consumer Recycled Content
All Other Steel	A36	36	50%, 5%

- B. High Strength Bolts, Nuts, and Washers: ASTM A325 or A490; cold forged with rolled threads. Do not use A325 and A490 bolts of the same diameter. Different grade bolts must vary in diameter by a minimum of 1/4 inch.
- C. Galvanized High Strength Bolts: ASTM A325 Type 1 only. Bolts and nuts to be shipped as assembly from same supplier.
- D. Anchor Rods for Base Plates: ASTM F-1554 Grade 36, 55 or 105 as shown on Contract Documents.
- E. Unfinished Threaded Fasteners: ASTM A307 Grade A.
- F. Headed Studs: ASTM A108, Grades 1010, 1015, 1017, or 1020, cold finished carbon steel.
- G. Galvanizing: Hot dip galvanize steel where indicated as follows:
1. Rolled, Forged, and Pressed Shapes: ASTM A123.
 2. Iron and Steel Hardware: ASTM A153.
 3. Assembled Steel Products: ASTM A123.
 4. Welds subsequent to galvanizing - coat with approved zinc rich primer.
- H. Filler Metal for Welding: Conform to AWS Code D1.1 with addenda and the following requirements:
1. Shielded Metal Arc Welding: AWS A5.1 and A5.5, E70 Series.
 2. Submerged Arc Welding: AWS A5.17 and A5.23.

3. Flux Core Arc Welding: AWS A5.20 and A5.29.
 4. Gas Metal Arc Welding: AWS A5.18 and A5.28.
- I. Torque Control Bolts: ASTM F1852 Type I:
1. LeJeune T.C. Bolts, LeJeune Bolt Company, Burnsville, Minnesota.
 2. Tru-Tension Bolts, Nucor Corporation, St. Joe, Indiana.
- J. Direct Tension Indicators, ASTM F959:
1. "Coronet Load Indicators" by TurnaSure, LLC, Langhorne, PA.
- K. Expansion Anchors: Install in accordance with manufacturer's printed instructions. Use only with prior review and acceptance by the Architect/Engineer for the specific applications indicated. Minimum service load capacity in pounds per anchor:

Diameter	Tension	Shear
3/8"	900	1200
1/2"	1400	2200
5/8"	2500	3300
3/4"	3800	4200
7/8"	4500	6000

- L. Adhesive Anchors: Install in accordance with manufacturers printed instructions. Use only with prior review and acceptance by Architect/Engineer for the specific applications indicated. Subject to compliance with requirements, provide one of the following:
1. HITHY-200 by Hilti.
 2. Power-Fast by Powers Fastening.

3. Ceramic Six by Ramset/Red Head.
- M. Screw Anchors: Install in accordance with manufacturers printed instructions. Use only with prior review and acceptance by Architect/Engineer for the specific applications indicated. Subject to compliance with requirements, provide one of the following:
1. TITEN HD by Simpson Strong-Tie.
 2. KWIK HUS-EZ by Hilti.
- N. Paint-Shop Primer (Steel not exposed to the elements):
1. Series 10-99 Alkyd Primer by Tnemec Co.
 2. Carbocoat 115 by Carboline Co.
- O. Paint-Shop Primer (Steel exposed to the elements):
1. Series 90-97 Urethane Zinc Primer by Tnemec Co.
 2. Carbozinc 859 by Carboline Co.
- P. Galvanizing Repair Paint: SSPC – Paint 20 with dry film containing a minimum of 94 percent zinc dust by weight.
1. Galvilite by ZRC Worldwide.
 2. Approved equal.
- Q. Fiberglass Elements: Pultruded glass fiber reinforced thermoset polymer with Class 1 Fire Rating and the following minimum structural properties.

Compressive Strength Perpendicular to Face:	15,000 psi
Flexural Strength:	10,000 psi
Compressive and Flexural Modulus Perpendicular to Face:	800,000 psi

1. Provide fiberglass shapes as shown on the Contract Documents. Where permanently exposed to weather, coat surfaces with two component UV stabilized urethane, minimum 1.5 mil dry film thickness.
 2. Subject to compliance with requirements, provide material from one of the following:
 - a. Pultex by Creative Pultrusions, Inc.
 - b. Extren by Strongwell, Inc.
 - c. Bedford Shapes by Bedford Reinforced Plastics, Inc.
- R. All Other Materials: Type best suited for the purpose intended. Follow manufacturer's recommendations.

2.2 DESIGN

A. Connections:

1. Design and detail all connections to resist the loads and reactions indicated on the Drawings or specified herein. Use details consistent with the details shown on the Drawings, supplementing where necessary. The details shown on the Drawings are conceptual and do not indicate the required weld sizes or number of bolts unless specifically noted. Use rational engineering design and standard practice in detailing, accounting for all loads and eccentricities in both the connection and the members. Promptly notify the Architect/Engineer of any location where the connection design criteria is not clearly indicated. The design of all connections is subject to the review and acceptance of the Architect/Engineer.
2. A combination of bolts and welds to transmit loads in the same faying surface is not permitted.
3. Use beam-to-column connections which minimize the eccentric loading on the column. Detail and fabricate unrestrained simple beam end connections to minimize end restraint of the beam. Design all parts of such connections (such as welds, bolts, and material) taking eccentricity into account.

2.3 FABRICATION

- A. General: Fabricate and assemble structural work in the shop to the greatest extent possible. Fabricate and assemble in accordance with AISC Specifications and approved Shop Drawings. Before fabrication, straighten materials by methods that will not injure the steel. After punching or working component parts of a member, remove twists or bends.
- B. Identification: Properly mark and match mark each structural steel member for position and identification. Use marks which agree with those shown on the Shop Drawings and Erection Drawings.
- C. Camber: Fabricate all members with the natural camber up. Provide shop-induced camber for beams and girders as indicated.
- D. Embedded Plate Headed Studs: Prepare steel surfaces as recommended by the manufacturer of the headed studs. Shop weld studs, spaced as shown, to the steel member. Use automatic end welding of the headed stud connectors in accordance with the manufacturer's printed instructions.
- E. Built-Up Sections: Provide built-up sections free of warpage and with all axes in true alignment.
- F. Welding:
 - 1. Use gas metal arc welding, shielded metal arc welding, submerged arc welding, or flux core arc welding for all shop welding.
 - 2. Prepare joint welding procedures and a program of welding sequences (for each component and component connections) and submit to the Architect/Engineer for review before any welding is done. Use detailing and procedures that reduce residual stresses to a minimum. Consider the toughness and notch sensitivity of the steel in formulating welding sequences to prevent brittle and premature fracture. After review, follow the welding procedures and sequences without deviation unless specific approval for change is obtained from the Architect/Engineer.

3. Perform all welding in compliance with the AWS "Structural Welding Code" using AWS qualified welders. The Architect/Engineer may require requalification of operators by tests prescribed in the AWS "Standard Qualification Procedures" for changes in welding procedure.
4. Remove paint, grease, loose scale, and foreign matter from the surfaces to be welded. Clean the welds each time the electrode is changed or a new pass is started. Chip clean burned or flame cut edges before depositing welds.
5. Do not begin structural welding until joint elements are bolted or tacked in intimate contact and adjusted to the dimensions shown, with allowance for any weld shrinkage that is expected. Hold component parts of built-up members with clamps or other means to keep parts straight and in close contact. Take precautions to minimize "lock-up" stress and distortion due to heat.
6. Do not exceed a maximum space of 1/4 inch between pieces or members to be butt welded. Bevel pieces or members up to 3/8 inch thickness to form a single or double "Vee" before being welded. Bevel pieces over 3/8 inch thickness to form a double "Vee" whenever possible. Lay and size fillet welds as shown. Measure only the effective portion of fillet welds. Do not exceed a 1/16 inch maximum space between pieces or members to be fillet welded.
7. Welds not otherwise specified are continuous fillet welds. Use the minimum fillet size in accordance with AWS, but not less than 3/16 inch.
8. Weld heavy sections and those having a high degree of restraint with low hydrogen electrodes. Perform intermittent welding, continuous welding and straightening of built-up sections to minimize internal stresses.
9. The same electrode may be used with various thicknesses of plate, but adjust the current used and the number of passes proportionately.
10. Do not weld in a wind unless wind protection is provided. Do not splice members without prior approval or review by the Architect/Engineer.
11. After being deposited, brush welds with wire brushes. Make welds which exhibit uniform section, smoothness of welded metal, feather edges without undercuts or overlays and which are free of porosity and clinkers. Visual inspection of the

edges and ends of fillets and butt joint welds must indicate good fusion, with penetration into the base metal. Cut out and replace defective welds.

G. Cutting:

1. Perform manual thermal cutting only with a mechanically guided torch, except as permitted below:
 - a. Gas cut edges which are not to be welded and which will be free of substantial stresses (as determined by the Architect/Engineer) may be cut manually with an unguided torch provided that specified AISC edge distances to holes are maintained.
 - b. Gas cut edges which will be subjected to substantial stress (over 1/2 the allowable stress, as determined by the Architect/Engineer), or which are to be welded may be cut manually with an unguided torch to a line not within 1/8 inch of the finished dimension. Complete the final removal of material by chipping or grinding to produce a surface quality equal to that of the base metal edges.
2. Manual thermally cut holes for bolted connections are not permitted; components prepared in this manner will be rejected.
3. Shape all re-entrant corners notch-free to a radius of at least 1/2 inch.
4. Cut only those openings of the size and location shown on the reviewed Shop Drawings.

H. Punching, Drilling, and Reaming:

1. Material may be punched $1/16$ inch larger than the nominal diameter of the bolts. Wherever the thickness of metal is greater than $7/8$ inch or is greater than the diameter of the bolts plus $1/8$ inch, drill or subpunch holes and ream. The diameter for subpunched holes shall be $1/16$ inch smaller than nominal diameter of bolt accommodated. Locate finished holes to insure passage of bolts through assembled materials without drifting. Enlarge holes to receive bolts by reaming. Remove burrs caused by punching or reaming before assembly of bolted joints or members.
2. Drill or punch holes at right angles to the surface of the metal. Do not make or enlarge holes by burning. Clean-cut holes without torn or ragged edges.
3. Punch and drill steel for attachment of other materials indicated on the Drawings or noted in the Specifications to be attached to the steel. Use suitable templates for proper location of this work. Provide slotted holes for adjustment where indicated.

I. Finished Ends: Finish all column ends where loads are transferred by contact bearing.

J. High Strength Bolted Connections:

1. Use bolts of a length that will extend at least $1/4$ inch beyond the nuts in the completed connection. Enter bolts into the holes without damaging the thread.
2. Provide a calibrated bolt tension indicating device at the jobsite. Use the device to confirm the suitability both of the component parts of the fastener assembly and of the selected installation techniques. Tighten representative samples of each bolt type and size in the device to demonstrate both proper snug tight conditions and the additional tightening necessary to develop the bolt pretension prescribed in Table 8.1 of the RCSC "Specification." Use the device to insure that the installation wrenches and pneumatic supply are of adequate capacity.
3. Correct poor matching of holes by drilling hole to the next larger bolt size and using the larger size bolt, if approved by the Architect/Engineer.

4. Assemble joints without the use of separate erection bolts.
5. Install bolts using powered impact wrenches of sufficient capacity and with an adequate supply of air.
6. Bring all plies of the connection into firm contact by tightening all bolts to a snug tight condition. Progress systematically from the most rigid portion of the joint out to the joint free edges. Retighten any bolts, which may have loosened during the assembly process. Protect bolt heads and nuts during assembly and tightening.
7. Tighten bolts in connections identified as tension or slip-critical connections to the pretension levels specified in Table 8.1 of the RCSC "Specification."

2.4 SUPPLEMENTAL FRAMING

- A. Provide supplemental framing at all openings as shown on the Drawings and at all suspended loads.
- B. Where open web joists are used, provide additional framing to transfer loads from the supplemental framing and suspended loads to joist panel points. Coordinate with the steel joist Contractor and provide them with sufficient information to enable them to incorporate shop-welded connections to panel points on their Shop Drawings. Where the information is not provided to the steel joist Contractor, supply and install the necessary connections.

2.5 SHOP PAINTING

- A. Cleaning and Preparation:
 1. Painted Steel:
 - a. Clean steel not exposed to the elements that is specified to be painted in accordance with SSPC-SP3. Steel not exposed to the elements is contained within the building envelope.
 - b. Clean steel exposed to the elements that is to be painted in accordance with SSPC-SP6. Connections are to be included.

2. Unpainted Steel:

- a. Clean unpainted steel to receive fireproofing to remove all oil, grease, loose mill scale, salt, dirt, and any other substance that impairs proper adhesion of the fireproofing.
- b. Clean all other unpainted steel to remove oil and grease with solvent cleaners and remove dirt and other foreign materials by thoroughly sweeping with fiber brushes.

B. Surfaces to be Painted:

1. Steel and connections not receiving spray-on fireproofing are painted. Examples include but are not limited to:
 - a. Steel that is exposed to view inside the building.
 - b. Exterior wall bracing and masonry supports.
 - c. Wall girts and secondary steel members.
2. Steel that is exposed to the elements and related connections are either painted or hot dipped galvanized.
3. Do not paint the following surfaces:
 - a. Top surface of beams to receive steel deck and/or shear connectors fastened by welding.
 - b. Contact surfaces of high strength slip-critical or tension bolted connections.
 - c. Steel to be encased in concrete. Extend priming of partially embedded members to a depth of 2 inches.
 - d. Surfaces within 2 inches of field welds.
 - e. Machine finished surfaces (e.g., bearing surfaces of columns and column base plates).

4. Lintels in exterior walls are to be hot-dipped galvanized.

C. Surfaces to be Painted:

1. All steel surfaces, except as follows:
 - a. Top surface of beams to receive steel deck and/or shear connectors fastened by welding.
 - b. Contact surfaces of high strength slip-critical or tension bolted connections.
 - c. Steel to be encased in concrete.
 - d. Surfaces within 2 inches of field welds.
 - e. Machine finished surfaces (e.g., bearing surfaces of columns and column base plates).
2. Lintels in exterior walls are to be hot-dipped galvanized.

D. Method and Rate of Paint Application:

1. Steel Not Exposed To The Elements:
 - a. Apply one prime coat of paint to dry, clean surfaces by brush, spray, or roller. Do not allow paint to run or sag.
 - b. Do not exceed a coverage rate per coat of 400 square feet per gallon providing a minimum dry film thickness of 2 mils.
 - c. If, for any reason, any surface to be field welded is painted, remove the paint completely to within the stated limits before field welding. If high strength slip-critical bolted connection contact surfaces are painted, the allowable load per bolt used in design must be in accordance with the RCSC "Specification" value for the paint type used. If any machine finished surface is painted, remove the paint completely, and touch up the specified finish, if required, before shipping or erection.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Employ the services of a Registered Surveyor to establish permanent bench marks and field verify the location and elevation of the following:
 - 1. Anchor rods – verify both location and extension above substrate.
 - 2. Concrete or masonry on which structural steel is to be placed.
 - 3. Elevation and levelness of steel leveling plates set on grout bed.
- B. Provide written results of survey noted above to Owner's Representative and Architect/Engineer prior to steel erection. List every out of tolerance condition and proposed method of correction for each condition. Do not commence erection until out of tolerance conditions are corrected to satisfaction of erector and Architect/Engineer.
- C. Examine the substrates, adjoining construction, and conditions under which work is to be installed. Do not proceed with the work until unsatisfactory conditions detrimental to the proper and timely completion of the work have been corrected.
- D. The design, strength, safety, and adequacy of all temporary bracing and methods of construction are the responsibility of the Contractor. This responsibility includes the safety and stability of the structural steel work at all stages of erection, until the permanent lateral load resisting system of the structure becomes fully effective. No action by the Architect/Engineer will eliminate, lessen or restrict this responsibility in any manner.

3.2 ERECTION

- A. Set base plates and bearing plates level to correct elevations. Support plates temporarily on steel wedges, shims, leveling devices, or as shown on Drawings, until corresponding supported member has been positioned, plumbed, and anchor-bolted. Leave protruding leveling devices in place until after the grout has been placed and has attained required

strength; then cut off flush with the top or edges of the base plate, or both, except as otherwise noted.

- B. Align, level, and adjust all members accurately prior to final fastening. Clean all bearing surfaces and surfaces that will be in permanent contact prior to final assembly of the members. Use drift pins only to bring the parts together. Do not use drift pins in a manner that distorts or damages the metal.
- C. As erection progresses, securely connect the work to safely resist all dead load, wind load and erection forces. Introduce temporary bracing wherever necessary to safely resist all loads to which the structure may be subjected, including erection equipment and its operation. Leave the temporary bracing in place for as long as is required for safety.
- D. Thermal cutting in the field is not permitted without written permission from the Architect/ Engineer. When permitted, execute in accordance with the requirements herein specified.
- E. Install sliding connections of the design shown. Exercise particular care in erection to ensure the proper functioning of these connections as sliding joints.
- F. Splice members only where shown or specified.
- G. Provide all temporary supports, flooring, planking, and scaffolding necessary in conjunction with the erection of the structural steel, or the support of erection equipment, as a part of the erection work. Use temporary floors as required by Federal, State, and Municipal Laws and governing safety regulations.
- H. Field Welding:
 - 1. Use shielded metal arc welding or flux core arc welding for all field welding.
 - 2. Provide safe and substantial work platforms at the proper height to permit the best possible field welding technique. Provide temporary enclosures, shielding, etc. to protect the welding operators and the joints to be welded against the elements during welding operations.

3. Perform welding in accordance with the requirements of Fabrication - Welding - in Part 2 - Products.

I. Installation of High Strength Bolts:

1. Provide safe and substantial work platforms for bolting crews.
2. Assign an identification symbol or mark to each bolting crew working on the project. Use this identification on each joint completed.
3. Perform bolting in accordance with the requirements of Fabrication - High Strength Bolted Connections - in Part 2 - Products.

- J. After erection, remove all loose mill scale, loose rust, oil, grease, or other bond inhibiting foreign substances from steel to be fireproofed.

3.3 FABRICATION AND ERECTION TOLERANCES

- A. Unless otherwise noted, level and plumb individual members of the structure to an accuracy of 1 in 500, and erect structural steel to within the tolerances specified in the AISC "Code of Standard Practice." Base all leveling and plumbing on the mean operating temperature of the structure. Make allowances for the differences in temperature at time of erection and the mean temperature at which the structure will be at completion and in service. Base all measurements relating to tolerances on the theoretical centerline of the columns. In addition to the requirements listed above, plumb and align columns as follows:

1. Columns Adjacent to Elevator Shafts: Accurate to 1:1000; not to exceed 1 inch for their full height.
2. All Exterior Columns: Within 1 inch of the theoretical centerline either toward or away from the building.
3. The Centerline of any two (2) Adjacent Exterior Columns: Within 3/4 inch of each other either toward or away from the building.

4. All Intermediate Exterior Columns: Within 3/4 inch of a line between the corner columns.

3.4 FIELD SURVEYS

- A. Establish bench marks and survey the base structure for dimensional extremes before proceeding with erection to determine the range of any required compensating adjustments. Make an accurate survey of actual column locations, including vertical elevations, immediately upon the completion of every tier of steel. Promptly submit report to the Owner's Representative and Architect/Engineer. Include resurvey of tier below. Should column locations vary beyond the allowable tolerances, take necessary corrective measures, and modify details and/or procedures as required. Survey the final erected structural steel frame prior to the application of fireproofing and/or building enclosure materials, and report any discrepancies from Contract requirements to the Owner's Representative and Architect/Engineer.

3.5 CORRECTIVE WORK

- A. Report to the Architect/Engineer any structural steel members or assemblages having fabrication or erection errors, or errors or deformations preventing proper assembly and fitting of parts.
- B. Submit Drawings to the Architect/Engineer showing the reasons for and details of proposed corrective work. Perform the corrective work only after the Architect/Engineer has reviewed and accepted the corrective procedures. Perform any additional tests, at the Contractor's expense, that may be necessary to show compliance of corrected work.

3.6 FIELD TOUCH-UP PAINTING

- A. After erection, touch-up all exposed metal surfaces where the shop coat of paint is missing or has been damaged. Use the same type of paint as approved for the shop coat.

- B. After erection, wire brush and clean all areas where galvanized coating has been damaged or is missing. Touch up areas with galvanizing repair paint in accordance with manufacturer's printed instructions.
- C. Thoroughly clean all areas to be painted to remove rust, dirt and weld slag prior to touch-up.
- D. Extend the touch-up paint a minimum of 2 inches onto the undamaged finish.
- E. Uniformly apply the paint to dry surfaces to a dry film thickness of no less than 2 mils (3 mils for steel exposed to the elements).

END OF SECTION 051200

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Steel tube reinforcement for low partitions.
 - 2. Steel framing and supports for mechanical and electrical equipment.
 - 3. Steel framing and supports for applications where framing and supports are not specified in other Sections.
 - 4. Loose bearing and leveling plates for applications where they are not specified in other Sections.
 - 5. Miscellaneous steel trim including.
- B. Products furnished, but not installed, under this Section include the following:
 - 1. Loose steel lintels.
 - 2. Anchor bolts, steel pipe sleeves, 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 not specified in other Sections.

1.2 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 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.

1.3 ACTION SUBMITTALS

- A. Shop Drawings: Show fabrication and installation details for metal fabrications.
 - 1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
 - 2. Provide templates for anchors and bolts specified for installation under other Sections.
 - 3. For products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

4. Provide Shop Drawings for the following:
 - a. Steel tube reinforcement for low partitions.
 - b. Steel framing and supports for mechanical and electrical equipment.
 - c. Steel framing and supports for applications where framing and supports are not specified in other Sections.
 - d. Loose steel lintels.

1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

1.5 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. 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. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), 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 A 36/A 36M.
- C. Steel Tubing: ASTM A 500/A 500M, cold-formed steel tubing.
- D. Steel Pipe: ASTM A 53/A 53M, standard weight, unless otherwise indicated.

2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, at exterior walls. Provide stainless-steel fasteners for fastening aluminum. Select fasteners for type, grade, and class required.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563; and, where indicated, flat washers.
- C. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 325, Type 3; with hex nuts, ASTM A 563, Grade C3 (ASTM A 563M, Class 8S3); and, where indicated, flat washers.
- D. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, nuts and, where indicated, flat washers; ASTM F 593 for bolts and ASTM F 594 for nuts, Alloy Group 1.
- E. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563; and, where indicated, flat washers.
 - 1. Provide hot-dip or mechanically deposited, zinc-coated anchor bolts where item being fastened is indicated to be galvanized.
- F. Eyebolts: ASTM A 489.
- G. Machine Screws: ASME B18.6.3 (ASME B18.6.7M).
- H. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).
- I. Wood Screws: Flat head, ASME B18.6.1.
- J. Plain Washers: Round, ASME B18.22.1 (ASME B18.22M).
- K. Lock Washers: Helical, spring type, ASME B18.21.1 (ASME B18.21.2M).
- L. Anchors, General: 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 E 488, conducted by a qualified independent testing agency.
- M. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.

- N. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.
 - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941, 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 F 593, and nuts, ASTM F 594.

2.4 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. 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.
- C. Zinc-Rich Primer: Provide zinc-rich primer, complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with topcoat, at all exterior steel framing and support elements.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Benjamin Moore & Co.; Epoxy Zinc-Rich Primer CM18/19.
 - b. Carboline Company; Carbozinc 621.
 - c. PPG Architectural Finishes, Inc.; Aquapon Zinc-Rich Primer 97-670.
 - d. Sherwin-Williams Company (The); Corothane I GalvaPac Zinc Primer.
 - e. Tnemec Company, Inc.; Tneme-Zinc 90-97.
- 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 for regalvanizing welds in steel, complying with SSPC-Paint 20.
- F. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.
- G. 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.

2.5 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, 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 true to line and level 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 where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts, unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that will be 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. Cut, drill, and tap units to receive hardware, hangers, and similar items.
 - 1. Furnish inserts if units are installed after concrete is placed.
- C. Galvanize miscellaneous framing and supports where indicated.
- D. Prime miscellaneous framing and supports with zinc-rich primer where indicated.

2.7 LOOSE STEEL LINTELS

- A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.
- B. Lintel Schedule: Furnish lintels for installation in Division 04 sections not furnished in Division 05 Section "Structural Steel Framing". Provide quantity and sizes indicated on Drawings or as indicated below if not indicated on Drawings.
 - 1. Maximum Masonry Opening: 3 feet
 - a. 4-Inch Veneer: One L 4 x 4 x 5/16
 - b. 4-Inch Walls: One L 3-1/2 x 3-1/2 x 1/4
 - c. 6-Inch Walls: Two L 3 x 2-1/2 x 1/4
 - d. 8-inch Walls: Two L 3-1/2 x 3-1/2 x 1/4
 - e. 10-inch Walls: Three L 3 x 3 x 1/4
 - f. 12-inch Walls: Three L 3-1/2 x 3-1/2 x 1/4
 - 2. Maximum Masonry Opening: 4 feet
 - a. 4-Inch Veneer: One L 4 x 4 x 15/16
 - b. 4-Inch Walls: One L 4 x 3-1/2 x 1/4
 - c. 6-Inch Walls: Two L 3 x 2-1/2 x 1/4
 - d. 8-inch Walls: Two L 4 x 3-1/2 x 1/4
 - e. 10-inch Walls: Three L 4 x 3 x 1/4
 - f. 12-inch Walls: Three L 4 x 3-1/2 x 1/4
 - 3. Maximum Masonry Opening: 5 feet
 - a. 4-Inch Veneer: One L 4 x 4 x 15/16
 - b. 4-Inch Walls: One L 4 x 3-1/2 x 1/4

- c. 6-Inch Walls: Two L 3-1/2 x 2-1/2 x 1/4
 - d. 8-inch Walls: Two L 4 x 3-1/2 x 1/4
 - e. 10-inch Walls: Three L 4 x 3 x 1/4
 - f. 12-inch Walls: Three L 4 x 3-1/2 x 1/4
- 4. Prime loose steel lintels located in exterior wall assemblies with zinc-rich primer.
 - 5. Where lintels occur in exterior wall assemblies, provide minimum lintel thickness of 5/16-inch.
 - 6. Set lintels with long leg vertical and with 8-inches of bearing each end.

2.8 LOOSE BEARING AND LEVELING PLATES

- A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.
- B. Galvanize plates after fabrication.

2.9 PRIME PLATES WITH ZINC-RICH PRIMER. 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 not less than two integrally welded steel strap anchors for embedding in concrete.

2.10 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.

2.11 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.

- C. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.12 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:
 - 1. ASTM A 123/A 123M, for galvanizing steel and iron products.
 - 2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.
 - 3. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
- B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.
- C. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
- D. Preparation for Shop Priming: Prepare surfaces to comply with requirements indicated below:
 - 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 099600 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 4. Other Items: SSPC-SP 3, "Power Tool Cleaning."
- E. 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.

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 bolts, 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.

3.2 INSTALLING 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.
- B. 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.
- C. Install pipe columns on concrete footings with grouted base plates. Position and grout column base plates as specified in "Installing Bearing and Leveling Plates" Article.
 - 1. Grout base plates of columns supporting steel girders after girders are installed and leveled.

3.3 INSTALLING 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 nonshrink grout.

1. Use nonshrink grout, either metallic or nonmetallic, in concealed locations where not exposed to moisture; use nonshrink, nonmetallic grout in exposed locations, unless otherwise indicated.
2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.4 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 1. 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 Division 09 painting Sections.
- C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 055000

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Framing with dimension lumber.
 - 2. Framing with engineered wood products.
 - 3. Wood blocking and nailers.
 - 4. Plywood backing panels.

1.2 DEFINITIONS

- A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal size or greater but less than 5 inches nominal size in least dimension.
- C. Exposed Framing: Framing not concealed by other construction.
- D. Timber: Lumber of 5 inches nominal size or greater in least dimension.

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.
 - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
3. 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.
4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

B. Fastener Patterns: Full-size templates for fasteners in exposed framing.

1.4 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.
- B. Evaluation Reports: For the following, from ICC-ES:
 1. Wood-preservative-treated wood.
 2. Fire-retardant-treated wood.
 3. Engineered wood products.
 4. Power-driven fasteners.
 5. Post-installed anchors.
 6. Metal framing anchors.

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 products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products 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, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal thickness or less; 19 percent for more than 2-inch nominal thickness 15 percent for 2-inch nominal thickness or less; no limit for more than 2-inch nominal thickness 19 percent for 2-inch nominal thickness or less; no limit for more than 2-inch nominal thickness unless otherwise indicated.
- C. Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
 - 1. Allowable design stresses, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWWPA 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. Do not use inorganic boron (SBX) for sill plates, decks, or exposed exterior applications.
 - 2. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat items indicated on Drawings, and the following:
 - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - 2. Wood sills, blocking, and similar concealed members in contact with masonry or concrete.
 - 3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
 - 4. Wood framing members that are less than 18 inches above the ground in crawlspaces or unexcavated areas.
 - 5. Wood floor plates that are installed over concrete slabs-on-grade.

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 E 84, 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.
 - 1. Treatment shall not promote corrosion of metal fasteners.
 - 2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
 - 3. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D 5664 and design value adjustment factors shall be calculated according to ASTM D 6841.
- C. Kiln-dry lumber after treatment to maximum moisture content of 19 percent.
- D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
- E. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not bleed through, contain colorants, or otherwise adversely affect finishes.
- F. Application: Treat all rough carpentry unless otherwise indicated.
 - 1. Concealed blocking.
 - 2. Framing for non-load-bearing partitions.
 - 3. Plywood backing panels.

2.4 DIMENSION LUMBER FRAMING

A. Non-Load-Bearing Interior Partitions: Construction or No. 2 grade.

1. Application: Interior partitions not indicated as load bearing.
2. Species:
 - a. Southern pine or mixed southern pine; SPIB.

B. Load-Bearing Partitions: No. 2 Dense grade.

1. Application: Interior load-bearing partitions.
2. Species:
 - a. Southern pine; SPIB.

2.5 ENGINEERED WOOD PRODUCTS

A. Composite Wood Products: Products shall be made without urea formaldehyde.

B. Composite Wood Products: Products shall comply with the testing and product 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."

C. Composite Wood Products: Products shall be made using ultra-low-emitting formaldehyde resins as defined in the California Air Resources Board's "Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products" or shall be made with no added formaldehyde.

D. Source Limitations: Obtain each type of engineered wood product from single source from a single manufacturer.

- E. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.
 - 1. Extreme Fiber Stress in Bending, Edgewise: 2600 psi for 12-inch nominal- depth members.
 - 2. Modulus of Elasticity, Edgewise: 2,000,000 psi.

2.6 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.
 - 3. Furring.
- B. Dimension Lumber Items: Construction or No. 2 grade lumber of the following species:
 - 1. Mixed southern pine or southern pine; SPIB.
- C. 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.
- D. 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.
- E. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.7 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: Plywood, DOC PS 1, Exterior, A-C, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.8 FASTENERS

- A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
 - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M and ASTM A658/A653M, G185 coating designation or heavier.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- D. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01, ICC-ES AC58, ICC-ES AC193, or ICC-ES AC308 as appropriate for the substrate.
 - 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

2.9 MISCELLANEOUS MATERIALS

- A. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to suit width of sill members indicated.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- C. 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 nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- D. 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.
- E. Install sill sealer gasket to form continuous seal between sill plates and foundation walls.
- F. Do not splice structural members between supports unless otherwise indicated.
- G. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
 - 1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.
- H. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:
 - 1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.

2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal thickness.
 3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. and to solidly fill space below partitions.
 4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet o.c.
- I. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- J. Comply with AWP A M4 for applying field treatment to cut surfaces of preservative-treated lumber.
1. Use inorganic boron for items that are continuously protected from liquid water.
 2. Use copper naphthenate for items not continuously protected from liquid water.
- K. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).
 2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
 3. ICC-ES evaluation report for fastener.
- L. Use steel common 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 between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

- M. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
 - 1. Comply with approved fastener patterns where applicable.
 - 2. Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for 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.

3.3 WOOD FURRING INSTALLATION

- A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
- B. Furring to Receive Gypsum Board: Install 1-by-2-inch nominal- size furring vertically at 16 inches o.c.

3.4 WALL AND PARTITION FRAMING INSTALLATION

- A. General: Provide single bottom plate and double top plates using members of 2-inch nominal thickness whose widths equal that of studs, except single top plate may be used for non-load-bearing partitions and for load-bearing partitions where framing members bearing on partition are located directly over studs. Fasten plates to supporting construction unless otherwise indicated.

1. For interior partitions and walls, provide 2-by-4-inch nominal- size wood studs spaced 16 inches o.c. unless otherwise indicated.
 2. Provide continuous horizontal blocking at mid height of partitions more than 96 inches high, using members of 2-inch nominal thickness and of same width as wall or partitions.
- B. Construct corners and intersections with three or more studs.
- C. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Support headers on jamb studs.
1. For non-load-bearing partitions, provide double-jamb studs and headers not less than 4-inch nominal depth for openings 48 inches and less in width, 6-inch nominal depth for openings 48 to 72 inches in width, 8-inch nominal depth for openings 72 to 120 inches in width, and not less than 10-inch nominal depth for openings 10 to 12 feet in width.
 2. For load-bearing walls, provide double-jamb studs for openings 60 inches and less in width, and triple-jamb studs for wider openings unless noted otherwise. Provide headers of depth indicated.

3.5 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet enough that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

SECTION 064023 - INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior architectural woodwork items including, but not limited to, the following:
 - a. Plastic-laminate-faced architectural cabinets.
 - b. Plastic-laminate-clad countertops.
 - c. Solid surfacing countertops, including backsplashes, end splashes, apron fronts, sinks and desks.
 - d. Interior ornamental woodwork.
 - e. Interior standing and running trim, including closet and utility shelving.
 - f. Interior frames and jambs.
 - g. Prefabricated wardrobes.
2. Wood furring, blocking, shims, and hanging strips for installing architectural wood cabinets unless concealed within other construction before cabinet installation.
3. Shop finishing of interior architectural woodwork.

1.2 DEFINITIONS

- A. Interior Architectural Woodwork: Includes wood furring, blocking, shims, and hanging strips for installing woodwork items unless concealed within other construction before woodwork installation and includes items referred to as "millwork."
- B. AWI: Architectural Woodwork Institute.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product, including high-pressure decorative laminate, countertop materials, sinks, adhesive for bonding plastic laminate, cabinet hardware and accessories, and finishing materials and processes.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
1. Show details full size.
 2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.

3. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets electrical switches and outlets, and other items installed in interior architectural woodwork items including countertops.
4. For countertops. Show materials, finishes, edge profiles, and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.
 - a. Show locations and details of joints.
 - b. Show direction of directional pattern, if any.
5. Show locations of lighting luminaires, their control locations and electrical wiring connections point(s).
6. Show veneer leaves with dimensions, grain direction, exposed face, and identification numbers indicating the flitch and sequence within the flitch for each leaf.
7. Apply AWI Quality Certification Program label to Shop Drawings.

C. Samples for Verification:

1. Lumber for Transparent Finish: Not less than 5 inches wide by 12 inches long, for each species and cut, finished on one side and one edge.
2. Veneer-Faced Panel Products for Transparent Finish: 12 by 24 inches, for each species and cut. Include at least one face-veneer seam and finish as specified.
3. Lumber and Panel Products with Shop-Applied Opaque Finish: 5 inches wide by 12 inches long for lumber and 12 by 12 inches for panels, for each finish system and color, with exposed surface finished.
4. Veneer Leaves: Representative of and selected from flitches to be used for interior ornamental woodwork.
5. Plastic Laminates for Cabinets: 8 by 10 inches, for each type, color, pattern, and surface finish.
6. Wood-Grain Plastic Laminates for Cabinets: 12 by 24 inches, for each type, pattern and surface finish.
7. Thermoset Decorative Panels: 8 by 10 inches, for each color, pattern, and surface finish.
8. Countertops:
 - a. Countertop material, 6 inches square.
 - b. Wood trim, 8 inches long.
9. Exposed Cabinet Hardware and Accessories: One unit for each type and finish.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and Fabricator.

- B. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Manual Data for Solid Surfacing Countertops: 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 products similar to those required for this Project and whose products have a record of successful in-service performance. Shop is a certified participant in AWI's Quality Certification Program. Installer Qualifications: Certified participant in AWI's Quality Certification Program.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver interior architectural woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If cabinets must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.8 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 between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 25 and 55 percent during the remainder of the construction period.
- B. Field Measurements: Where interior architectural woodwork items are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Locate concealed framing, blocking, and reinforcements that support interior architectural woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.
 - 2. Verify dimensions of countertops by field measurements before countertop fabrication is complete.
- C. Established Dimensions: Where interior architectural woodwork items are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.9 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that countertops can be supported and installed as indicated.
 - 1. Coordinate locations of utilities that will penetrate countertops or backsplashes.

PART 2 - PRODUCTS

2.1 ARCHITECTURAL WOODWORK, GENERAL

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards, Edition 2" published by AWI for grades of architectural woodwork indicated for construction, finishes, installation, and other requirements.
 - 1. Provide labels and certificates from AWI certification program indicating that woodwork, including installation, complies with requirements of grades specified.
 - 2. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with those selections and requirements in addition to the quality standard.

2.2 WOOD CABINETS FOR TRANSPARENT FINISH

- A. Refer to Division 12 Section "Residential Casework."

2.3 PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS

- A. Grade: Custom.
- B. Type of Construction: Frameless.
- C. Cabinet, Door, and Drawer Front Interface Style: Flush overlay.
- D. Reveal Dimension: 1/2 inch.
- E. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by woodwork quality standard.
 - 1. Basis-of-Design Products: Subject to compliance with requirements, provide products indicated in Finish Schedule or Finish Legend on Drawings, or one of the following which matches:
 - a. Formica.
 - b. Wilsonart

c. Pionite

F. Laminate Cladding for Exposed Surfaces:

1. Horizontal Surfaces: Grade HGS.
2. Vertical Surfaces: Grade HGS.
3. Edges: PVC edge banding, 0.12 inch thick, matching laminate in color, pattern, and finish.
4. Pattern Direction: Vertically for drawer fronts, doors, and fixed panels or as indicated.

G. Materials for Semi-Exposed Surfaces:

1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, NEMA LD 3, Grade VGS.
 - a. Edges of Plastic-Laminate Shelves: PVC edge banding, 0.12 inch thick, matching laminate in color, pattern, and finish.
 - b. For semi-exposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, NEMA LD 3, Grade VGS.
2. Drawer Sides and Backs: Thermoset decorative panels with PVC or polyester edge banding.
3. Drawer Bottoms: Thermoset decorative panels.

H. Dust Panels: 1/4-inch plywood or tempered hardboard above compartments and drawers unless located directly under tops.

I. Concealed Backs of Panels with Exposed Plastic-Laminate Surfaces: High-pressure decorative laminate, NEMA LD 3, Grade BKL.

J. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.

1. Join subfronts, backs, and sides with glued rabbeted joints supplemented by mechanical fasteners or glued dovetail joints.

K. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:

1. As indicated by laminate manufacturer's designations.

2.4 PLASTIC-LAMINATE-CLAD COUNTERTOPS

A. Grade: Custom.

B. High-Pressure Decorative Laminate: NEMA LD 3, Grade HGS.

1. Basis-of-Design Products: Subject to compliance with requirements, provide products indicated in the Finish Legend on Drawings.
- C. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
 1. As indicated by manufacturer's designations.
- D. Edge Treatment: Same as laminate cladding on horizontal surfaces or lumber edge for transparent finish matching wood species and cut on cabinet surfaces.
- E. Core Material: Particleboard.
- F. Core Material at Sinks: Particleboard made with exterior glue.
- G. Core Thickness: As indicated on Drawings.
 1. Build up countertop thickness to 1-1/2 inches at front, back, and ends with additional layers of core material laminated to top.
- H. Backer Sheet: Provide plastic-laminate backer sheet, NEMA LD 3, Grade BKL, on underside of countertop substrate.

2.5 SOLID SURFACE COUNTERTOP AND WALL MATERIALS

- A. Solid Surface Material: Homogeneous-filled plastic resin complying with ICPA SS-1.
 1. Basis-of-Design Products: Subject to compliance with requirements, provide products indicated in the Finish Legend on Drawings.
 2. Integral Sink Bowls: Comply with CSA B45.5/IAPMO Z124.
 3. Colors and Patterns: As indicated by manufacturer's designations in Finish Legend.
- B. Particleboard: ANSI A208.1, Grade M-2-Exterior Glue.
- C. Plywood: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, and touch sanded.

2.6 INTERIOR ORNAMENTAL WORK FOR TRANSPARENT FINISH

- A. Interior ornamental work for transparent finish includes the following:
 1. Columns.
 2. Nurse Stations.
 3. Other items noted.

- B. Grade: Custom.
- C. Wood Species and Cut:
 - 1. Species: Maple.
 - 2. Cut: Quarter cut/quarter sawn.

2.7 INTERIOR ORNAMENTAL WORK FOR OPAQUE FINISH

- A. Interior ornamental work for opaque finish includes the following:
 - 1. Columns.
 - 2. Nurse Stations.
 - 3. Other items noted.
- B. Grade: Custom.
- C. Wood Species: Any closed-grain hardwood.

2.8 INTERIOR STANDING AND RUNNING TRIM FOR TRANSPARENT FINISH

- A. Grade: Custom.
- B. Wood Species and Cut:
 - 1. Species: Maple.
 - 2. Cut: Quarter cut/quarter sawn.
- C. For trim items other than base wider than available lumber, use veneered construction. Do not glue for width.
- D. For base wider than available lumber, glue for width. Do not use veneered construction.

2.9 INTERIOR STANDING AND RUNNING TRIM FOR OPAQUE FINISH

- A. Grade: Custom.
- B. Wood Species: Any closed-grain hardwood.

2.10 CLOSET AND UTILITY SHELVING

- A. Grade: Custom.
- B. Shelf Material: 3/4-inch plastic laminate veneer-faced panel product with veneer edge banding.

2.11 INTERIOR FRAMES AND JAMBS FOR OPAQUE FINISH

- A. Grade: Custom.
- B. Wood Species: Any closed-grain hardwood.

2.12 PREFABRICATED WARDROBES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Savoy Nittany wardrobe chest model number N-WC-3624-1-3 or one of the following:
 - 1. RT London Contract Furniture.
 - 2. Sauder Educational Furniture
- B. Wardrobe shall be oak construction, finish to be selected by Architect from manufacturer's full range of colors.
- C. Interior Design Components:
 - 1. One large bottom drawer.
 - 2. 3 smaller drawers on right side of cabinet with storage shelf above.
 - 3. Clothes rod with shelf on left side.
- D. Unit shall have two doors that cover the hanging rod components on the left and the open shelf/drawer components on the right.

2.13 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
 - 1. Do not use plain-sawn softwood lumber with exposed, flat surfaces more than 3 inches wide.
 - 2. Wood Moisture Content: 5 to 10 percent.
- B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
 - 1. Medium-Density Fiberboard: ANSI A208.2, Grade 130.
 - 2. Particleboard: ANSI A208.1, Grade M-2.
 - 3. Softwood Plywood: DOC PS 1, medium-density overlay.
 - 4. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1.

5. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD 3, Grade VGL, for test methods 3.3, 3.4, 3.6, 3.8, and 3.10.

2.14 CABINET HARDWARE AND ACCESSORIES

- A. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 170 degrees of opening, self-closing; equivalent to following:
 1. Blum No. 71 6580 with Plate 173H9100
 2. Grass No. 3903VZ with mounting plate 10761
 3. Hafele No. 329.07.654 with plate
- B. Wire Pulls: Back mounted, BHMA A156.9, B02011 solid brass, 4 inches long, 5/16 inch in diameter; equivalent to the following:
 1. 4484 by Stanley Hardware.
 2. MC-4024 by Epco Hardware.
 3. No. 6208 by National Lock and Cabinet Hardware.
- C. Adjustable Shelf Standards and Supports:
 1. BHMA A156.9, B04071; with shelf rests, B04081 for end-mounted cabinet shelving, equivalent to No. 255-256 by Knappe and Vogt Manufacturing Co.
 2. BHMA A156.9, B04102; with shelf brackets, B04112 for back-mounted wall shelving, equivalent to the following:
 - a. Extra Heavy-duty: No. 85-185, Double-Slot by Knappe and Vogt Manufacturing Co., or approved equal.
- D. Counter Support Brackets:
 1. Basis-of-Design Product: Subject to compliance with requirements, provide "Rakks Counter Support Bracket, EH Series" by the Rangine Corporation or acceptable comparable product.
 2. Configuration: Surface mounted.
 3. Material: ASTM B221, 6063 T5, horizontal T-shape and vertical L-shape extruded aluminum bracket with MIG welding across 45-degree miters and back.
 4. Load Capacity: 450 pounds per bracket minimum.
 5. Faceplates: 4-inch by 4-inch aluminum faceplates with adhesive backing, notched to fit around vertical flange of flush mounted counter support bracket, to conceal penetration through gypsum board.

6. Finish: Custom powder coat finish as selected by Architect from manufacturer's full range.
- E. Drawer Slides: BHMA A156.9, B05111; Side-mounted, full-extension, all ball bearing zinc-plated steel drawer slides with hold-in detent rated for indicated loads, and equivalent to the following:
 1. Drawers 6-inches or less in depth and up to 16-inches in width:
 - a. Model 3832SC, 100 lb./pr. (45kg) load rating, telescoping, self-closing movement, by Accuride International, or approved equal.
 2. Drawers 6-inches or less in depth and up to 24-inches in width:
 - a. Model 7432, 100 lb./pr. (45kg) load rating, progressive movement, by Accuride International, or approved equal.
 3. Drawers over 6-inches in depth and up to 42-inches in width:
 - a. Model 3640, 200lb./pr. (90 kg) load rating, sequential movement, by Accuride International, or approved equal.
- F. Door and Drawer Locks:
 1. Door and Drawer Locks: Multi-function pin tumbler cam locks suitable for specific project applications. All brass construction with 26D-Dull Chrome finish, equivalent to "No. C8103 by National Lock Co.," or approved equal. Provide two stamped brass keys per lock. Locks to be capable of 850 key changes.
- G. Door and Drawer Silencers: BHMA A156.16, L03011.
- H. Grommets for Cable Passage through Countertops: 2-inch OD, black, molded-plastic grommets and matching plastic caps with slot for wire passage.
- I. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
 1. Satin Chromium Plated: BHMA 626 for brass or bronze base; BHMA 652 for steel base.
- J. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

2.15 MISCELLANEOUS MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.
- B. Adhesive for Bonding Plastic Laminate: Contact cement.
 1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

- C. Sealant for Countertops: Comply with applicable requirements in Section 079200 "Joint Sealants."

2.16 FABRICATION

- A. Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.
- B. Fabricate woodwork to dimensions, profiles, and details indicated.
1. Ease edges to radius indicated for the following:
 - a. Corners of Cabinets and Solid-Wood (Lumber) Members: 1/16 inch unless otherwise indicated.
- C. Solid-Surfacing Countertops: Fabricate countertops according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WT's "Architectural Woodwork Standards."
1. Grade: Custom.
 2. Configuration:
 - a. Front: Straight, slightly eased at top.
 - b. Backsplash: Straight, slightly eased at corner.
 - c. End Splash: Matching backsplash.
 3. Countertops: Thickness as indicated in the Drawings-, solid surface material with front edge built up with same material, profile as indicated in the Drawings.
 4. Fabricate tops and backsplashes with shop-applied edges unless otherwise indicated. Comply with solid surface material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.
 - a. Fabricate with loose backsplashes for field assembly.
 - b. Install integral sink bowls in countertops in the shop.
 5. Joints: Fabricate countertops without joints to the greatest extent possible. If joints are required in the field, do not place within 18 inches of a sink or less than 36 inches long. Indicate on shop drawings if field joint will be required.
 6. Cutouts and Holes:
 - a. Undercounter Plumbing Fixtures: Make cutouts for fixtures in shop using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves.
 - 1) Provide vertical edges, slightly eased at juncture of cutout edges with top and bottom surfaces of countertop and projecting 3/16 inch into fixture opening.
 - b. Counter-Mounted Plumbing Fixtures: Prepare countertops in shop for field cutting openings for counter-mounted fixtures. Mark tops for cutouts and drill holes at

corners of cutout locations. Make corner holes of largest radius practical.

- c. Fittings: Drill countertops in shop for plumbing fittings, undercounter soap dispensers, and similar items.
- D. Ornamental Woodwork: Fabricate ornamental woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
 - 1. Edges of Solid-Wood (Lumber) Members: 1/16 inch unless otherwise indicated.
 - 2. Edges of Rails and Similar Members More Than 3/4 Inch Thick: 1/8 inch.
- E. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
 - 1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
 - 2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements before disassembling for shipment.
- F. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
 - 1. Seal edges of openings in countertops with a coat of varnish.

2.17 SHOP FINISHING

- A. General: Finish architectural wood cabinets at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.
- B. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural wood cabinets, as applicable to each unit of work:
 - 1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of cabinets.
- C. Transparent Finish:
 - 1. Grade: Custom.
 - 2. Finish: System - 12, water-based polyurethane.

3. Wash Coat for Closed-Grain Woods: Apply wash-coat sealer to cabinets made from closed-grain wood before staining and finishing.
 4. Staining: Match Architect's sample.
 5. Open Finish for Open-Grain Woods: Do not apply filler to open-grain woods.
 6. Filled Finish for Open-Grain Woods: After staining, apply wash-coat sealer and allow to dry. Apply paste wood filler and wipe off excess. Tint filler to match stained wood.
 7. Sheen: Semi-gloss, 46-60 gloss units measured on 60-degree gloss meter per ASTM D 523.
 8. Sheen: Match Architect's sample.
- D. Opaque Finish:
1. Grade: Custom.
 2. Finish: System - 12, water-based polyurethane.
 3. Color: As selected by Architect from manufacturer's full range.
 4. Sheen: Semigloss, 46-60 gloss units measured on 60-degree gloss meter per ASTM D 523.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition cabinets to average prevailing humidity conditions in installation areas.
- B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

- A. Grade: Install interior architectural woodwork to comply with same grade as item to be installed.
- B. Cabinets:
 1. Assemble cabinets and complete fabrication at Project site to the extent that it was not completed in the shop.
 2. Install cabinets level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.
 3. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

4. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.
 - a. For shop finished items use filler matching finish of items being installed.
 5. Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
 - a. Install cabinets with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
 - b. Maintain veneer sequence matching of cabinets with transparent finish.
 - c. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches o.c. with No. 10 wafer-head screws sized for not less than 1-1/2-inch penetration into wood framing, blocking, or hanging strips.
- C. Plastic-Laminate-Faced Countertops: Assemble countertops and complete fabrication at Project site to the extent that it was not completed in the shop.
1. Provide cutouts for appliances, plumbing fixtures, electrical work, and similar items.
 2. Field Jointing: Where possible, make in the same manner as shop jointing, using dowels, splines, adhesives, and fasteners recommended by manufacturer. Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required. Locate field joints where shown on Shop Drawings.
 - a. Secure field joints in plastic-laminate countertops with concealed clamping devices located within 6 inches of front and back edges and at intervals not exceeding 24 inches. Tighten according to manufacturer's written instructions to exert a constant, heavy-clamping pressure at joints.
 3. Install countertops level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.
 4. Scribe and cut countertops to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
 5. Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
 - a. Install countertops with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
 - b. Secure backsplashes to walls with adhesive.

- c. Seal junctures of tops, splashes, and walls with mildew-resistant silicone sealant or another permanently elastic sealing compound recommended by countertop material manufacturer.

D. Solid Surfacing Countertops

1. 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.
2. Fasten countertops by screwing through corner blocks of base units into underside of countertop. Predrill 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.
3. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.
4. 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.
5. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.
 - a. Install metal splines in kerfs in countertop edges at joints where indicated. Fill kerfs with adhesive before inserting splines and remove excess immediately after adjoining units are drawn into position.
 - b. Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned and joints are of specified width.
6. 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.
7. 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.
8. 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.
 - a. Seal edges of cutouts in particleboard subtops by saturating with varnish.
9. Apply sealant to gaps at walls; comply with Section 079200 "Joint Sealants."

- E. Ornamental Woodwork: Assemble ornamental woodwork and complete fabrication at Project site to the extent that it was not completed in the shop.
1. Install ornamental woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.
 2. Scribe and cut ornamental woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
 3. Anchor ornamental woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with ornamental woodwork.
 - a. For shop-finished items, use filler matching finish of items being installed.
- F. Interior Standing and Running Trim: Assemble wood trim and complete fabrication at Project site to the extent that it was not completed in the shop.
1. Install wood trim level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.
 2. Scribe and cut wood trim to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
 3. Anchor wood trim to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.
 - a. For shop-finished items, use filler matching finish of items being installed.
 4. Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible. Do not use pieces less than 36 inches long except where shorter single-length pieces are necessary.
 - a. Fill gaps, if any, between top of base and wall with latex sealant, painted to match wall.
 - b. Install standing and running trim with no more variation from a straight line than 1/8 inch in 96 inches.
- G. Wood Frames and Jambs: Assemble wood frames and complete fabrication at Project site to the extent that it was not completed in the shop.
1. Install wood frames level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.
 2. Scribe and cut wood frames to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

3. Anchor wood frames to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.
 - a. For shop-finished items, use filler matching finish of items being installed.
- H. Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.
 1. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are applied in shop.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean exposed and semi-exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 064023

SECTION 064216 - FLUSH WOOD PANELING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Flush wood paneling.
 - 2. Wood furring, blocking, shims, and hanging strips for installing flush wood paneling that is not concealed within other construction.
 - 3. Shop finishing of flush wood paneling.

1.2 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that paneling can be installed as indicated.

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. Shop Drawings: For flush wood paneling.
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Show details full size.
 - 3. Show locations and sizes of furring and blocking, including concealed blocking specified in other Sections.
 - 4. For paneling produced from premanufactured sets, show finished panel sizes, set numbers, sequence numbers within sets, and method of cutting panels to produce indicated sizes.
 - 5. Apply AWI Quality Certification Program label to Shop Drawings.
- C. Samples for Verification: For the following:
 - 1. Veneer-Faced Panel Products for Opaque Finish: 8 by 10 inches, for each finish system and color, with exposed surface finished.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.
- B. Product Certificates: For each type of product.

- C. Quality Standard Compliance Certificates: AWI Quality Certification Program.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that 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.
 - 1. Shop Certification: AWI's Quality Certification Program accredited participant.
- B. Installer Qualifications: AWI's Quality Certification Program accredited participant.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver paneling until painting and similar operations that might damage paneling have been completed in installation areas. Store paneling in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install paneling until building is enclosed, wet-work is complete, and HVAC system is operating and will maintain temperature between 60 and 90 deg F and relative humidity between 25 and 55 percent during the remainder of the construction period.
- B. Field Measurements: Where paneling is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Locate concealed framing, blocking, and reinforcements that support paneling by field measurements before being enclosed/concealed by construction and indicate measurements on Shop Drawings.
- C. Established Dimensions: Where paneling 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.

PART 2 - PRODUCTS

2.1 PANELING, GENERAL

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of flush wood paneling (wood-veneer wall surfacing) indicated for construction, finishes, installation, and other requirements.
 - 1. Provide inspections of fabrication and installation together with labels and certificates from AWI certification program indicating that woodwork complies with requirements of grades specified.

2.2 FLUSH WOOD PANELING (WOOD-VENEER WALL SURFACING)

- A. Grade: Custom.
- B. Panel Construction: Particleboard or MDF, with routed pattern indicated.
 - 1. Thickness: 3/4 inch.
- C. Assemble panels by gluing and concealed fastening.

2.3 MATERIALS

- A. Materials, General: Provide materials that comply with requirements of referenced quality standard for each quality grade specified unless otherwise indicated.
- B. Wood Moisture Content: 5 to 10 percent.
- C. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each quality grade specified unless otherwise indicated.
 - 1. MDF: ANSI A208.2, Grade 130.

2.4 INSTALLATION MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.
- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls.
- C. Installation Adhesive: Product recommended by panel fabricator for each substrate for secure anchorage.

2.5 FABRICATION

- A. Complete fabrication, including assembly, to maximum extent possible, before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
 - 1. Notify Architect seven days in advance of the dates and times paneling fabrication will be complete.
- B. Shop cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

2.6 SHOP FINISHING

- A. General: Finish paneling at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.
- B. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing paneling, as applicable to each unit of work.
 - 1. Backpriming: Apply two coats of sealer or primer, compatible with finish coats, to concealed surfaces of paneling.
- C. Opaque Finish:
 - 1. Grade: Custom.
 - 2. Finish: System - 12, water-based polyurethane.
 - 3. Color: As selected by Architect from manufacturer's full range.
 - 4. Sheen: Semigloss, 46-60 gloss units measured on 60-degree gloss meter per ASTM D 523.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition paneling to humidity conditions in installation areas.
- B. Before installing paneling, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

- A. Install paneling level, plumb, true in line, and without distortion. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches. Install with no more than 1/16 inch in 96-inch vertical cup or bow and 1/8 inch in 96-inch horizontal variation from a true plane.
 - 1. For flush paneling with revealed joints, install with variations in reveal width, alignment of top and bottom edges, and flushness between adjacent panels not exceeding 1/16 inch.
- B. Anchor paneling to supporting substrate with concealed panel-hanger clips.
 - 1. Do not use face fastening unless otherwise indicated.
- C. Complete finishing work specified in this Section to extent not completed at shop or before installation of paneling. Fill nail holes with matching filler where exposed.
 - 1. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are shop applied.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective paneling, where possible, to eliminate defects. Where not possible to repair, replace paneling. Adjust for uniform appearance.
- B. Clean paneling on exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 064216

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Blanket insulation.
 - a. Mineral-wool blanket insulation.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.3 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.

1.4 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.

PART 2 - PRODUCTS

2.1 MINERAL-WOOL BLANKET INSULATION

- A. Unfaced, Mineral-Wool Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Rockwool Inc.: COMFORTBATT.
 - b. Thermafiber, Inc.; an Owens Corning company; FS-15.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.

- 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. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.2 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

- A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
 - 1. 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.
 - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.

3.3 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. 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 072100

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Formed Products:
 - a. Formed wall sheet metal fabrications, blank off panels for existing louvers to be removed and openings capped.

1.2 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.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.
- B. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing and trim, including plans, elevations, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work. Include the following:
 - 1. Identification of material, thickness, weight, and finish for each item and location in Project.
 - 2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
 - 3. Details for joining, supporting, and securing sheet metal flashing and trim, including layout of fasteners, cleats, clips, and other attachments. Include pattern of seams.
 - 4. Include details for forming, including profiles, shapes, seams, and dimensions.
 - 5. Details of termination points and assemblies, including fixed points.
 - 6. Details of special conditions.
 - 7. Details of connections to adjoining work.
 - 8. Detail formed flashing and trim at 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. 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.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that 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 successful in-service performance.

1.5 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. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal flashing and trim installation.

1.6 WARRANTY

- A. Special Warranty on Coil-Coated Metal with Fluoropolymer Finishes: Manufacturer's standard form in which 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 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.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies as indicated 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. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.
- C. Thermal Movements: Provide sheet metal flashing and trim that allows 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 (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.
- B. Aluminum Sheet: ASTM B 209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required.
 - 1. Surface: Smooth, flat.
 - 2. Exposed Coil-Coated Finishes:
 - a. Three-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - b. Color: Custom color to match adjacent siding/brick color.
 - 3. Concealed Finish: Pretreat with 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.

2.3 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.
 - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating.

- b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
- 2. Fasteners for Aluminum Sheet: Aluminum or passivated Series 300 stainless steel.
- C. 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.
- D. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- E. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.4 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.
 - 1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 - 2. Obtain field measurements for accurate fit before shop fabrication.
 - 3. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
 - 4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.
 - 5. Fabricate corners, intersections and transitions in shop.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a 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.
- C. Sealant Joints: Where movable, non-expansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- D. Seams: Fabricate nonmoving seams with flat-lock seams.
 - 1. Aluminum Sheet and Metals with Coated Finish: Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.
- E. Do not use graphite pencils to mark metal surfaces.

2.5 WALL SHEET METAL FABRICATIONS

- A. Opening Flashings in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings. Form head and sill flashing with 2-inch- high, end dams. Fabricate from the following materials:
 - 1. Aluminum: 0.032 inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions 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. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 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, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 - 1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 - 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. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
 - 4. Install sealant tape where indicated.
 - 5. Torch cutting of sheet metal flashing and trim is not permitted.
 - 6. Do not use graphite pencils to mark metal surfaces.

- B. Metal Protection: Where dissimilar metals will contact each other, or where metal contacts pressure-treated wood or corrosive substrates, protect against galvanic action 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 back side of uncoated aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
- C. Fastener Sizes: Use fasteners of sizes that will penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- D. 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.
- E. Seal joints as shown and 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 moderate, between 40 and 70 deg F (4 and 21 deg C), 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 (4 deg C).
 - 2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."
- F. Rivets: Rivet joints in uncoated aluminum where indicated and where necessary for strength.

3.3 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standards unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
- B. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

3.4 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 as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.5 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean off excess sealants.
- C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of installation, remove unused materials and clean finished surfaces. Maintain in a 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.

END OF SECTION 076200

SECTION 078413 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Penetrations in fire-resistance-rated walls.
 - 2. Penetrations in horizontal assemblies.
 - 3. Penetrations in smoke barriers.
 - 4. Control voltage, communications and electronic safety and security cable penetrations.

1.2 PREINSTALLATION MEETINGS

- A. Pre-Installation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Product Schedule: For each penetration firestopping system. Include location and design designation of Underwriter's Laboratories (UL).
 - 1. Engineering Judgments: Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping condition, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly. Obtain approval of authorities having jurisdiction prior to submittal.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each penetration firestopping system, for tests performed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

- A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

- B. Documentation: Provide details of installations, each listed system along with Engineering Judgements (if any) and locations indicated on Life Safety Drawings for restoring the fire resistance rating or smoke resistant properties where a breach in an assembly occurs for any fire rated joint, penetration or safing slot. Such documentation shall be delivered in a binder, electronic format or software application/program to the building owner. Documentation shall be composed in a concise and comprehensible manner so that the Authority Having Jurisdiction (AHJ) can understand and verify installations at any time.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A single firm retained by the General Contractor, experienced in installing penetration firestopping systems similar in material, design, and extend to the systems required for this Project whose work has resulted in construction with record of successful performance and that has been approved by FM Global according to FM Global 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements." This contractor is to coordinate all firestopping, individual contractors such as gypsum board installers, mechanical, electrical, plumbing, fire protection, etc. will not be allowed to install firestopping.
 - 1. Member in good standing of the Firestop Contractors International Association (FCIA).
 - 2. Where applicable, licensed by the State where the Project is located or local Authority Having Jurisdiction (AHJ).
 - 3. Qualifications include having necessary experience, staff, and training to install penetration firestopping system in accordance with specified requirements.
 - 4. Manufacturer's willingness to sell its penetration firestopping systems to Contractor or installer engaged by Contractor does not in itself constitute approval.
- B. Regulatory Requirements: Provide firestopping conforming to the requirements of Authorities Having Jurisdiction (AHJ) and that has been reviewed by the applicable agency.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install penetration firestopping when ambient or substrate temperatures are outside limits permitted by penetration firestopping manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.
- B. Install and cure penetration firestopping per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.8 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping is installed according to specified requirements.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping.

- C. Firestop Contractor is to supply the necessary coordination information to all other trades on the project to ensure that tested fire stop systems are utilized to reduce the number of engineered judgments that may be necessary on the project.
- D. Notify Owner's testing agency at least seven (7) days in advance of penetration firestopping installations; confirm dates and times on day preceding each series of installations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics:
 - 1. Perform penetration firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
 - 2. Test per testing standards referenced in "Penetration Firestopping Systems" Article. Provide rated systems complying with the following requirements:
 - a. Penetration firestop systems installed with products bearing the classification marking of a qualified product certification agency in accordance with listed system designs published by a qualified testing agency.
 - 1) UL in its online directory "Product iQ."
- B. Penetration Firestopping Assembly Standard: Provide tested penetration firestopping assemblies that comply with and are installed in accordance with penetration firestopping assembly manufacturer's installation instructions and all written and graphic requirements in test assembly documentation.
 - 1. If penetration firestopping assemblies do not comply with requirements, research testing agency documents such as UL Online Certifications Directory or UL Fire Resistance Directory for assemblies that comply.
 - 2. If no penetration firestopping assemblies that comply can be identified, submit proposed "Engineering Judgement" to Architect as specified in Submittals article in Part 1 of this Section.

2.2 PENETRATION FIRESTOPPING

- A. Penetration Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.
 - 1. Products: Subject to compliance with requirements, provide one of the following products:

- a. 3M Fire Protection Products.
 - b. Hilti, Inc.
 - c. Specified Technologies, Inc.
2. Where openings around penetrating items do not meet UL system requirements, provide materials and systems with matching construction materials as required by the annular opening size requirement of the UL system. Where the opening cannot be closed as required to meet the annular opening size requirements of UL, obtain an engineering judgment of the UL system to be used from the Engineering Department of the manufacturer of the firestopping materials, verified in writing by UL.
- B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479.
 1. F-Rating: At least one hour, but not less than the fire-resistance rating of the wall penetrated.
 2. Membrane Penetrations: Install recessed fixtures such that the required fire resistance will not be reduced.
- C. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
 1. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
 2. T-Rating: At least one hour, but not less than the fire-resistance rating of the floor. The following floor penetrations do not require a T-rating:
 - a. Those within the cavity of a wall.
 - b. Floor, tub, or shower drains within a concealed space.
 - c. 4-inch (200-mm) or smaller metal conduit penetrating directly into metal-enclosed electrical switchgear.
 3. W-Rating: Provide penetration firestopping systems showing no evidence of water leakage when tested according to UL 1479.
- D. Penetrations in Smoke Barriers: Penetration firestopping systems with ratings determined per UL 1479, based on testing at a positive pressure differential of 0.30-inch wg.
 1. L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening at and no more than 50-cfm cumulative total for any 100 sq. ft. at both ambient and elevated temperatures.
- E. Control Voltage, Communications and Electronic Safety and Security Cable Penetrations in Fire-Resistance-Rated Walls and Smoke Barriers: Provide penetration firestopping with ratings described in this Section and with the ability for Owner to add or remove cables without the need for replacing fill materials.
 1. Products: Subject to compliance with the requirements, provide one of following fire-rated assemblies:

- a. CP 653 Speed Sleeve by Hilti, Inc.; 4 inch size.
 - b. EZ Path Series 44+ by Specified Technologies, Inc.
 2. Provide collars and plates required for mounting single and multiple devices adjacent to each other.
 3. Accessories: Provide following accessories required for applications indicated on Drawings:
 - a. Extension module increasing effective length.
 - b. Radius control module providing minimum bend radius for twisted pair cables.
 - c. Multi-gang wall bracket to allow one to five pathways in finished wall to be supported from stud.
 - d. Modular floor grid system allowing banks of pathways in floor.
 - e. T-rating accessory kit.
 - f. Caps for unoccupied wall bracket gangs to allow future capacity.
- F. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.
- G. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspecting agency for firestopping indicated.
 1. Permanent forming/damming/backing materials, including the following:
 - a. Slag-wool-fiber or rock-wool-fiber insulation.
 - b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
 - c. Fire-rated form board.
 - d. Fillers for sealants.
 2. Temporary forming materials.
 3. Substrate primers.
 4. Collars.
 5. Steel sleeves.

2.3 FILL MATERIALS

- A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

- B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.
- C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.
- D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized-steel sheet.
- E. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.
- F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
- G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.
- H. Pillows/Bags: Reusable heat-expanding pillows, bags or cushions consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives. Where exposed, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed.
- I. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.
- J. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:
 - 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and sloped surfaces, unless indicated firestopping limits use of nonsag grade for both opening conditions.
- K. Putty Pad or Box Insert: Protective materials designed to protect electrical outlet boxes.
- L. Firestop Board: Material for large openings to accommodate electrical busways, raceways, cable trays, and multiple copper pipes.
- M. Drop-In Device: Pre-formed device with integrated intumescent strips for use with noncombustible and combustible pipes and/or cable bundles.
- N. Firestop Plug: Intumescent system for sealing the ends of empty or abandoned sleeves with zero percent cable load.

2.4 MIXING

- A. Penetration Firestopping Materials: For those products requiring mixing before application, comply with penetration firestopping manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, 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: Clean out openings immediately before installing penetration firestopping to comply with manufacturer's written instructions and with the following requirements:
 - 1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping.
 - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Priming: Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent penetration firestopping from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing firestopping's seal with substrates.
- D. Control Voltage, Communications and Electronic Safety and Security Cable Penetrations in Fire-Resistance-Rated Walls and Smoke Barriers: Coordinate calculations of allowable fill ratio with control voltage, communications and electronic safety, and security installers to ensure size of sleeves, openings, core-drilled holes, or cut openings can accommodate cable load according to specified conduit fill.

3.3 INSTALLATION

- A. General: Install penetration firestopping 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 fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
 - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestopping.
- C. Install fill materials for firestopping by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
 - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.
- D. Control Voltage, Communications and Electronic Safety and Security Cable Penetrations in Fire-Resistance-Rated Walls and Smoke Barriers:
 - 1. Where specified mechanical device cannot be used in openings in floors and walls, provide products that allow re-entry and do not cure or dry.
 - 2. Where empty sleeves are installed for future cables or as abandoned cables are harvested, seal both sides of empty sleeves with firestop plug.

3.4 IDENTIFICATION

- A. Wall Identification: Permanently label walls containing penetration firestopping systems with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS" or other text acceptable to Authorities Having Jurisdiction (AHJ) using lettering not less than 3 inches high and with minimum 0.375-inch strokes.
 - 1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 feet from end of wall and at intervals not exceeding 30 feet measured horizontally along wall or partition.
- B. Penetration Identification: Identify penetration firestopping with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of firestopping edge so labels will be visible to anyone seeking to remove penetrating items or firestopping. 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 - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
 - 2. Contractor's name, address, and phone number.

3. Designation of applicable testing and inspecting agency.
4. Date of installation.
5. Manufacturer's name.
6. Installer's name.

3.5 FIELD QUALITY CONTROL

- A. Contractor shall engage a qualified testing agency to perform tests and inspections.
- B. Where deficiencies are found or penetration firestopping is damaged or removed because of testing, repair or replace penetration firestopping to comply with requirements.
- C. Proceed with enclosing penetration firestopping with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

- A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping is without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping and install new materials to produce systems complying with specified requirements.

3.7 THROUGH-PENETRATION UL CLASSIFICATION SYSTEM

	Construction Penetrated	Type of Construction	System Identification
No penetrating Items:	F,W,C	A,B,J,K,L	0001-0999
Metallic Pipes, Conduit or Tubing:	F,W,C	A,B,J,K,L	1001-1999
Nonmetallic Pipe, Conduit or Tubing:	F,W,C	A,B,J,K,L	2001-2999
Electric Cables:	F,W,C	A,B,J,K,L	3001-3999
Cable, Trays with Electric Cables:	F,W,C	A,B,J,K,L	4001-4999
Insulated Pipes:	F,W,C	A,B,J,K,L	5001-5999
Electrical Bussduct Penetrations:	F,W,C	A,B,J,K,L	6001-6999
Mechanical Ductwork Penetrations:	F,W,C	A,B,J,K,L	7001-7999

Multiple Penetrations Through Common Openings:	F,W,C	A,B,J,K,L	8000-8999
Control Voltage, Communications and Electronic Safety and Security Cable Penetrations in Fire-Resistance-Rated Walls and Smoke Barriers	F, W, C	A, B, J, K, L	N/A

1. Key to Construction Penetrated
 - a. F Floor Penetration
 - b. W Wall Penetration
 - c. C Either floor or wall penetration
2. Key to Type of Construction
 - a. A Concrete floor equal to or less than 5-inches thick
 - b. B Concrete floors greater than 5-inches thick
 - c. J Concrete or masonry walls equal to or less than 8-inches thick
 - d. K Concrete of masonry walls greater than 8-inches thick
 - e. L Framed Walls

END OF SECTION 078413

SECTION 078443 - JOINT FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Joints in or between fire-resistance-rated constructions.
 - 2. Joints at exterior curtain-wall/floor intersections.
 - 3. Joints in smoke barriers.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 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 developed in accordance with current International Firestop Council (IFC) guidelines.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Listed System Designs: For each joint firestopping system, for tests performed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

- A. Installer Certificates: From Installer indicating that joint firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.
- B. Documentation: Provide details of installations, each listed system along with Engineering Judgements (if any) and locations indicated on Life Safety Drawings for restoring the fire resistance rating or smoke resistant properties where a breach in an assembly occurs for any fire rated joint, penetration or safig slot. Such documentation shall be delivered in a binder, electronic format or software application/program to the building owner. Documentation shall be composed

in a concise and comprehensible manner so that the Authority Having Jurisdiction (AHJ) can understand and verify installations at any time.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A single firm retained by the General Contractor, that has been approved by FM Global according to FM Global 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with UL's "Qualified Firestop Contractor Program Requirements." This contractor is to coordinate all joint firestopping, individual contractors such as gypsum board installers, mechanical, electrical, plumbing, fire protection, etc. will not be allowed to install joint firestopping.
1. Member in good standing of the Firestop Contractors International Association (FCIA).
 2. Where applicable, licensed by the State where the Project is located or local Authority Having Jurisdiction (AHJ).
 3. Qualifications include having necessary experience, staff, and training to install joint firestopping system in accordance with specified requirements.
 4. Manufacturer's willingness to sell its penetration firestopping systems to Contractor or installer engaged by Contractor does not in itself constitute approval.

1.7 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.

1.8 COORDINATION

- A. Coordinate construction of joints to ensure that joint firestopping systems can be installed according to specified firestopping system design.
- B. Contractor shall coordinate floor to curtain wall joint system with curtain wall manufacturer and installer prior to submitting shop drawings to ensure entire assembly condition meets UL requirements.
- C. Coordinate sizing of joints to accommodate joint firestopping systems.
- D. Firestop Contractor is to supply the necessary coordination information to all other trades on the project to ensure that tested fire stop systems are utilized to reduce the number of engineered judgments that may be necessary on the project.
- E. Notify Owner's testing agency at least seven days in advance of fire-resistive joint system installations; confirm dates and times on day preceding each series of installations.

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) All assemblies are to work with building movements indicated and UL approved designs.

2.2 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. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. 3M Fire Protection Products.
 - b. Hilti, Inc.
 - c. Roxul Inc.
 - d. Specified Technologies, Inc.
 - e. Thermafiber, Inc.; an Owens Corning company.
 2. Joints include those installed in or between fire-resistance-rated walls, floor or floor/ceiling assemblies, and roofs or roof/ceiling assemblies.
 3. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of the wall, floor, or roof in or between which it is installed.
- C. Joints at Exterior Curtain-Wall/Floor Intersections: Provide joint firestopping systems with rating determined per ASTM E 2307 or determined by ASTM E 119 based on testing at a positive pressure differential of 0.01-inch wg.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. 3M Fire Protection Products.
 - b. Hilti, Inc.
 - c. Roxul Inc.
 - d. Specified Technologies, Inc.
 - e. Thermafiber, Inc.; an Owens Corning company.
 2. F-Rating: Equal to or exceeding the fire-resistance rating of the floor assembly.
- 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. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. 3M Fire Protection Products.
 - b. Hilti, Inc.
 - c. Roxul Inc.
 - d. Specified Technologies, Inc.
 - e. Thermafiber, Inc.; an Owens Corning company.
 2. 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.
- 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.

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.
- C. Masking Tape: Use masking tape to prevent fill materials of fire-resistive joint system from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing fire-resistive joint system's seal with substrates.

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.

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: Contractor shall engage a qualified testing agency to perform tests and inspections according to ASTM E 2393.
- 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.

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.

3.7 JOINT FIRESTOPPING SYSTEM SCHEDULE

- A. Where UL-classified systems are indicated, they refer to system numbers in UL's "Fire Resistance Directory" under product Category XHBN or Category XHDG.

END OF SECTION 078443

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Silicone joint sealants.
 - 2. Non-staining silicone joint sealants.
 - 3. Urethane joint sealants.
 - 4. Mildew-resistant joint sealants.
 - 5. Butyl joint sealants.
 - 6. Latex joint sealants.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product.
- B. 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.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each kind of joint sealant, for tests performed by manufacturer and witnessed by a qualified testing agency.
- B. 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.
- C. Field-Adhesion-Test Reports: For each sealant application tested.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Product Testing: Test joint sealants using a qualified testing agency.
 - 1. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

1.6 PRECONSTRUCTION TESTING

- A. 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 kind of sealant and joint substrate.
 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 X1.1 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.
 5. 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.
 6. 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.

1.7 FIELD 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 (5 deg C).
 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.

1.8 WARRANTY

- A. Special Installer's Warranty: 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 agrees to furnish joint sealants to repair or replace those joint sealants that do 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.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
 - 1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 - 2. Disintegration of joint substrates from 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 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. Source Limitations: Obtain each kind of joint sealant from a single source from a single manufacturer.
- C. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 NON-STAINING SILICONE JOINT SEALANTS

- A. Non-Staining Joint Sealants: No staining of substrates when tested according to ASTM C 1248.
- B. Silicone, Non-Staining, S, NS, 100/50, T, NT: Non-staining, single-component, non-sag, plus 100 percent and minus 50 percent movement capability, traffic- and non-traffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 100/50, Uses T and NT.
 - 1. Products: Subject to compliance with requirements, provide the following:
 - a. Dow Corning Corporation; Dow Corning 790 Silicone Building Sealant.

2.3 MILDEW-RESISTANT JOINT SEALANTS

- A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.

- B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, non-sag, plus 25 percent and minus 25 percent movement capability, non-traffic-use, acid-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT:

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Dow Corning Corporation; DOW CORNING 786 SILICONE SEALANT -.
 - b. GE Construction Sealants; Momentive Performance Materials Inc.; SCS1700 Sanitary.
 - c. May National Associates, Inc.; a subsidiary of Sika Corporation; Bondaflex Sil 100 WF.
 - d. Tremco Incorporated; Tremsil 200.

2.4 BUTYL JOINT SEALANTS

- A. Butyl-Rubber-Based Joint Sealants: ASTM C 1311.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Bostik, Inc; Chem-Calk 300.
 - b. Pecora Corporation; BC-158.

2.5 LATEX JOINT SEALANTS

- A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Franklin International; Titebond UA 920 Sealant.
 - b. Pecora Corporation; AC-20.
 - c. Sherwin-Williams Company (The); PowerHouse Siliconized Acrylic Latex Sealant.
 - d. Tremco Incorporated; Tremflex 834.

2.6 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Non-staining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) Type O (open-cell material), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
1. Use Type O on interior joint of double sealant joints only.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

- D. Weep Tube: Tube to fill width of joint indicated for use. Color is to match the surrounding sealant color.

2.7 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 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 performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 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. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 - c. Unglazed surfaces of ceramic tile.
 - 3. Remove laitance and form-release agents from concrete.

4. 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. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
 - c. Porcelain enamel.
 - d. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 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 C 1193 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 Non-sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.
 4. Provide recessed joint configuration of recess depth and at locations indicated on Drawings according to Figure 8C in ASTM C 1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
1. Extent of Testing: Test completed and cured sealant joints as follows:
 - a. Perform 10 tests for the first 1000 feet of joint length for each kind of sealant and joint substrate.
 - b. Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.
 2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
 - a. 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.
 3. Inspect tested joints and report on the following:
 - a. Whether sealants filled joint cavities and are free of voids.
 - b. Whether sealant dimensions and configurations comply with specified requirements.
 - c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.

4. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
 5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.
- B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 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.

3.6 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, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal non-traffic surfaces JS-01.
1. Joint Locations:
 - a. Construction joints in cast-in-place concrete.
 - b. Control and expansion joints in unit masonry.
 - c. Joints between metal panels.
 - d. Joints between different materials listed above.
 - e. Perimeter joints between materials listed above and frames of doors windows and louvers.
 - f. Control and expansion joints in ceilings and other overhead surfaces.
 2. Joint Sealant - Silicone:
 - a. Single Component:
 - 1) Non-Staining: Silicone, Non-staining, S, NS, 100/50, T, NT.

3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- B. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal non-traffic surfaces not subject to significant movement JS-02.
 1. Joint Locations:
 - a. Control joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints between interior wall surfaces and frames of interior doors windows and.
 - c. Other joints as indicated on Drawings.
 2. Joint Sealant: Acrylic latex.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- C. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal non-traffic surfaces JS-03.
 1. Joint Locations:
 - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - b. Tile control and expansion joints where indicated.
 - c. Other joints as indicated on Drawings.
 2. Joint Sealant: Silicone, mildew resistant, acid curing, S, NS, 25, NT.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- D. Joint-Sealant Application: Concealed mastics JS-04.
 1. Joint Locations:
 - a. Aluminum thresholds.
 - b. Sill plates.
 - c. Other joints as indicated on Drawings.
 2. Joint Sealant: Butyl-rubber based.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Interior standard steel doors and frames.

1.2 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.3 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.

1.4 PREINSTALLATION MEETINGS

- A. Pre-Installation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, core descriptions, fire-resistance ratings, temperature-rise 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.
 - 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. Indicate glazing materials, including fire-rated glazing.
- C. Schedule: Provide a schedule of hollow-metal work 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.

1.6 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 Fire and Egress Door Assembly Inspector (FDAI) certificate.
- B. Product Test Reports: For each type of fire rated hollow-metal door and frame assembly, for tests performed by a qualified testing agency indicating compliance with performance requirements.
- C. Oversize Construction Certification: For assemblies required to be fire rated and exceeding limitations of labeled assemblies.
- D. Thermal Performance Certification: For exterior door assemblies, submit certification required under "Quality Assurance" of this specification.
- E. Field quality control reports.

1.7 QUALITY ASSURANCE

- A. Fire-Rated Door Inspector Qualifications: Inspector for field quality control inspections of fire-rated door assemblies is to 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 is to 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.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use non-vented plastic.
 - 1. Provide additional protection to prevent damage to factory-finished units.
 - 2. Inspect on delivery for damage. Minor damages may be repaired provided refinished items match new work and are acceptable to Architect. Remove and replace damaged items that cannot be repaired as directed.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow-metal work 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 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Ceco Door Products; an Assa Abloy Group company.
 - 2. Curries Company; an Assa Abloy Group company.
 - 3. Pioneer Industries, Inc.
 - 4. Republic Doors and Frames.
 - 5. Steelcraft; an Allegion brand.
- B. Source Limitations: Obtain hollow-metal work from single source from single manufacturer regularly engaged in the manufacture of hollow metal doors and frames for not less than 5 years.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings and temperature-rise limits indicated, based on testing at positive pressure according to NFPA 252 or UL 10C, Category A positive pressure fire doors.
 - 1. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets 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.
3. **Temperature-Rise Limit:** At vertical exit enclosures and exit passageways, provide doors that have maximum transmitted temperature end point of 450 degrees F maximum in 30 minutes of standard fire-test exposure.
- B. **Fire-Rated, Borrowed-Light Assemblies and Fire-Rated Window Assemblies:** Complying with NFPA 80 and listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.
- C. **Thermally Rated Door Assemblies:** Provide door assemblies with U-factor of not more than 0.38 deg Btu/F x h x sq. ft. when tested according to ASTM C 518.

2.3 INTERIOR DOORS AND FRAMES

- A. Construct interior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. **Standard Heavy-Duty Doors and Frames:** SDI A250.8, Level 2.
 1. **Physical Performance:** Level B according to SDI A250.4.
 2. **Doors:**
 - a. **Type:** As indicated in the Door Schedule.
 - b. **Thickness:** 1-3/4 inches.
 - c. **Face:** Uncoated, cold-rolled steel sheet, minimum thickness of 0.042 inch.
 - d. **Edge Construction:** Model 1, Full Flush.
 - e. **Edge Bevel:** Provide manufacturer's standard beveled or square edges.
 - f. **Core:** Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core at manufacturer's discretion.
 - g. **Fire-Rated Core:** Manufacturer's standard laminated mineral board core for fire-rated doors.
 3. **Frames:**
 - a. **Materials:** Uncoated cold-rolled steel sheet, minimum thickness of 0.053 inch.
 - b. **Sidelite Frames:** Fabricated from same thickness material as adjacent door frame.
 - c. **Construction:** Face welded.
 4. **Exposed Finish:** Prime.

2.4 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
 - 2. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
 - 3. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches of frame height above 7 feet.
- B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch, and as follows:
 - 1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
 - 2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at finish floor surface.
- C. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.
- D. Material: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.
 - 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M; hot-dip galvanized according to ASTM A 153/A 153M, Class B.

2.5 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.
- D. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- E. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.
- F. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and

smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

- G. Glazing: Comply with requirements in Division 08 Section "Glazing."

2.6 FABRICATION

- A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Hollow-Metal Doors:
1. Steel-Stiffened Door Cores: Provide minimum thickness 0.026 inch, steel vertical stiffeners of same material as face sheets extending full-door height, with vertical webs spaced not more than 6 inches apart. Spot weld to face sheets no more than 5 inches o.c. Fill spaces between stiffeners with glass- or mineral-fiber insulation.
 2. Fire Door Cores: As required to provide fire-protection ratings indicated.
 3. Vertical Edges for Single-Acting Doors: Provide beveled or square edges at manufacturer's discretion.
 4. Top Edge Closures: Close top edges of doors with of same material as face sheets.
 5. Bottom Edge Closures: Close bottom edges of doors with end closures or channels of same material as face sheets.
 6. Door Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.
- C. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
1. Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 3. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
 4. Jamb Anchors: Provide number and spacing of anchors as follows:

- a. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches high.
 - 2) Four anchors per jamb from 60 to 90 inches high.
 - 3) Five anchors per jamb from 90 to 96 inches high.
 - 4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
- 5. Head Anchors: Two anchors per head for frames more than 42 inches wide and mounted in metal-stud partitions.
- 6. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
 - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- D. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.
- E. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised and electric hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
 - 1. Reinforce doors and frames to receive non-templated, mortised, and surface-mounted door hardware.
 - 2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.
 - 3. In accordance with NFPA 80, Section 4.1.3, field modifications of mortised and electric hardware not acceptable.
- F. Glazed Lites: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with butted hairline joints.
 - 1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
 - 2. Provide stops and moldings flush with face of door, and with square stops unless otherwise indicated.
 - 3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames. Provide loose stops and moldings on inside of hollow-metal doors and frames.
 - 4. Provide loose stops and moldings on inside of hollow-metal work.
 - 5. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

6. Provide stops for installation with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

2.7 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 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.

3.2 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.
- B. Drill and tap doors and frames to receive non-templated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow-metal doors and frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and manufacturer's written instructions.
- B. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 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 without damage to completed Work.
 - 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. Touch-up finishes.
 - c. Install frames with removable stops located on secure side of opening.
 - d. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - e. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
- 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
 - a. Floor anchors may be set with power-actuated fasteners instead of post-installed expansion anchors if so indicated and approved on Shop Drawings.
- 3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
- 4. In-Place Metal or Wood-Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.
- 5. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb 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 hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
 - 1. Non-Fire-Rated Steel Doors: Comply with 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: 5/8 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 088000 "Glazing" and with hollow-metal manufacturer's written instructions.
 - 1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

3.4 ADJUSTING AND CLEANING

- 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. 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.
- C. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.
- D. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 081113

SECTION 081416 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 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.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of door indicated. Include details of core and edge construction and trim for openings. Include factory-finishing specifications.
- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.
 - 1. Indicate dimensions and locations of mortises and holes for hardware.
 - 2. Indicate dimensions and locations of cutouts.
 - 3. Undercuts.
 - 4. Indicate requirements for veneer matching.
 - 5. Indicate doors to be factory finished and finish requirements.
 - 6. Indicate fire-protection ratings for fire-rated doors.
- C. 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 the finished work.
 - 2. Frames for light openings, 6 inches long, for each material, type, and finish required.

1.4 INFORMATIONAL SUBMITTALS

- A. Warranty: Sample of special warranty.
- B. Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.
- C. Qualification Data: For door inspector.
 - 1. Field quality-control reports 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.
- D. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Manufacturer's Certification: Licensed participant in AWT's Quality Certification Program.
- B. Fire-Rated Door Inspector Qualifications: Inspector for field quality-control inspections of fire-rated door assemblies complies with qualifications set forth in NFPA 80, Section 5.2.3.1 and the following:
 - 1. DHI's Fire and Egress Door Assembly Inspector (FDAI) certification.
- C. Egress Door Inspector Qualifications: Inspector for field quality-control inspections of egress door assemblies shall comply with qualifications set forth in NFPA 101, Section 7.2.1.15.4 and the following:
 - 1. DHI's Fire and Egress Door Assembly Inspector (FDAI) certification.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in plastic bags or cardboard cartons.
- C. Mark each door on top and bottom rail with opening number used on Shop Drawings.
- D. Store doors flat on level raised platforms in clean, dry, well-ventilated area protected from sunlight and weather. Cover but allow for air circulation.

1.7 FIELD CONDITIONS

- 1. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 25 and 55 percent during the remainder of the construction period.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Warping (bow, cup, or twist) more than 1/4-inch in a 42-by-84-inch section.
 - b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 76.2-mm) 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 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Algoma Hardwoods, Inc.
 - 2. Eggers Industries.
 - 3. Graham Wood Doors; an ASSA ABLOY Group company.
 - 4. Marshfield Door Systems, Inc.
 - 5. Oshkosh Architectural Door Company.
 - 6. VT Industries Inc.
- B. Source Limitations: Obtain flush wood doors from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Wood Door and Frame 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 in accordance with UL 10C or NFPA 252.

2.3 FLUSH WOOD DOORS, GENERAL

- A. Quality Standard: In addition to requirements specified, comply with AWI's, AWMAC's, and WI's "Architectural Woodwork Standards"
 - 1. Provide AWI Quality Certification Labels indicating that doors comply with requirements of grades specified.

2. Contract Documents contain selections chosen from options in quality standard and additional requirements beyond those of quality standard. Comply with those selections and requirements in addition to quality standard.
- B. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
1. 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.
 2. Temperature-Rise Limit: Where indicated, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
 3. Cores: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
 4. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
 5. Pairs: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.
- C. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control, based on testing according to UL 1784.
- D. Particleboard-Core Doors:
1. Particleboard: ANSI A208.1, Grade LD-1 or Grade LD-2, made with binder containing no urea-formaldehyde resin.
 2. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.
 3. Provide doors with cores instead of particleboard cores for doors indicated to receive exit devices.
- E. Mineral-Core Doors:
1. Core: Noncombustible mineral product complying with requirements of referenced quality standard and testing and inspecting agency for fire-protection rating indicated.
 2. Blocking: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated as needed to eliminate through-bolting hardware.
 3. Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.

- a. Screw-Holding Capability: 550 lbf per WDMA T.M.-10.

2.4 VENEERED-FACED DOORS FOR TRANSPARENT FINISH

A. Interior Solid-Core Doors:

1. Grade: Custom (Grade A faces).
2. Species: Red oak.
3. Cut: Plain sliced (flat sliced).
4. Match between Veneer Leaves: Book match.
5. Assembly of Veneer Leaves on Door Faces: Running match.
6. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
7. Room Match: Match door faces within each separate room or area of building. Corridor-door faces do not need to match where they are separated by 10 feet or more.
8. Room Match: Provide door faces of compatible color and grain within each separate room or area of building.
9. Exposed Vertical and Top Edges: Same species as faces or a compatible species - edge Type A.
10. Stiles (and Tops): Provide 1-7/16-inch two-ply stiles (and tops) with minimum 1/4-inch solid lumber outer plies. Veneered edges will not be accepted. Wood to match veneer.
11. Core: Particleboard.

2.5 CONSTRUCTION: FIVE PLIES. STILES AND RAILS ARE BONDED TO CORE, THEN ENTIRE UNIT ABRASIVE PLANED BEFORE VENEERING. LOUVERS AND LIGHT FRAMES

- ### **A. Wood Beads for Light Openings in Wood Doors: Provide manufacturer's standard wood beads as follows unless otherwise indicated.**
1. Wood Species: Same species as door faces.
 2. Profile: Flush rectangular beads.
 3. At wood-core doors with 20-minute fire-protection ratings, provide wood beads and metal glazing clips approved for such use.

- B. Wood-Veneered Beads for Light Openings in Fire-Rated Doors: Manufacturer's standard wood-veneered noncombustible beads matching veneer species of door faces and approved for use in doors of fire-protection rating indicated. Include concealed metal glazing clips where required for opening size and fire-protection rating indicated.

2.6 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
 - 1. Comply with requirements in NFPA 80 for fire-rated doors.
- B. Factory machine doors for hardware that is not surface applied, including drilling pilot holes for hinge screws and lock fronts. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.
 - 1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.
 - 2. Metal Astragals: Factory machine astragals and formed-steel edges for hardware for pairs of fire-rated doors.
 - 3. Factory prepare doors receiving templated mortised and electric hardware in accordance with Door Hardware Schedule. Field modification of mortised and electric hardware not acceptable in accordance with NFPA 80, Section 4.1.3.
- C. Openings: Cut and trim openings through doors in factory.
 - 1. Light Openings: Trim openings with moldings of material and profile indicated.
 - 2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Division 08 Section "Glazing."

2.7 FACTORY FINISHING

- A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
 - 1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.
- B. Finish doors at factory.
- C. Finish doors at factory that are indicated to receive transparent finish. Field finish doors indicated to receive opaque finish.
- D. Finish doors at factory where indicated in schedules or on Drawings as factory finished.
- E. Transparent Finish:
 - 1. Grade: Custom.

2. Finish: AWI's, AWMAC's, and WI's "Architectural Woodwork Standards" System 11, catalyzed polyurethane.
3. Staining: Match Architect's sample.
4. Effect: Semi-filled finish, produced by applying an additional finish coat to partially fill the wood pores.
5. Sheen: Semi-gloss.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames before hanging doors.
 1. Verify that 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.

3.2 INSTALLATION

- A. Hardware: For installation, see Division 08 Section "Door Hardware."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.
 1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.
 2. Install smoke- and draft-control doors according to NFPA 105.
- C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 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 081416

SECTION 081433 - STILE AND RAIL WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interior stile and rail wood doors.
 - 2. Finishing stile and rail wood doors.
 - 3. Fitting stile and rail wood doors to frames and machining for hardware.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include details of construction.
 - 2. Include factory-finishing specifications.
- B. Shop Drawings: For stile and rail wood doors. Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data, including those for stiles, rails, panels, and moldings (sticking); and other pertinent data, including the following:
 - 1. Dimensions of doors for factory fitting.
 - 2. Locations and dimensions of mortises and holes for hardware.
 - 3. Undercuts.
 - 4. Requirements for veneer matching.
 - 5. Doors to be factory finished and finish requirements.
- C. Samples for Verification: Corner sections of doors, approximately 8 by 10 inches, with door faces and edgings representing typical range of color and grain for each species of veneer and solid lumber required. Finish Sample with same materials proposed for factory-finished doors.

1.3 INFORMATIONAL SUBMITTALS

- A. Sample Warranty: For special warranty.
- B. Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in opaque plastic bags or cardboard cartons.
- C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 25 and 55 percent during remainder of construction period.

1.6 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship, or have warped (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section, within specified warranty period.
 - 1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
 - 2. Warranty shall be in effect during the following period of time from date of Substantial Completion:
 - a. Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain stile and rail wood doors from single manufacturer.

2.2 MATERIALS

- A. General: Use only materials that comply with referenced standards and other requirements specified.
 - 1. Assemble interior doors, including components, with either dry-use or wet-use adhesives complying with ASTM D 5572 for finger joints and with ASTM D 5751 for joints other than finger joints.
- B. Panel Products: Any of the following unless otherwise indicated:
 - 1. Particleboard made from wood particles, with binder containing no urea-formaldehyde, complying with ANSI A208.1, Grade M-2.
 - 2. Medium-density fiberboard made from wood fiber, with binder containing no urea-formaldehyde, complying with ANSI A208.2, Grade 130.
 - 3. Hardboard complying with ANSI A135.4.
 - 4. Veneer-core plywood, made with adhesive containing no urea-formaldehyde.

2.3 INTERIOR STILE AND RAIL WOOD DOORS

- A. Interior Stile and Rail Wood Doors: Interior custom doors complying with the AWI's, AWMAC's, and WI's "Architectural Woodwork Standards," and with other requirements specified.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Algoma Hardwoods, Inc.
 - b. Eggers Industries.
 - c. Marshfield DoorSystems, Inc.
 2. Panel Designs: Indicated on Drawings. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
 3. Grade: Custom.
 4. Finish: Transparent.
 5. Wood Species and Cut for Transparent Finish: Red oak, quarter sawed/sliced stiles and rails, plain sawed/sliced panels.
 6. Door Construction for Transparent Finish:
 - a. Stile and Rail Construction: Clear lumber; may be edge glued for width. Select lumber for similarity of grain and color and arrange for optimum match between adjacent pieces.
 - b. Flat-Panel Construction: Veneered, wood-based panel product.
 7. Stile and Rail Widths: As indicated.
 8. Flat-Panel Thickness: 1/2 inch.
 9. Provide AWI Quality Certification Labels indicating that doors comply with requirements of grades specified.

2.4 STILE AND RAIL WOOD DOOR FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels unless otherwise indicated:
1. Clearances: Provide 1/8 inch at heads, jambs, and between pairs of doors. Provide 1/2 inch from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide not more than 3/8 inch from bottom of door to top of threshold.
 - a. Comply with NFPA 80 for fire-rated doors.
 2. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.
- 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 measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.

2.5 FINISHING

- A. Finish wood doors at factory.
- B. For doors indicated to be factory finished, comply with the AWT's, AWMAC's, and WT's "Architectural Woodwork Standards," and with other requirements specified.
 1. Finish faces and all four edges of doors, including mortises and cutouts. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.
- C. Transparent Finish:
 1. Grade: Custom.
 2. Finish: AWT's, AWMAC's, and WT's "Architectural Woodwork Standards" System 11, catalyzed polyurethane.
 3. Staining: As selected by Architect from manufacturer's full range.
 4. Effect: Semifilled finish, produced by applying an additional finish coat to partially fill the wood pores.
 5. Sheen: Semigloss.

PART 3 - EXECUTION

3.1 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.

3.2 INSTALLATION

- A. Hardware: For installation, see Section 087100 "Door Hardware."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
- C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- D. Factory -Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or 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 081433

SECTION 083113 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes access doors and frames for walls and ceilings.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, fire ratings, material descriptions of individual components and profiles, and finishes.
- B. Product Schedule: For access doors and frames. Use same designations indicated on Drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Access Doors and Frames: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection and temperature-rise limit ratings indicated, according to NFPA 252 or UL 10B.

2.2 ACCESS DOORS AND FRAMES

- A. Flush Access Doors with Concealed Flanges:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Acudor Products, Inc.
 - b. Babcock-Davis.
 - c. JL Industries, Inc.; a division of the Activar Construction Products Group.
 - d. Larsens Manufacturing Company.
 - e. Milcor; Commercial Products Group of Hart & Cooley, Inc.
 - f. Nystrom, Inc.
 - 2. Description: Face of door flush with frame; with concealed flange for gypsum board installation and concealed hinge.
 - 3. Locations: Wall and ceiling.
 - 4. Door Size: As required.
 - 5. Uncoated Steel Sheet for Door: Nominal 0.060 inch , 16 gage, factory primed.

6. Stainless Steel Sheet for Door: Nominal 0.062 inch (1.59 mm), 16 gage, ASTM A480/A480M No. 4 finish.
7. Frame Material: Same material and thickness as door.
8. Latch and Lock: Cam latch, screwdriver operated or Cam latch, key operated in public areas.

2.3 FIRE-RATED ACCESS DOORS AND FRAMES

A. Fire-Rated, Flush Access Doors with Concealed Flanges:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Acudor Products, Inc.
 - b. Babcock-Davis.
 - c. JL Industries, Inc.; a division of the Activar Construction Products Group.
 - d. Nystrom, Inc.
2. Description: Door face flush with frame, with a core of mineral-fiber insulation enclosed in sheet metal; with concealed flange for gypsum board installation, self-closing door, and concealed hinge.
3. Locations: Wall and ceiling.
4. Door Size: As required.
5. Fire-Resistance Rating: Not less than that of adjacent construction.
6. Temperature-Rise Rating: 450 deg F at the end of 30 minutes.
7. Uncoated Steel Sheet for Door: Nominal 0.036 inch , 20 gage, factory primed.
8. Frame Material: Same material, thickness, and finish as door.
9. Latch and Lock: Self-closing, self-latching door hardware, operated by key, with interior release.

2.4 MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Steel Sheet: Uncoated or electrolytic zinc coated, ASTM A 879/A 879M, with cold-rolled steel sheet substrate complying with ASTM A 1008/A 1008M, Commercial Steel (CS), exposed.
- C. Stainless Steel Plate, Sheet, and Strip: ASTM A240/A240M or ASTM A666, Type 304. Remove tool and die marks and stretch lines, or blend into finish.
- D. Stainless Steel Flat Bars: ASTM A666, Type 304. Remove tool and die marks and stretch lines, or blend into finish.

- E. Frame Anchors: Same material as door face.
- F. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

2.5 FABRICATION

- A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.
- B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish mounting holes, attachment devices and fasteners of type required to secure access doors to types of supports indicated.
 - 1. For concealed flanges with drywall bead, provide edge trim for gypsum panels securely attached to perimeter of frames.
 - 2. For concealed flanges with plaster bead for full-bed plaster applications, provide zinc-coated expanded-metal lath and exposed casing bead welded to perimeter of frames.
- D. Latch and Lock Hardware:
 - 1. Quantity: Furnish number of latches and locks required to hold doors tightly closed.
 - 2. Keys: Furnish two keys per lock and key all locks alike.

2.6 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. 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.
- D. Painted Finishes: Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
 - 1. Factory Primed: Apply manufacturer's standard, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.
- E. Stainless Steel Finishes:

1. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
2. Polished Finish: ASTM A480/A480M No. 4 finish. Grind and polish surfaces to produce uniform finish, free of cross scratches.
 - a. Run grain of directional finishes with long dimension of each piece.
 - b. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

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 INSTALLATION

- A. Comply with manufacturer's written instructions for installing access doors and frames.

3.3 ADJUSTING

- A. Adjust doors and hardware, after installation, for proper operation.

END OF SECTION 083113

SECTION 087100 – DOOR HARDWARE

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes furnishing, installation and commissioning of door hardware for doors specified in “Hardware Sets” and required by actual conditions: including screws, bolts, expansion shields, electrified door hardware, and other devices for proper application of hardware.
- B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- C. Related Divisions:
 - 1. Division 08 Openings
 - 2. Division 09 Finishes

1.02 REFERENCES

- A. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI):
 - 1. ANSI/BHMA A156.1 Butts & Hinges (2016)
 - 2. ANSI/BHMA A156.3 Exit Devices (2014)
 - 3. ANSI/BHMA A156.4 Door Controls – Closers (2013)
 - 4. ANSI/BHMA A156.6 Architectural Door Trim (2015)
 - 5. ANSI/BHMA A156.7 Template Hinge Dimensions (2016)
 - 6. ANSI/BHMA A156.8 Door Controls – Overhead Stops and Holders (2015)
 - 7. ANSI/BHMA A156.13 Mortise Locks & Latches (2012)
 - 8. ANSI/BHMA A156.16 Auxiliary Hardware (2013)
 - 9. ANSI/BHMA A156.18 Materials & Finishes (2016)
 - 10. ANSI/BHMA A156.22 Door Gasketing Systems (2012)
 - 11. ANSI/BHMA A156.28 Keying Systems (2013)
- B. International Code Council/American National Standards Institute (ICC/ANSI)/ADA:
 - 1. ICC/ANSI A117.1 Standards for Accessible and Usable Buildings and Facilities 2006
- C. Underwriters Laboratories, Inc. (UL):
 - 1. UL 10C Positive Pressure Fire Test of Door Assemblies.
 - 2. UL 1784 Air Leakage Test of Door Assemblies.
 - 3. UL 294 Access Control System Units
- D. Door and Hardware Institute (DHI):
 - 1. DHI Publications – Keying Systems and Nomenclature (1989).
 - 2. DHI Publication – Abbreviations and Symbols.
 - 3. DHI Publication – Installation Guide for Doors and Hardware.
 - 4. DHI Publication – Sequence and Format of Hardware Schedule (1996).
- E. National Fire Protection Agency (NFPA):
 - 1. NFPA 70 National Electrical Code 2008

2. NFPA 80 Standard for Fire Doors and Other Opening Protectives 2007
3. NFPA 101 Life Safety Code 2006
4. NFPA 105 Standard for the Installation of Smoke Door Assemblies 2007

1.03 SUBMITTALS

- A. Submit in accordance with Conditions of the Contract and Division 1 Administrative Requirements and Submittal Procedures Section.
- B. Shop Drawings:
 1. Organize hardware schedule in vertical format as illustrated in DHI Publications Sequence and Formatting for the Hardware Schedule. Include abbreviations and symbols page according to DHI Publications Abbreviations and Symbols. Complete nomenclature of items required for each door opening as indicated.
 2. Coordinate final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of hardware.
 3. Architectural Hardware Consultant (AHC), as certified by DHI, who will affix seal attesting to completeness and correctness, including the review of the hardware schedule prior to submittal.
- C. Submit manufacturer's catalog sheet on design, grade, and function of items listed in hardware schedule. Identify specific hardware item per sheet, provide an index, and cover sheet.
- D. Templates:
 1. Upon final approval of the architectural hardware schedules, submit one set of complete templates for each hardware item to the door manufacturers, frame manufacturers, and the installers. Date and index these 8-1/2 inch x 11 inch papers in a three ring binder, including detailed lists of the hardware location requirements for mortised and surface applied hardware within fourteen days of receiving approved door hardware submittals.
- E. Closeout Submittals: Submit to Owner in a three-ring binder or CD if requested.
 1. Warranties.
 2. Maintenance and operating manual.
 3. Maintenance service agreement.
 4. Record documents.
 5. Copy of approved hardware schedule.
 6. Copy of approved keying schedule with bitting list.
 7. Door hardware supplier name, phone number, and fax number.

1.04 QUALITY ASSURANCE

- A. Listed and labeled electrified door hardware as defined in NFPA 70, Article 100, by a testing agency acceptable to authority having jurisdiction.
- B. Hardware supplier will employ an Architectural Hardware Consultant (AHC) as certified by DHI and a member of the seal program who will be available at reasonable times during course of work for Project hardware consultation.

- C. Door hardware conforming to ICC/ANSI A117.1: Handles pulls, latches locks and operating devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
- D. Fired Rated Door Assemblies: Where fire-rated door assemblies are indicated, provide door hardware rated for use in assemblies complying with NFPA 80 that are listed and/or labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL 10C, unless otherwise indicated.
- E. Fire Door Inspection: Prior to receiving certificate of occupancy have fire rated doors inspected by an independent Certified Fire and Egress Door Assembly Inspector (FDAI), as certified by Intertek (ITS), a written report be submitted to Owner and Contractor. Doors failing inspection must be adjusted, replaced or modified to be within appropriate code requirements.
- F. Smoke and Draft Control Door Assemblies: Where smoke and draft control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
- G. Door hardware certified to ANSI/BHMA standards as noted, participate and be listed in BHMA Certified Products Directory.
- H. Substitution request: create a comparison chart that includes the testing information as well as the warranty for both the specified product and the proposed substitution. Include the reason for requesting the substitution, clear catalog copy highlighting the proposed product and options, compliance statement, technical data, product warranty and lead time, to show how the proposed can meet or exceed established level of design, function, and quality. Approval of request is at the discretion of the owner, architect, and their designated consultants and will be addressed via addendum prior to bid date.
- I. Meetings: Comply with requirements in Division 1 and as follows:
 - 1. Keying Meeting
 - a. Within fourteen days of receipt of approved door hardware submittals, contact Owner with representative from hardware supplier to establish a keying conference. Verify keyway, visual key identification, number of master keys and keys per lock. Provide keying system per Owner's instructions.
 - a. equipment and facilities needed to make progress and avoid delays.
- J. Installer Qualifications: Specialized in performing installation of this Section and have five years minimum documented experience.
- K. Hardware listed in 3.07 – Hardware Schedule is intended to establish minimum level of design, type, function and grade of hardware to be used.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Provide clean, dry and secure room for hardware delivered to Project but not yet installed. Shelf hardware off of the floor and with larger items of hardware being stored on wooden pallets. Arrange locksets and keyed cylinders by opening number. Organize the balance of hardware by

brand, model of hardware, and hardware set number. Leave the door markings of the hardware visible for installers.

- B. Furnish hardware that is not bulk packed with each unit marked and numbered in accordance with approved finish hardware schedule. Include architect's opening number, hardware set number, and item number for each type of hardware. Include keyset symbols and corresponding hardware component for keyed products.
- C. Pack each item complete with necessary parts and fasteners in manufacturer's original packaging.
- D. Deliver architectural hardware to the job site according to the phasing agreed upon in the pre-installation meeting. Inventory the delivery with the supplier's assistance. Immediately note shortages and damages on the shipping receipts and bill of lading. Coordinate replacement or repair with the supplier.
- E. Deliver permanent keys and related accessories directly to Owner via registered mail or overnight package service. Establish the instructions for delivery to Owner at "Keying Conference."
- F. Waste Management and Disposal: Separate waste materials for use or recycling in accordance with Division 1.

1.06 WARRANTY

- A. General Warranty: Owner may have under provisions of the Contract Documents and be an addition and run concurrently with other warranties made by Contractor under requirements of the Contract documents.
- B. Special Warranty: Warranties specified in this article will not deprive Owner of other rights.
 - 1. Ten years for manual door closers.
 - 2. Five years for mortise, auxiliary and bored locks.
 - 3. Five years for exit devices.
- C. Replace or repair defective products during warranty period in accordance with manufacturer's warranty at no cost to Owner. There is no warranty against defects due to improper installation, abuse, and failure to exercise normal maintenance.
- D. Maintenance Tool and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, removal and replacement of door hardware.

PART 2 – PRODUCTS

2.01 HINGES

- A. Hinges, electric hinges, and self-closing hinges of one manufacturer as listed for continuity of design and consideration of warranty.
- B. Standards: Products to be certified and listed by the following:

1. Butts and Hinges: ANSI/BHMA A156.1.
2. Template Hinge Dimensions: ANSI/BHMA A156.7.
3. Self-Closing Hinges: ANSI/BHMA A156.17.

C. Butt Hinges:

1. Hinge weight and size unless otherwise indicated in hardware sets:
 - a. Doors up to 36" wide and up to 1-3/4" thick provide hinges with a minimum thickness of .134" and a minimum of 4-1/2" in height.
 - b. Doors from 36" wide up to 42" wide and up to 1-3/4" thick provide hinges with a minimum thickness of .145" and a minimum of 4-1/2" in height.
 - c. For doors from 42" wide up to 48" wide and up to 1-3/4" thick provide hinges with a minimum thickness of .180" and a minimum of 5" in height.
 - d. Doors greater than 1-3/4" thick provide hinges with a minimum thickness of .180" and a minimum of 5" in height.
 - e. Width of hinge is to be minimum required to clear surrounding trim.
2. Base material unless otherwise indicated in hardware sets:
 - a. Exterior Doors: 304 Stainless Steel, Brass or Bronze material.
 - b. Interior Doors: Steel material.
 - c. Fire Rated Doors: Steel or 304 Stainless Steel materials.
 - d. Stainless Steel ball bearing hinges to have stainless steel ball bearings. Steel ball bearings are unacceptable.
3. Quantity of hinges per door unless otherwise stated in hardware sets:
 - a. Doors up to 60" in height provide 2 hinges.
 - b. Doors 60" up to 90" in height provide 3 hinges.
 - c. Doors 90" up to 120" in height provide 4 hinges.
 - d. Doors over 120" in height add 1 additional hinge per each additional 30" in height.
 - e. Dutch doors provide 4 hinges.
4. Hinge design and options unless otherwise indicated in hardware sets:
 - a. Hinges are to be of a square corner five-knuckle design, flat button tips and have ball bearings unless otherwise indicated in hardware sets.
 - b. Out-swinging exterior and out-swinging access controlled doors are required to have Non-Removable Pins (NRP) to prevent removal of pin while door is in closed position.
 - c. When full width of opening is required, use hinges that are designed to swing door completely from opening when door is opened to 95 degrees.
 - d. When shims are necessary to correct frame or door irregularities, provide metal shims only.

5. Acceptable Manufacturers:

	Standard Weight	Heavy Weight
Hager	BB1279	BB1168
Bommer	BB5000	BB5004
McKinney	TA2714	T4A3786

2.02 FLUSH BOLTS

- A. Flush bolts of one manufacturer as listed for continuity of design and consideration of warranty.

- B. Standards: Manufacturer to be listed by the following: Auxiliary Hardware: ANSI/BHMI A156.16.
- C. Labeled openings: Provide automatic or constant latching flush bolts per hardware schedule for inactive leaf of pairs of doors. Provide dust proof strikes for bottom bolt.
- D. Non-Labeled openings: Provide two flush bolts for inactive leaf of pairs of doors per hardware schedule. Provide extension rods so that the center line of the top flush bolt is not more than 78" above the finish floor. Provide dust proof strike from bottom bolt.
- E. Acceptable Manufacturers:

	Manual Flush Bolt	Auto Flush Bolt	Dust Proof Strike
Hager	282D	291D	280X
Rockwood	555	1942	570
Trimco	3917	3815	3911

2.03 LOCKS AND LATCHES

- A. Locks and latches of one manufacturer as listed for continuity of design and consideration of warranty.
- B. Standards: Product to be certified and listed by following:
1. ANSI/BHMA A156.13 Series 1000 Certified to Grade 1 for Operational and Security.
 2. UL/cUL Labeled and listed up to 3 hours for single doors up to 48" in width and up to 96" in height.
 3. UL10C/UBC 7-2 Positive Pressure Rated.
 4. ICC/ANSI A117.1.
- C. Lock and latch function numbers and descriptions of manufacturer's series as listed in hardware sets.
- D. Material and Design:
1. Lock cases from fully wrapped, 12 gauge steel, zinc dichromate for corrosion resistance.
 2. Non-handed, field reversible without opening lock case.
 3. Break-away spindles to prevent unlocking during forced entry or vandalism.
 4. Levers, zinc cast, forged brass or stainless steel and plated to match finish designation in hardware sets.
 5. Sectional Roses, solid brass or stainless steel material and have a minimum diameter of 2-7/16".
 6. Armor fronts, self-adjusting to accommodate a square edge door or a standard 1/8" beveled edge door.
- E. Latch and Strike:
1. Stainless steel latch bolt with minimum of 3/4" throw and deadlocking for keyed and exterior functions.
 2. Strike is to fit a standard ANSI A115 prep measuring 1-1/4" x 4-7/8" with proper lip length to protect surrounding trim.

3. Deadbolts to be 1-3/4" total length with a minimum of a 1" throw and 3/4" internal engagement when fully extended and made of stainless steel material.

F. Acceptable Manufacturers:

Sargent – NO SUBSTITUTION	8200 Series
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2.04 EXIT DEVICES

- A. Exit Devices of one manufacturer as listed for continuity of design and consideration of warranty. Touchpad type, finish to match balance of door hardware.
- B. Standards: Manufacturer to be certified and/or listed by the following:
 1. BHMA Certified ANSI A156.3 Grade 1.
 2. UL/cUL Listed for up to 3 hours for "A" labeled doors.
 3. UL10C/UBC 7-2 Positive Pressure Rated.
 4. UL10B Neutral Pressure Rated.
 5. UL 305 Listed for Panic Hardware.
 6. 2007 Florida Building Code Certification Number: FL9481.1.
 7. ANSI/BHMA A250.13 Severe Windstorm Resistant Component.
- C. Material and Design:
 1. Provide exit devices with actuators that extend a minimum of one-half of door width.
 2. Where trim is indicated in hardware sets provide the lever design to match design of lock levers.
 3. Exit device to mount flush with door.
 4. Latchbolts:
 - a. Rim device – 3/4" throw, Pullman type with automatic dead-latching, stainless steel
 - b. Surface vertical rod device – Top 1/2" throw, Pullman type with automatic dead-latching, stainless steel. Bottom 1/2" throw, Pullman type, held retracted during door swing, stainless steel.
 5. Fasteners: Wood screws, machine screws, and thru-bolts.
- D. Lock and Latch Functions: Function numbers and descriptions of manufacturer's series and lever styles indicated in door hardware sets.

E. Acceptable Manufactures:

Hager	4500 Series	
Von Duprin	99 Series	
Sargent	80 Series	

2.05 CYLINDERS AND KEYING

- A. Cylinders of one manufacturer as listed for continuity of design and consideration of warranty.
- B. Products to be certified and listed by the following:
 1. Auxiliary Locks: ANSI/BHMA A156.5
 2. DHI Handbook "Keying systems and nomenclature" (1989)

C. Cylinders:

1. Manufacturer's standard tumbler type, AS DIRECTED BY OWNER.
2. Furnish with cams/tailpieces as required for locking device that is being furnished for project.

D. Keying:

1. Copy of Owners approved keying schedule submitted to Owner and Architect with documentation of which keying conference was held and Owner's sign-off.
2. Provide a bitting list to Owner of combinations as established, and expand to twenty-five percent for future use or as directed by Owner.
3. Key into Owner's existing keying system if applicable.
4. Keys to be shipped to Owner's Representative, individually tag per keying conference.
5. Provide visual key control identification on keys.
6. Provide construction keyed cylinders and 40 keys as required per the keying meeting.

E. Acceptable Manufacturers:

Sargent – NO SUBSTITUTION

2.06 CLOSERS

- A. Closers of one manufacturer as listed for continuity of design and consideration of warranty, unless otherwise indicated on hardware schedule, comply with manufacturer's recommendations for size of closer, depending on width of door, frequency of use, atmospheric pressure, ADAAG requirement, and fire rating.

B. Standards: Manufacturer to be certified and or listed by the following:

1. BHMA Certified ANSI A156.4 Grade 1.
2. ADA Complaint ANSI A117.1.
3. UL/cUL Listed up to 3 hours.
4. UL10C Positive Pressure Rated.
5. UL10B Neutral Pressure Rated.

C. Material and Design:

1. Provide cast iron non-handed bodies with full plastic covers.
2. Closers will have separated staked adjustable valve screws for latch speed, sweep speed, and backcheck.
3. Provide Tri-Pack arms and brackets for regular arm, top jamb, and parallel arm mounting.
4. One-piece seamless steel spring tube sealed in hydraulic fluid.
5. Double heat-treated steel tempered springs.
6. Precision-machined heat-treated steel piston.
7. Triple heat-treated steel spindle.
8. Full rack and pinion operation.

D. Mounting:

1. Out-swing doors use surface parallel arm mount closers except where noted on hardware schedule.

2. In-swing doors use surface regular arm mount closers except where noted on hardware schedule.
 3. Provide brackets and shoe supports for aluminum doors and frames to mount fifth screw.
 4. Furnish drop plates where top rail conditions on door do not allow for mounting of closer and where backside of closer is exposed through glass.
- E. Size closers in compliance with requirements for accessibility (ADAAG). Comply with following maximum opening force requirements.
1. Interior hinged openings: 5.0 lbs.
 2. Fire-rated and exterior openings use minimum opening force allowable by authority having jurisdiction.
- F. Fasteners: Provide self-reaming, self-tapping wood and machine screws, and sex nuts and bolts for each closer.
- G. Acceptable manufacturers:

Hager	5100 Series
LCN	4040XP Series
Sargent	281 Series

2.07 PROTECTIVE TRIM

- A. Protective trim of one manufacturer as listed for continuity of design and consideration of warranty.
- B. Size of protection plate: single doors, size two inches less door width (LDW) on push side of door, and one inch less door width on pull side of door. For pairs of doors, size one inch less door width (LDW) on push side of door, and 1/2 inch on pull side of door. Adjust sizes to accommodate accompanying hardware, such as, edge guards, astragals and others.
1. Kick Plates 10" high or sized to door bottom rail height.
- C. Products to be certified and listed by the following:
1. Architectural Door Trim: ANSI/BHMA A156.6.
 2. UL.
- D. Material and Design:
1. 0.050" gage stainless steel.
 2. Corners square, polishing lines or dominant direction of surface pattern so they run across door width of plate.
 3. Bevel top, bottom, and sides uniformly leaving no sharp edges.
 4. Countersink holes for screws. Space screw holes so they are no more than eight inches CTC, along a centerline not over 1/2" in from edge around plate. End screws maximum of 0.53" from corners.
- E. UL label stamp required on protection plates when top of plate is more than 16 inches above bottom of door on fire rated openings. Verify door manufacturer's UL listing for maximum height and width of protection plate to be used.

F. Acceptable Manufacturers:

Hager	190S
Trimco	
Burns	

2.08 STOPS AND HOLDERS

- A. Stops and holders of one manufacturer as listed for continuity of design and consideration of warranty.
- B. Wall Stops: Provide door stops wherever necessary to prevent door or hardware from striking an adjacent partition or obstruction. Provide wall stops when possible. Door stops and holders mounted in concrete floor or masonry walls have stainless steel machine screws and lead expansion shields.
- C. Products to be certified and listed by the following:
1. Auxiliary Hardware: ANSI/BHMA A156.16.

D. Acceptable Manufacturers:

	Convex	
Hager	232W	
Rockwood		
Burns		

- E. Overhead Stops and Holders: Provide overhead stops and holders for doors that open against equipment, casework sidelights and other objects that would make wall stops/holders and floor stops/holders inappropriate. Provide sex bolt attachments for mineral core wood door applications.
- F. Products to be certified and listed by the following:
1. Overhead Stops and Holders: ANSI/BHMA A156.8 Grade 1.

G. Acceptable Manufacturers:

	Heavy Duty Surface	
Hager	7000 SRF Series	
Glynn Johnson	90 SRF Series	
Sargent	590 Series	

2.09 ELECTROMAGNETIC HOLDERS

- A. Electromagnetic holders of one manufacturer as listed for continuity of design and consideration of warranty.
- B. Products to be certified and listed by the following:
1. ANSI A156.15 Grade 1.
 2. UL/ULC Listed.

3. California State Fire Marshall listed (CSFM).
4. City of New York MEA approved.

C. Material and Design:

1. Provide electromagnetic holders where self-closing fire doors and smoke barrier doors are required to be held open. Electromagnetic holders to be fail-safe: when electrical current is interrupted, doors release to close automatically. Holding force 25-40 lbs.

D. Acceptable Manufacturers:

Hager	380 Series
LCN	
Rixson	

2.10 DOOR GASKETING AND WEATHERSTRIP

- A. Door gasketing and weatherstrip of one manufacturer as listed for continuity of design and consideration of warranty.
- B. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing where indicated on hardware schedule. Provide noncorrosive fasteners for exterior applications.
 1. Perimeter gasketing: Apply to head and jamb, forming seal between door and frame.
 2. Meeting stile gasketing: Fasten to meeting stiles, forming seal when doors are in closed position.
 3. Door buttons: Apply to bottom of door, forming seal with threshold or floor when door is in closed position.
 4. Sound Gasketing: Cutting or notching for stop mounted hardware not permitted.
 5. Drip Guard: Apply to exterior face of frame header. Lip length to extend 4" beyond width of door.
- C. Products to be certified and listed by the following:
 1. Door Gasketing and Edge Seal Systems: ANSI/BHMA A156.22.
 2. BHMA certified for door sweeps, automatic door bottoms, and adhesive applied gasketing.
- D. Smoke-Labeled Gasketing: Comply with NFPA 105 listed, labeled, and acceptable to Authorities Having Jurisdiction, for smoke control indicated.
 1. Provide smoke-labeled gasketing on 20 minute rated doors and on smoke rated doors.
- E. Fire-Rated Gasketing: Comply with NFPA 80 listed, labeled, and acceptable to Authorities Having Jurisdiction, for fire ratings indicated.
- F. Refer to Section 08 1416 Wood Doors for Category A or Category B. Comply with UBC 7-2 and UL10C positive pressure where frame applied intumescent seals are required.

G. Acceptable Manufacturers:

1. Perimeter Gasketing:

		Adhesive Applied
Hager		726
K.N. Crowder		
Reese		

2. Meeting Stile Weatherstrip:

Hager	802S
K.N. Crowder	
Reese	

3. Overlapping Astragal:

Hager	835S
K.N. Crowder	
Reese	
National Guard	NPG 552

2.11 SILENCERS

- A. Where smoke, light, or weather seal are not required, provide three silencers per single door frame, two per double door frame and four per Dutch door frame.
- B. Products to be certified and listed by the following:
1. Auxiliary Hardware: ANSI/BHMA A156.16

C. Acceptable Manufacturers:

	Hollow Metal Frame	
Hager	307D	
Rockwood		
Trimco		

2.12 KEY CABINET

- A. Provide key cabinet; surface mounted to wall.
- B. Key control system:
1. Include two sets of key tags, hooks, labels, and envelopes.
 2. Contain system in metal cabinet with baked enamel finish.
 3. Capacity will be able to hold actual quantities of keys, plus 50 percent.
 4. Provide tools, instruction sheets, and accessories required to complete installation.

C. Acceptable Manufacturers:

Lund Equipment
Telkee Incorporated
Key Control

2.13 FINISHES

- A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if within range of approved samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within range of approved samples.
- B. Comply with base material and finish requirements indicated by ANSI/BHMA A156.18 designations in hardware schedule.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine doors and frames, with Installers present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

3.02 INSTALLATION

- A. Install hardware using manufactures recommended fasteners and installation instructions, at height locations and clearance tolerances that comply with:
 - 1. NFPA 80
 - 2. NFPA 105
 - 3. ICC/ANSI A117.1
 - 4. ANSI/BHMA A156.115 Hardware Preparation in Steel Doors and Steel Frames
 - 5. ANSI/BHMA A156.115W hardware Preparation in Wood Doors with Wood or Steel Frames
 - 6. DHI Publication – Installation Guide for Doors and Hardware
 - 7. Approved shop drawings
 - 8. Approved finish hardware schedule
- B. Install soffit mounted gaskets prior other soffit mounted hardware to provide a continuous seal around the perimeter of the opening without cutting or notching.
- C. Install door closers so they are on the interior of the room side of the door. Stairwell doors will have closers mounted on the stair side and exterior doors will be mounted on the interior side of the building.
- D. In drywall applications provide blocking material of sufficient type and size for hardware items that mount directly to the wall.

- E. Locate wall mounted bumper to contact the trim of the operating trim.
- F. Mount mop and kick plates flush with the bottom of the door and centered horizontally on the door.
- G. Set thresholds for exterior, and acoustical doors at sound control openings in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants" forming a tight seal between threshold and surface to which set.
- H. Anchor all components firmly into position and use anchoring devices furnished with the hardware item, unless otherwise specified.
- I. Do not install surface mounted items until finishes have been completed on substrates involved. Set unit level, plumb and true to line location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

3.03 FIELD QUALITY CONTROL

- A. Material supplier to schedule final walk through to inspect hardware installation ten (10) business days before final acceptance of Owner. Material supplier will provide a written report detailing discrepancies of each opening to General Contractor within seven (7) calendar days of walk through.

3.04 ADJUSTMENT, CLEANING, AND DEMONSTRATING

- A. Adjustment: Adjust and check each opening to ensure proper operation of each item of finish hardware. Replace items that cannot be adjusted to operate freely and smoothly or as intended for application at no cost to Owner.
- B. Cleaning: Clean adjacent surfaces soiled by hardware installation. Clean finish hardware per manufacturer's instructions after final adjustments have been made. Replace items that cannot be cleaned to manufacturer's level of finish quality at no cost to Owner.
- C. Conduct a training class for building maintenance personnel demonstrating the adjustment, operation of mechanical and electrical hardware. Special tools for finish hardware to be turned over and explained usage at the meeting.

3.05 PROTECTION

- A. Leave manufacturer's protective film intact and provide proper protection for all other finish hardware items that do not have protective material from the manufacture until Owner accepts project as complete.

3.06 HARDWARE SET SCHEDULE

- A. Intent of Hardware Groups
 - 1. Should items of hardware not specified be required for completion of the Work, furnish

- such items of type and quality comparable to adjacent hardware and appropriate for service required.
2. Where items of hardware aren't correctly specified and are required for completion of the Work, a written statement of such omission, error, or other discrepancy is required to be submitted to Architect, prior to date specified for receipt of bids for clarification by addendum; or, furnish such items in the type and quality established by this specification, and appropriate to the service intended.
- B. Guide: Door hardware items have been placed in sets which are intended to be a guide of design, grade, quality, function, operation, performance, exposure, and like characteristics of door hardware, and may not be complete. Provide door hardware required to make each set complete and operational.
- C. Hardware schedule does not reflect handing, backset, method of fastening, and like characteristics of door hardware and door operation.
- D. Review door hardware sets with door types, frames, sizes and details on drawings. Verify suitability and adaptability of items specified in relation to details and surrounding conditions.

Hardware Sets

Set #01

Doors: 100, 101, 102, 103, 104, 106, 107, 109, 111, 112

3 Hinge	BB1168 5 X 4 1/2 NRP	US26D	HA
1 Mortise Leverset	8215 LNJ	26D	SA
1 Convex Wall Stop	232W	US32D	HA
1 Weatherstrip	726 x LAR	S	HA
NOTE: Not required @ Pod A1B			
1 Weatherstrip	881S N x LAR	MIL	HA
NOTE: @ Pod A1B only			
1 Automatic Door Bottom	743S N x LAR	MIL	HA
NOTE: @ Pod A1B only			

Set #02

Doors: 100.1, 101.1, 102.1, 106.1, 107.1, 109.1

3 Hinge	BB1168 5 X 4 1/2 NRP	US26D	HA
1 Mortise Leverset	8215 LNJ	26D	SA
1 Overhead Door Stop	7016 SRF	ALM	HA
3 Metal Frame Silencer	307D	GREY	HA

Set #03

Doors: 103.1, 104.1, 108.1, 111.1, 112.1

St. Louis Veteran's Home Renovation
St. Louis, MO
State Project No. U2307-01
CannonDesign Project No. 005680.00

June 26, 2025
Issued for Bid

Set #03

3 Hinge	BB1168 5 X 4 1/2 NRP	US26D	HA
1 Mortise Leverset	8215 LNJ	26D	SA
1 Convex Wall Stop	232W	US32D	HA
3 Metal Frame Silencer	307D	GREY	HA

Set #04

Doors: 151

3 Hinge(s)	BB1168 5 X 4 1/2 NRP	US26D	HA
1 Mortise Lockset	72 8204 LNJ	26D	SA
1 Interchangeable Core	Match Existing	15	SA
1 Closer	5100	ALM	HA
1 Kick Plate	190S 12" x 2" LDW	US32D	HA
1 Convex Wall Stop	232W	US32D	HA
1 Weatherstrip	726 x LAR	S	HA

Set #05

Doors: 152, 154, 223, 225.2, E101, E102, E103, E104

1 All Existing Hardware	REUSE	BYOT
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Set #06

Doors: 153

6 Hinge	BB1279 4 1/2 x 4 1/2 NRP	US26D	HA
2 Flush Bolt	282D	US26D	HA
1 Dust Proof Strike	280X	US26D	HA
1 Mortise Lockset	72 8204 LNJ	26D	SA
1 Interchangeable Core	Match Existing	15	SA
2 Overhead Door Stop	7016 SRF	ALM	HA
1 Weatherstrip	726 x LAR	S	HA
1 Astragal	835S x LAR	USP	HA

Set #07

Doors: 155

3 Hinge	BB1279 4 1/2 x 4 1/2 NRP	US26D	HA
1 Mortise Lockset	72 8204 LNJ	26D	SA
1 Interchangeable Core	Match Existing	15	SA
1 Overhead Door Stop	7016 SRF	ALM	HA
1 Weatherstrip	726 x LAR	S	HA

St. Louis Veteran's Home Renovation
St. Louis, MO
State Project No. U2307-01
CannonDesign Project No. 005680.00

June 26, 2025
Issued for Bid

Set #08

Doors: 156, 157

6 Hinge	BB1279 4 1/2 x 4 1/2 NRP	US26D	HA
2 Flush Bolt	282D	US26D	HA
1 Dust Proof Strike	280X	US26D	HA
1 Mortise Lockset	72 8204 LNJ	26D	SA
1 Interchangeable Core	Match Existing	15	SA
2 Overhead Door Stop	7016 SRF	ALM	HA
1 Weatherstrip	726 x LAR	S	HA
1 Astragal	835S x LAR	USP	HA

Set #09

Doors: 158

3 Hinge	BB1279 4 1/2 x 4 1/2 NRP	US26D	HA
1 Mortise Lockset	72 8204 LNJ	26D	SA
1 Interchangeable Core	Match Existing	15	SA
1 Overhead Stop	SRF 7016 (Size 1)	32D	HA
1 Closer	5100 (Mount Push side of door)	ALM	HA
1 Bracket	5935	ALM	HA
1 Armor Plate	190S x 36" x 2" LDW x UL	US32D	HA
1 Protection Plate	190S 6" x 2" LDW	US32D	HA
1 Weatherstrip	726 x LAR	S	HA

Set #10 – NOT USED

Set #11

Doors: 201, 202, 221, 241, 242

3 Hinge	BB1279 4 1/2 X 4 1/2 NRP	US26D	HA
1 Mortise Lockset	72 8204 LNJ	26D	SA
1 Interchangeable Core	Match Existing	15	SA
1 Closer	5100	ALM	HA
1 Kick Plate	190S 12" x 2" LDW	US32D	HA
1 Convex Wall Stop	232W	US32D	HA
1 Weatherstrip	726 x LAR	S	HA

St. Louis Veteran's Home Renovation
St. Louis, MO
State Project No. U2307-01
CannonDesign Project No. 005680.00

June 26, 2025
Issued for Bid

Set #12

Doors: 210, 238

3 Hinge	BB1279 4 1/2 X 4 1/2 NRP	US26D	HA
1 Mortise Lockset	72 8204 LNJ	26D	SA
1 Interchangeable Core	Match Existing	15	SA
1 Closer	5100	ALM	HA
1 Armor Plate	190S x 36" x 2" LDW x UL	US32D	HA
1 Protection Plate	190S 6" x 2" LDW UL	US32D	HA
1 Convex Wall Stop	232W	US32D	HA
1 Weatherstrip	726 x LAR	S	HA

Set #13 – NOT USED

Set #14 - NOT USED

Set #15

Doors: 231

1 Interchangeable Core	Match Existing	15	SA
1 All Existing Hardware	REUSE		BYOT

Set #16

Doors: 204, 223, 232

1 Kick Plate	190S 12" x 2" LDW	US32D	HA
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Set #17

Doors: 205, 222, 237

1 Armor Plate	190S x 36" x 2" LDW x UL	US32D	HA
1 Protection Plate	190S 6" x 2" LDW	US32D	HA

Set #18

Doors: 206, 207, 208, 209, 239, 240

1 Protection Plate	190S 36" x 2" LDW	US32D	HA
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Set #19

Doors: 225.1

1 Armor Plate	190S x 36" x 2" LDW x UL	US32D	HA
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Set #20

Doors: 203, 223, 224, 233, 234, 235

Set #20

3 Hinge	BB1168 5 X 4 1/2 NRP	US26D	HA
1 Mortise Lockset	72 8237 LNJ	26D	SA
1 Interchangeable Core	Match Existing	15	SA
1 Closer	5100	ALM	HA
1 Kick Plate	190S 12" x 2" LDW	US32D	HA
1 Convex Wall Stop	232W	US32D	HA
1 Weatherstrip	726 x LAR	S	HA

NOTE: Door 224, no Kick Plate

Set #21

Doors: 230.1

3 Hinge	BB1279 4 1/2 X 4 1/2 NRP	US26D	HA
1 Mortise Leverset	8265 LNJ	26D	SA
1 Convex Wall Stop	232W	US32D	HA
3 Metal Frame Silencer	307D	GREY	HA
1 Kick Plate	190S 12" x 2" LDW	US32D	HA

Set #22 – NOT USED

Set #23

Doors: 200.1, 200.2, 200.3, 200.4, 228, E203, E204

6 Hinge	BB1168 5 X 4 1/2 NRP	US26D	HA
2 Exit Device	4501 F LBR FEC	US26D	HA
2 Closer	5100	ALM	HA
2 Mag Holder	380F	LS	HA
1 Weatherstrip	726 x LAR	S	HA
2 Astragal	552	PUTTY	NG

Set #24

Doors: 227, 229, 230

3 Hinge	BB1279 4 1/2 X 4 1/2	US26D	HA
1 Mortise Lockset	72 8237 LNJ	26D	SA
1 Interchangeable Core	Match Existing	15	SA
1 Closer	5100	ALM	HA
1 Kick Plate	190S 12" x 2" LDW (Door 230 ONLY)	US32D	HA
1 Kick Plate	190S 36" x 2" LDW (Doors 227 and 229 ONLY)	US32D	HA
1 Convex Wall Stop	232W	US32D	HA
1 Weatherstrip	726 x LAR	S	HA

St. Louis Veteran's Home Renovation
St. Louis, MO
State Project No. U2307-01
CannonDesign Project No. 005680.00

June 26, 2025
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END OF SECTION 087100

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
 - a. Doors.
 - 2. Glazing sealants and accessories.

1.2 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.

1.3 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.4 ACTION SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For glass and glazing products, from manufacturer.

1.6 QUALITY ASSURANCE

- A. 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.
- B. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- C. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

1.7 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.

1.8 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 (4.4 deg C).

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Glass: Obtain from single source from single manufacturer for each glass type.
 - 1. Obtain tinted glass from single source from single manufacturer.
 - 2. Obtain reflective-coated glass from single source from single manufacturer.
- B. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

2.2 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.

2.3 GLASS PRODUCTS, GENERAL

- A. 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."
- B. 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.

- C. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.
- D. Strength: Where float glass is indicated, provide annealed float glass, Kind HS heat-treated float glass, or Kind FT heat-treated float glass. Where heat-strengthened glass is indicated, provide Kind HS heat-treated float glass or Kind FT heat-treated float glass. Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.

2.4 GLASS PRODUCTS

- A. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
 - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

2.5 GLAZING GASKETS

- A. Dense Compression Gaskets: Molded or extruded gaskets of profile and hardness required to maintain watertight seal, made from the following:
 - 1. Silicone complying with ASTM C 1115.
- B. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned silicone gaskets complying with ASTM C 509, Type II, black; of profile and hardness required to maintain watertight seal.
 - 1. Application: Use where soft compression gaskets will be compressed by inserting dense compression gaskets on opposite side of glazing or pressure applied by means of pressure-glazing stops on opposite side of glazing.

2.6 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
 - 1. AAMA 804.3 tape, where indicated.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
 - 1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.

2.7 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

2.8 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.
- C. Grind smooth and polish exposed glass edges and corners.
- D. Do not attempt to cut, seam, nip or abrade tempered glass.

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. Inspect each glass unit immediately before installation. Do not install units with edge damage or face imperfections.
- C. 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.
 - 1. Where glass is installed in other building components, comply with requirements of component manufacturer for installation of glass in the applicable building component.
- B. 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.
- C. 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.
- D. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- E. 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.
- F. 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.
- G. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- H. Set glass lites with proper orientation so that coatings face exterior or interior as specified.

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. 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.
- G. Apply cap bead of elastomeric sealant over exposed edge of tape where fixed stop is located on exterior.

3.5 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. Immediately after installation, 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.
 - 1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.
- 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.

3.6 MONOLITHIC-GLASS SCHEDULE

- A. Glass Type GLI-1: Clear fully tempered float glass.
 - 1. Thickness: 6.0 mm.

St. Louis Veteran's Home Renovation
St. Louis, MO
State Project No. U2307-01
CannonDesign Project No. 005680.00

June 26, 2025
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2. Provide safety glazing labeling.

END OF SECTION 088000

SECTION 088813 - FIRE-RESISTANT GLAZING

PART 1 - GENERAL

1.1 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.

1.2 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of glass and glazing product, from manufacturer.

1.5 QUALITY ASSURANCE

- A. 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.

1.6 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.

1.7 WARRANTY

- A. Manufacturer's Special Warranty on Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Glass: Obtain from single source from single manufacturer for each glass type.
- B. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

2.2 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; deterioration of glazing materials; or other defects in construction.

2.3 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organization 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: "Laminated Glazing Reference Manual" and "Glazing Manual."
- B. Safety Glazing Labeling: Permanently mark glazing with certification label of the Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, glass thickness, and safety glazing standard with which glass complies.

2.4 GLASS PRODUCTS

- A. Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.
- B. Laminated Glass: ASTM C 1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
 - 1. Construction: Laminate glass with polyvinyl butyral interlayer unless fire-protection or fire-resistance rating is based on another product.
 - 2. Interlayer Thickness: Provide thickness as needed to comply with requirements.
 - 3. Interlayer Color: Clear unless otherwise indicated.

2.5 FIRE-PROTECTION-RATED GLAZING

- A. Fire-Protection-Rated Glazing Labeling: Permanently mark fire-protection-rated glazing with certification label of a testing agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name; test standard; whether glazing is permitted to be used in doors or openings; if permitted in openings, whether or not glazing has passed the hose-stream test;

whether or not glazing meets 450 deg F (250 deg C) temperature-rise limitation; and the fire-resistance rating in minutes.

- B. Laminated Glass with Intumescent Interlayers: Laminated glass made from multiple plies of uncoated, ultraclear float glass; with intumescent interlayers; and complying with 16 CFR 1201, Category II.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Pilkington North America; Pyrostop.
 - b. Technical Glass Products; Pyrostop.
 - c. Vetrotech Saint-Gobain; Contraflam.

2.6 GLAZING ACCESSORIES

- A. Provide glazing gaskets, glazing sealants, glazing tapes, setting blocks, spacers, edge blocks, and other glazing accessories that are compatible with glazing products and each other and are approved by testing agencies that listed and labeled fire-resistant glazing products with which products are used for applications and fire-protection ratings indicated.
- B. Glazing Sealants for Fire-Rated Glazing Products: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 50, Use NT. Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Dow Corning Corporation; 795.
 - b. GE Construction Sealants; Momentive Performance Materials Inc; SilGlaze II SCS2800.
 - c. Tremco Incorporated; Spectrem 2.
 - 2. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
- C. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
 - 1. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.

2.7 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

2.8 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with manufacturing and installation tolerances, including those for size, squareness, and offsets at corners, and for compliance with minimum required face and edge clearances.
- 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 fire side and protected side. Label or mark units as needed so that fire side and protected side are readily identifiable. Do not use materials that leave visible marks in the completed work.

3.3 GLAZING, GENERAL

- A. Use methods approved by testing agencies that listed and labeled fire-resistant glazing products.
- B. 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.
- 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 with proper orientation so that coatings face fire side or protected side as specified.

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 CLEANING AND PROTECTION

- A. Immediately after installation, remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. 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.

1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer.
- C. Remove and replace glass that is damaged during construction period.
- D. 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.

3.6 FIRE-PROTECTION-RATED GLAZING SCHEDULE

- A. Glass Type GLI-2: 45-minute fire-protection-rated glazing with 450 deg F temperature-rise limitation; laminated glass with intumescent interlayers.
- B. Glass Type GLI-3: 90-minute fire-protection-rated glazing with 450 deg F (250 deg C) temperature-rise limitation; laminated glass with intumescent interlayers.

END OF SECTION 088813

SECTION 089119 - FIXED LOUVERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fixed extruded-aluminum louvers.

1.2 DEFINITIONS

- A. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.
- B. Horizontal Louver: Louver with horizontal blades (i.e., the axis of the blades are horizontal).
- C. Vertical Louver: Louver with vertical blades (i.e., the axis of the blades are vertical).
- D. Drainable-Blade Louver: Louver with blades having gutters that collect water and drain it to channels in jambs and mullions, which carry it to bottom of unit and away from opening.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.
- B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.
 - 1. Show weep paths, gaskets, flashings, sealants, and other means of preventing water intrusion.
 - 2. Show mullion profiles and locations.
- C. Samples: For each type of metal finish required.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Based on evaluation of comprehensive tests performed according to AMCA 500-L by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for each type of louver and showing compliance with performance requirements specified.

1.5 FIELD CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain fixed louvers from single source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.

2.2 PERFORMANCE REQUIREMENTS

- A. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.
- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- C. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.

2.3 FIXED EXTRUDED-ALUMINUM LOUVERS

- A. Horizontal Drainable-Blade Louver:
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Ruskin Company; ELF15J Thin Line Stationary Louver or comparable product by one of the following:
 - a. Airolite Company, LLC (The).
 - b. Greenheck Fan Corporation.
 - c. Nystrom, Inc.
 - 2. Louver Depth: 1-1/2 inches.
 - 3. Frame and Blade Nominal Thickness: Not less than 0.062 inch for blades and 0.062 inch for frames.
 - 4. Mullion Type: Exposed.
 - 5. Louver Performance Ratings:
 - a. Free Area: Not less than 24 percent.
 - 6. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

2.4 LOUVER SCREENS

- A. General: Provide screen at each exterior louver.
 - 1. Screen Location for Fixed Louvers: Interior face.
 - 2. Screening Type: Bird screening.

- B. Secure screen frames to louver frames with stainless-steel machine screws, spaced a maximum of 6 inches from each corner and at 12 inches o.c.
- C. Louver Screen Frames: Fabricate with mitered corners to louver sizes indicated.
 - 1. Metal: Same type and form of metal as indicated for louver to which screens are attached. Reinforce extruded-aluminum screen frames at corners with clips.
 - 2. Finish: Same finish as louver frames to which louver screens are attached.
 - 3. Type: Rewirable frames with a driven spline or insert.
- D. Louver Screening for Aluminum Louvers:
 - 1. Bird Screening: Aluminum, 1/2-inch- square mesh, 0.063-inch wire.

2.5 MATERIALS

- A. Aluminum Extrusions: ASTM B 221, Alloy 6063-T5, T-52, or T6.
- B. Fasteners: Use types and sizes to suit unit installation conditions.
 - 1. Use Phillips flat-head screws for exposed fasteners unless otherwise indicated.
 - 2. For fastening aluminum, use aluminum or 300 series stainless-steel fasteners.
 - 3. For color-finished louvers, use fasteners with heads that match color of louvers.
- C. Postinstalled Fasteners for Concrete and Masonry: Torque-controlled expansion anchors, fabricated from stainless-steel components, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing according to ASTM E 488/E 488M conducted by a qualified testing agency.
- D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

2.6 FABRICATION

- A. Factory assemble louvers to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- B. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.
- C. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
 - 1. Frame Type: Channel unless otherwise indicated.
- D. Include supports, anchorages, and accessories required for complete assembly.

- E. Join frame members to each other and to fixed louver blades with fillet welds, threaded fasteners, or both, as standard with louver manufacturer unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

2.7 ALUMINUM FINISHES

- A. Finish louvers after assembly.
- B. High-Performance Organic Finish: Two-coat fluoropolymer finish complying with AAMA 2604 and 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.
 - 1. Color and Gloss: Match adjacent materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and openings, 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. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

3.3 INSTALLATION

- A. Locate and place louvers level, plumb, and at indicated alignment with adjacent work.
- B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
- C. Form closely fitted joints with exposed connections accurately located and secured.
- D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.
- E. Protect unpainted galvanized- and nonferrous-metal surfaces that are in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.

- F. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Section 079200 "Joint Sealants" for sealants applied during louver installation.

3.4 ADJUSTING AND CLEANING

- A. Clean exposed louver surfaces that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate during construction period.
- B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.
- C. Restore louvers damaged during installation and construction, so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.
 - 1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION 089119

SECTION 090561.13 - MOISTURE VAPOR EMISSION CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fluid-applied, resin-based, membrane-forming systems that control the moisture-vapor-emission rate of high-moisture, interior concrete to prepare it for floor covering installation.

1.2 UNIT PRICES

- ##### A.
- Work of this Section is affected by the Moisture Vapor Emission Control Unit Price. When testing conducted in other Sections demonstrates moisture vapor emission values are not within finish flooring manufacturers limits, the Owner will execute a change order adding vapor control system for that portion of the work on a unit cost square footage basis.

1.3 DEFINITIONS

- ##### A.
- MVE: Moisture vapor emission.
- ##### B.
- MVER: Moisture vapor emission rate.

1.4 ACTION SUBMITTALS

- ##### A.
- Product Data: For each type of product.

1.5 INFORMATIONAL SUBMITTALS

- ##### A.
- Qualification Data: For Installer and manufacturer.
- ##### B.
- Product Test Reports: For each MVE-control system, for tests performed by manufacturer and witnessed by a qualified testing agency.
- ##### C.
- Preinstallation testing reports.
- ##### D.
- Field quality-control reports.

1.6 QUALITY ASSURANCE

- ##### A.
- Manufacturer Qualifications: Employs factory-trained personnel who are available for consultation and Project-site inspection.
- ##### B.
- Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

- ##### A.
- Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating directions for storage and mixing with other components.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Comply with MVE-control system manufacturer's written instructions for substrate and ambient temperatures, humidity, ventilation, and other conditions affecting system installation.
 - 1. Store system components in a temperature-controlled environment and protected from weather and at ambient temperature of not less than 65 deg F and not more than 85 deg F at least 48 hours before use.
 - 2. Maintain ambient temperature and relative humidity in installation areas within range recommended in writing by MVE-control system manufacturer, but not less than 65 deg F or more than 85 deg F and not less than 40 or more than 60 percent relative humidity, for 48 hours before installation, during installation, and for 48 hours after installation unless longer period is recommended in writing by manufacturer.
 - 3. Install MVE-control systems where concrete surface temperatures will remain a minimum of 5 deg F higher than the dew point for ambient temperature and relative humidity conditions in installation areas for 48 hours before installation, during installation, and for 48 hours after installation unless longer period is recommended in writing by manufacturer.

1.9 WARRANTY

- A. Manufacturer's Special Warranty: Provide manufacturer's written warranty guaranteeing the integrity of the MVE-Control System to be free of manufacturing defects, remain adhered to substrate, and not be affected by moisture or alkalinity and covering coating failure caused by concrete moisture vapor emission and alkalinity.
 - 1. Warranty covers cost of MVE-Control System, preparation and installation of compounds and all labor charges associated to repair or replace materials in areas exhibiting failure caused by concrete moisture vapor emission and alkalinity damage, including replacing floor covering materials and removing, storing, and reinstalling all equipment and furnishings.
 - 2. Period of Warranty: Not less than 20 years.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. MVE-Control System Capabilities: Capable of suppressing MVE without failure where installed on concrete that exhibits the following conditions:
 - 1. MVER: Maximum 30 lbs. of water/1000 sq. ft. when tested according to ASTM F1869.
 - 2. Relative Humidity: Maximum 100 percent when tested according to ASTM F2170 using in situ probes.
- B. Water-Vapor Transmission: Through MVE-control system, maximum 0.06 perm when tested according to ASTM E96/E96M.
- C. Tensile Bond Strength: For MVE-control system, greater than 200 psi with failure in the concrete according to ASTM D7234.

2.2 MVE-CONTROL SYSTEM

- A. MVE-Control System- Epoxy: ASTM F3010-qualified, fluid-applied, two-component, epoxy-resin, membrane-forming system; formulated for application on concrete substrates to reduce MVER to level required for installation of floor coverings indicated and acceptable to manufacturers of floor covering products indicated, including adhesives.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. ARDEX Americas; MC Plus Moisture Control System.
 - b. Dependable, LLC; Vaporseal-HM.
 - c. KOSTER American Corporation; Koster VAP I2000 FS or Koster VAP I2000 UFS.
 - d. MAPEI Corporation; Planiseal VS Fast.
 - 2. Substrate Primer: Provide MVE-control system manufacturer's concrete-substrate primer if required for system indicated by substrate conditions.
 - 3. Cementitious Underlayment Primer: If required for subsequent installation of cementitious underlayment products, provide MVE-control system manufacturer's primer to ensure adhesion of products to MVE-control system.

2.3 ACCESSORIES

- A. Patching and Leveling Material: Moisture-, mildew-, and alkali-resistant product recommended in writing by MVE-control system manufacturer and with minimum of 3000-psi compressive strength after 28 days when tested according to ASTM C109/C109M.
- B. Crack-Filling Material: Resin-based material recommended in writing by MVE-control system manufacturer for sealing concrete substrate crack repair.
- C. Cementitious Underlayment: If required to maintain manufacturer's warranty, provide MVE-control system manufacturer's hydraulic cement-based underlayment.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for maximum moisture content, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Installation of system indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Preinstallation Testing:
 - 1. Testing Agency: Engage a qualified testing agency to perform tests.
 - 2. Refer to individual flooring sections in Division 09 for testing requirements.
 - 3. Tensile-Bond-Strength Testing: For typical locations indicated to receive installation of MVE-control system, install minimum 100-sq. ft. area of MVE-control system to prepared concrete substrate and test according to ASTM D7234.
 - a. Proceed with installation only where tensile bond strength is greater than 200 psi with failure in the concrete.

- B. Concrete Substrates: Prepare and clean substrates according to MVE-control system manufacturer's written instructions to ensure adhesion of system to concrete.
 - 1. Remove coatings and other substances that are incompatible with MVE-control system and that contain soap, wax, oil, or silicone, using mechanical methods recommended in writing by MVE-control system manufacturer. Do not use solvents.
 - 2. Provide concrete surface profile complying with ICRI 310.2R CSP 3 by shot blasting using apparatus that abrades the concrete surface with shot, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
 - 3. After shot blasting, repair damaged and deteriorated concrete according to MVE-control system manufacturer's written instructions.
 - 4. Protect substrate voids and joints to prevent resins from flowing into or leaking through them.
 - 5. Fill surface depressions and irregularities with patching and leveling material.
 - 6. Fill surface cracks, grooves, control joints, and other nonmoving joints with crack-filling material.
 - 7. Allow concrete to dry, undisturbed, for period recommended in writing by MVE-control system manufacturer after surface preparation, but not less than 24 hours.
 - 8. Before installing MVE-control systems, broom sweep and vacuum prepared concrete.
- C. Protect walls, floor openings, electrical openings, door frames, and other obstructions during installation.

3.3 INSTALLATION

- A. Install MVE-control system according to ASTM F3010 and manufacturer's written instructions to produce a uniform, monolithic surface free of surface deficiencies such as pin holes, fisheyes, and voids.
 - 1. Install primers as required to comply with manufacturer's written instructions.
- B. Do not apply MVE-control system across substrate expansion, isolation, and other moving joints.
- C. Apply system, including component coats if any, in thickness recommended in writing by MVE-control system manufacturer for MVER indicated by preinstallation testing.
- D. Cure MVE-control system components according to manufacturer's written instructions. Prevent contamination or other damage during installation and curing processes.
- E. After curing, examine MVE-control system for surface deficiencies. Repair surface deficiencies according to manufacturer's written instructions.
- F. Install cementitious underlayment over cured membrane if required to maintain manufacturer's warranty and in thickness required to maintain the warranty.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform installation inspections.
- B. Installation Inspections: Inspect substrate preparation and installation of system components to ensure compliance with manufacturer's written instructions and to ensure that a complete MVE-control system is installed without deficiencies.
 - 1. Verify that surface preparation meets requirements.

2. Verify that component coats and complete MVE-control-system film thicknesses comply with manufacturer's written instructions.
 3. Verify that MVE-control-system components and installation areas that evidence deficiencies are repaired according to manufacturer's written instructions.
- C. Alkalinity Testing: Perform pH testing according to ASTM F710. Install MVE-control system in areas where pH readings are less than 7.0 and in areas where pH readings are greater than 8.5.
- D. 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.
1. Anhydrous Calcium Chloride Test: ASTM F1869. Install MVE-control system in locations where concrete substrate MVER exceeds 3 lbs. of water/1000 sq. ft. in 24 hours.
- E. MVE-control system will be considered defective if it does not pass inspections.
- 3.5 PROTECTION
- A. Protect MVE-control system from damage, wear, dirt, dust, and other contaminants before floor covering installation. Use protective methods and materials, including temporary coverings, recommended in writing by MVE-control system manufacturer.
 - B. Do not allow subsequent preinstallation examination and testing for floor covering installation to damage, puncture, or otherwise compromise the MVE-control system membrane.

END OF SECTION 090561.13

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Non-load-bearing steel framing systems for partition walls, framed soffits, furring, etc.
 - 2. Suspension systems for interior ceilings and soffits.
 - 3. Grid suspension systems for gypsum board ceilings.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Delegated-Design Submittal: Submit documentation indicating structural review and analysis, signed and sealed by qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS

- A. Certifications: Provide Manufacturer Certification specified in "Steel Framing for Framed Assemblies" article in Part 2 below.

1.4 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 or the Steel Stud Manufacturers Association.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage qualified professional engineer to design non-structural metal framing as follows:
 - 1. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by qualified professional engineer.
 - 2. Professional Engineer Qualifications: professional engineer legally qualified to practice in jurisdiction where Project is located and experienced in providing engineering services of kind indicated and defined as those performed for installations of non-structural metal framing that are similar to those indicated for this Project in material, design, and extent.
- B. Structural Performance: Provide non-structural metal framing capable of withstanding design loads within limits and under conditions indicated.
 - 1. Design Loads: As indicated on Structural Drawings.

- C. 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 E 119 by an independent testing agency.
- D. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.
- E. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
 - 1. Design Values:
 - a. Deflection Limit: Design framing systems to withstand design loads without deflections greater than the following:
 - 1) $L/240$ unless otherwise noted.
 - 2) $L/360$ where Level 5 gypsum board finish is indicated, at tile backing panels, where plaster veneer is indicated, and elsewhere as indicated.
 - b. Lateral Pressure:
 - 1) 5.0 psf (240 Pa) unless otherwise noted.
 - 2) 7.5 psf (360 Pa) at all shaft enclosures penetrating one or more floors, elevator enclosures, pressurized plenums, entrance lobbies and vestibules with automatic entrances, and elsewhere as noted.
 - 3) 10 psf (480 Pa) at stair enclosures.
 - 2. Steel Sheet Components: Comply with ASTM C 645 requirements for metal, unless otherwise indicated.
 - 3. Protective Coating: ASTM A 653/A 653M, G40, hot-dip galvanized, unless otherwise indicated.
 - a. EQ Coatings: Where an EQ coating is proposed in lieu of specified galvanized coating, submit written documentation from authorities having jurisdiction indicating proposed EQ coating is recognized by the authorities having jurisdiction as providing corrosion resistance equivalent to specified galvanizing.

2.2 SUSPENSION SYSTEM COMPONENTS

- A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch- diameter wire, or double strand of 0.0475-inch- diameter wire.
- B. Hanger Attachments to Concrete:
 - 1. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC58 or AC308 as appropriate for the substrate.
 - a. Type: torque-controlled, adhesive anchor or adhesive anchor.

- b. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5, unless otherwise indicated.
 - 2. Power-Actuated Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- C. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.162-inch diameter.
- D. Carrying Channels (Main Runners): Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.0538 inch and minimum 1/2-inch- wide flanges.
 - 1. Depth: As indicated on Drawings.
- E. Furring Channels (Furring Members):
 - 1. Cold-Rolled Channels: 0.0538-inch bare-steel thickness, with minimum 1/2-inch- wide flanges, 3/4 inch deep.
 - 2. Steel Studs: ASTM C 645.
 - a. Minimum Base-Metal Thickness: 0.0329 inch.
 - b. Depth: As indicated on Drawings.
 - 3. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch deep.
 - a. Minimum Base Metal Thickness: 0.0329 inch.
 - 4. Resilient Furring Channels: 1/2-inch- deep members designed to reduce sound transmission.
 - a. Configuration: Asymmetrical or hat shaped.
- F. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - 2. Products: Subject to compliance with requirements, provide one of the following:
 - a. Armstrong World Industries, Inc.; Drywall Grid Systems.
 - b. Chicago Metallic Corporation; 640/660 Drywall Ceiling Suspension 650/670 Fire Rated Drywall Ceiling Suspension.
 - c. USG Corporation; Drywall Suspension System.

2.3 FRAMING SYSTEMS

- A. Studs and Tracks: ASTM C 645.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by manufacturer providing framing systems or products by one of the following manufacturers:
 - a. ClarkDietrich Building Systems.

- b. Marino\WARE.
 - c. MBA Building Supplies.
 - d. Phillips Manufacturing Co.
- 2. Steel Studs and Tracks
 - a. Minimum Base-Metal Thickness: 0.0296 inches or as required to meet ASTM standards and STC ratings listed for the partition type.
 - b. Depth: As indicated on Drawings.
- B. Slip-Type Head Joints: Where indicated, provide the following:
 - 1. Deflection Track: Steel sheet top track manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
 - a. Products: Subject to compliance with requirements, provide products by the manufacturer providing framing systems or one of the following:
 - 1) ClarkDietrich Building Systems; SLP-TRK Slotted Deflection Track.
 - 2) MarinoWARE; Slotted Track.
 - 3) MBA Building Supplies; Slotted Deflecto Track.
- C. Flat Strap: Steel sheet for insulation retention behind furred walls.
 - 1. Minimum Base-Metal Thickness: 0.0179 inch.
- D. Metal Back-Up Plates: Minimum thickness of 0.0538 inch galvanized steel plates of sizes and configurations detailed, or if not detailed, as required to accommodate the wall hung casework, millwork, railings or other items mounted to metal stud and wallboard walls and partitions.
 - 1. Provide plates designed, and certified, to support a single concentrated load of 200 lbf for handrails. Plates must also be able to resist a linear load of 50 lbf per linear foot applied in any direction along handrail but not concurrent with concentrated load of 200 lbf.
 - 2. Provide plates designed and certified to support a concentrated load of 250 lbf for grab bars and other accessibility items.
 - 3. Provide plates designed, and certified, to support a linear load of 144 lbs. per linear foot for all other items.
 - 4. All loads required above are in addition to the weight of the item supported by the back-up plate.
 - 5. Provide plates designed for screw-attachment to steel studs with back-up plate faces flush with face of studs or overlapping face of studs with pre-cut notches matching stud spacing.

- 6. Products: Subject to compliance with requirements, provide the following products or an acceptable equivalent product:
 - a. Bailey Metal Products Limited; Baily Backer Bar.
- E. Cold-Rolled Channel Bridging: 0.0538-inch bare-steel thickness, with minimum 1/2-inch- wide flanges.
 - 1. Depth: 1-1/2 inches, unless otherwise indicated.
 - 2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches, 0.068-inch- thick, galvanized steel.
- F. Resilient Furring Channels: 1/2-inch- deep, steel sheet members designed to reduce sound transmission.
 - 1. Configuration: Asymmetrical or hat shaped.

2.4 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 - 1. Fasteners for Metal 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 the following:
 - 1. 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.
 - 1. 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 runners (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 required for fire-resistance ratings indicated. Protect adjacent fire-resistive materials from damage.

3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754, except comply with framing sizes and spacing indicated.
1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 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.
1. Comply with details indicated. Install metal back-up plates in accordance with plate manufacturer's written instructions using self-tapping pan-head screws of type and in quantity required by manufacturer to achieve full load capacity.
- 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 CEILING SUSPENSION SYSTEMS

- A. Install suspension system components in sizes and spacings indicated on Drawings, but not greater than those required by referenced installation standards for assembly types and other assembly components indicated.
1. Hangers: 48 inches o.c.
 2. Carrying Channels (Main Runners): 48 inches o.c.
 3. Furring Channels (Furring Members): 16 inches o.c.
- 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. Do not attach hangers to steel roof deck.
 - 5. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
 - 6. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
 - 7. 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.

3.5 INSTALLING FRAMED ASSEMBLIES

- A. Install framing system components according to spacing indicated, but not greater than spacing required by referenced installation standards for assembly types.
 - 1. Single-Layer Application: 16 inches o.c. unless otherwise indicated.
 - 2. Multilayer Application: 16 inches o.c. unless otherwise indicated.
 - 3. Tile Backing Panels: 16 inches o.c. 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 penetrating 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 runner track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb and tie together, similar to ClarkDietrich's "Tied Jamb Studs" detail, 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.
 - 5. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
 - 6. Curved Partitions:
 - a. Bend track to uniform curve and locate straight lengths so they are tangent to arcs.
 - b. Begin and end each arc with a stud, and space intermediate studs equally along arcs. On straight lengths of not less than 2 studs at ends of arcs, place studs 6 inches o.c.
- E. Direct Furring:
 - 1. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches o.c.
- F. 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.

END OF SECTION 092216

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Interior gypsum board.
 - 2. Tile backing panels.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.3 STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack panels flat to prevent sagging.

1.4 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install interior products until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, those that are moisture damaged, and those that are 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.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
 - 1. Marking Fire-Resistance-Rated Assemblies: Apply hourly rating text in 4-inch high red numbers and black Arial font letters at maximum 10 feet between rating text applications as measured from beginning of one text application to end of next text application extending from one end of fire-resistance-rated wall to opposite end of fire-resistance-rated wall,

located 6 inches above finished ceiling to bottom of text. Provide following hourly rating text as applicable to wall:

- a. 1 HR
- b. 2 HR
- c. 3 HR
- d. 4 HR
- e. 1 HR Fire/Smoke
- f. 2 HR Fire/Smoke

- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 PANELS, GENERAL

- A. Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

- A. Gypsum Board, Type X: ASTM C 1396/C 1396M.

- 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. CertainTeed Corporation.
 - b. Georgia-Pacific Building Products
 - c. National Gypsum Company.
 - d. United States Gypsum Company.
- 2. Thickness: 5/8 inch.
- 3. Long Edges: Tapered.

- B. Abuse-Resistant Gypsum Board: ASTM C 1629/C 1629M. Manufactured to produce greater resistance to surface indentation, through-penetration (impact resistance), and abrasion than standard, regular-type and Type X gypsum board.

- 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. CertainTeed Corporation; ProRoc Abuse Resistant.
 - b. Georgia-Pacific Gypsum; ToughRock Abuse-Guard Gypsum Board
 - c. National Gypsum Company; Hi-Abuse Brand XP Fire-Shield Wallboard.
 - d. United States Gypsum Company; USG Sheetrock Brand Mold Tough Abuse-Resistant VHI Firecode.

2. Core: 5/8 inch, Type X.
 3. Surface Abrasion: Meets or exceeds Level 3 requirements.
 4. Surface Indentation: Meets or exceeds Level 1 requirements.
 5. Single-Drop Soft-Body Impact: Meets or exceeds Level 2 requirements.
 6. Long Edges: Tapered.
 7. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
- C. Impact-Resistant Gypsum Board: ASTM C 1629/C 1629M.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Georgia-Pacific Gypsum; DensArmor Plus Impact-Resistant Panel.
 - b. National Gypsum Company; Hi-Impact Brand XP Fire-Shield Wallboard.
 - c. United States Gypsum Company; USG Sheetrock Brand Mold Tough VHI (Very High Impact) Firecode Core.
 2. Core: 5/8 inch, Type X.
 3. Surface Abrasion: Meets or exceeds Level 3 requirements.
 4. Surface Indentation: Meets or exceeds Level 1 requirements.
 5. Single-Drop Soft-Body Impact: Meets or exceeds Level 3 requirements.
 6. Hard-Body Impact: Meets or exceeds Level 3 requirements according to test in Annex A1.
 7. Long Edges: Tapered.
 8. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.4 SPECIALTY GYPSUM BOARD

- A. Glass-Mat Interior Gypsum Board: ASTM C 1658/C 1658M. With fiberglass mat laminated to both sides. Specifically designed for interior use.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Georgia-Pacific Building Products; DensArmour Plus.
 - b. National Gypsum Company; eXP Interior Extreme.
 - c. Temple-Inland Building Products by Georgia-Pacific; Green Glass Interior Gypsum Board.
 - d. United States Gypsum Company; USG Sheetrock Brand Glass-Mat Panels Mold Tough.
 2. Core: 5/8 inch, Type X.
 3. Long Edges: Tapered.
 4. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.5 TILE BACKING PANELS

- A. Glass-Mat, Water-Resistant Backing Board: Complying with ASTM C 1178/C 1178M, with manufacturer's standard edges.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. CertainTeed Corporation; GlasRoc Tile Backer.
 - b. Georgia-Pacific Building Products; DensShield Tile Backer.
 - c. National Gypsum Company; eXP Tile Backer.
 - 2. Core: 5/8 inch, Type X.
 - 3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.6 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
 - 1. Material: Plastic/Vinyl; Basis-of-Design manufacturer; Trim-Tex Drywall Products.
 - 2. Shapes:
 - a. Cornerbead.
 - b. Bullnose bead.
 - c. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - d. L-Bead: L-shaped; exposed long flange receives joint compound.
 - e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
 - f. Expansion (control) joint.

2.7 JOINT TREATMENT AND FINISH MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
 - 1. Interior Gypsum Wallboard: Paper.
 - 2. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
 - 3. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
 - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.

- a. Use setting-type compound for installing paper-faced metal trim accessories.
 3. Fill Coat: For second coat, use drying-type, all-purpose compound.
 4. Finish Coat: For third coat, use drying-type, all-purpose compound.
 5. Skim Coat: For final coat of Level 5 finish, use high-build interior coating product designed for application by airless sprayer and to be used instead of skim coat to produce Level 5 finish.
- D. Joint Compound for Tile Backing Panels:
1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.

2.8 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- C. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
- D. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Hilti, Inc.; CP 506 Smoke and Acoustical Sealant.
 - b. Pecora Corporation; AC-20 FTR.
 - c. United States Gypsum Company; SHEETROCK Acoustical Sealant.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames and framing, for compliance with requirements and other conditions affecting performance.

- 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 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling/soffit 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. Attach gypsum panels to framing provided at openings and cutouts.
- H. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. 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.
- I. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- J. 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 C 919 and with

manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

1. Install sound attenuation blankets before installing gypsum panels, unless blankets are readily installed after panels have been installed on one side.
- K. Fire-Resistance-Rated Assemblies: Provide marking of fire-resistance-rated assemblies as specified in Performance Requirements article in Part 2 of this Section.
- L. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's written recommendations.
 1. Space fasteners in panels that are tile substrates a maximum of 8 inches o.c., unless otherwise recommended by manufacturer or referenced standards.

3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:
 1. Type X: Vertical surfaces, unless otherwise indicated.
 2. Abuse-Resistant Type: As indicated on Drawings.
 3. Impact-Resistant Type: As indicated on Drawings.
 4. Mold-Resistant Type: As indicated on Drawings.
 5. Glass-Mat Interior Type: As indicated on Drawings.
- B. 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-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.
- C. 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 1 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-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.
 5. Offset seams a minimum of 4 inches, but directly over framing. In no instances shall seams of gypsum board be installed directly above another.
- D. STC Rated Partitions:
1. Maintain a 1/4 inch gap between the gypsum board / floor and gypsum board / ceiling. This gap to be filled with acoustical sealant.
 2. Joints or seams greater than 1/8 inch in walls shall be caulked with acoustical sealant.
 3. In multilayer applications, each layer shall be sealed according to above prior to installation of next layer.

3.4 APPLYING TILE BACKING PANELS

- A. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.
- B. Areas Not Subject to Wetting: Install regular-type gypsum wallboard panels to produce a flat surface except at showers, tubs, and other locations indicated to receive water-resistant panels.

3.5 INSTALLING 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. Control Joints: Install control joints according to ASTM C 840 at locations indicated on Drawings and as follows:
 1. Install where a partition, wall, or ceiling traverses a construction joint (expansion, seismic or building control element) in the base building structure.
 2. Install where movement may occur at joints in a wall or partition supported by building systems that move differentially.
 3. Install where a wall or partition runs in an uninterrupted straight plane exceeding 30 linear ft.
 4. Install in interior ceilings with perimeter relief so that linear dimensions between control joints do not exceed 50 ft and total area between control joints does not exceed 2500 sq ft.

5. Install in interior ceilings without perimeter relief so that linear dimensions between control joints do not exceed 30 ft and total area between control joints does not exceed 900 sq ft.
 6. Install in exterior ceilings and soffits so that linear dimensions between control joints do not exceed 30 ft and total area between control joints does not exceed 900 sq ft.
 7. Install where ceiling framing members change direction.
 8. Install at one side of door frames. Full height door frames shall be considered equivalent to a control joint.
 9. Install all control joints at specific locations approved by the Architect for visual effect.
- C. Interior Trim: Install in the following locations:
1. Cornerbead: Use at outside corners, unless otherwise indicated.
 2. Bullnose Bead: Use at outside corners where indicated.
 3. L-Bead: Use where indicated.
 4. U-Bead: Use at exposed panel edges where indicated.

3.6 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 those with trim having flanges not intended for tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 2. Level 2: Panels that are substrate for tile.
 3. Level 4: At panel surfaces that will be exposed to view, unless otherwise indicated.
 - a. Primer and its application to surfaces are specified in other Division 9 Sections.
 4. Level 5: Where indicated on Drawings and where exterior glass mat sheathing is exposed on the interior of the building.
 - a. Primer and its application to surfaces are specified in other Division 9 Sections.
- E. Glass-Mat, Water-Resistant Backing Panels: Finish according to manufacturer's written instructions.
1. Apply Level 5 finish (ASTM C 840) to backing panel surfaces receiving painted finish.

3.7 FIELD QUALITY CONTROL

- A. Above-Ceiling Observation: Before Contractor installs gypsum board ceilings, Architect will conduct an above-ceiling observation and report deficiencies in the Work observed. Do not proceed with installation of gypsum board to ceiling support framing until deficiencies have been corrected.
 - 1. Notify Architect seven days in advance of date and time when Project, or part of Project, will be ready for above-ceiling observation.
 - 2. Before notifying Architect, complete the following in areas to receive gypsum board ceilings:
 - a. Installation of 80 percent of lighting fixtures, powered for operation.
 - b. Installation, insulation, and leak and pressure testing of water piping systems.
 - c. Installation of air-duct systems.
 - d. Installation of air devices.
 - e. Installation of mechanical system control-air tubing.
 - f. Installation of ceiling support framing.

3.8 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 092900

SECTION 093000 - TILING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Ceramic tiling, including, but not limited to, the following:
 - a. Porcelain tile.
 - b. Glazed wall tile.
 - c. Waterproof membrane for thinset applications.
 - d. Crack isolation membrane.
 - e. Metal edge strips.

1.2 DEFINITIONS

- A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.
- B. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.8, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.12, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A108.17, which are contained in its "Specifications for Installation of Ceramic Tile."
- C. Module Size: Actual tile size plus joint width indicated.
- D. Face Size: Actual tile size, excluding spacer lugs.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

1.4 SEQUENCING AND SCHEDULING

- A. Sequence tile installation with other work to minimize possibility of damage and soiling during remainder of construction period.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.

B. Shop Drawings:

1. Ceramic Tile and Glass Tile: 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 Verification:

1. Full-Size Units: Of each type and composition of tile and for each color and finish required.
 - a. For ceramic mosaic tile in color blend patterns, provide full sheets of each color blend.
2. Full-size units of each type of trim and accessory for each color and finish required.
3. Metal edge strips in 6-inch lengths.

1.6 INFORMATIONAL SUBMITTALS

- A. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.
- B. Product Certificates: For each type of product.
- C. Product Test Reports: For tile-setting and -grouting products and certified porcelain tile.

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. Ceramic Tile, Glass 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 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 Ceramic Tile Education Foundation Certified Installers or installers recognized by the U.S. Department of Labor as Journeyman Tile Layers.

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.

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.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Ceramic Tile and Glass 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 crack isolation 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. Waterproof membrane.
 - 2. Crack isolation membrane.
 - 3. Metal edge strips.

2.2 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics 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.

2.3 CERAMIC TILE PRODUCTS

- A. Porcelain Tile Type: Unglazed porcelain tile.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. American Olean; a division of Dal-Tile Corporation.
 - b. Crossville, Inc.
 - c. Daltile.
 - d. Florida Tile, Inc.
 - 2. Certification: Tile certified by the Porcelain Tile Certification Agency.
 - 3. Face Size: As indicated in Finish Schedule.
 - 4. Thickness: As indicated in Finish Schedule.
 - 5. Face: Pattern of design indicated in Finish Schedule.
 - 6. Dynamic Coefficient of Friction (DCOF AcuTest, ANSI A137.1): Not less than the following:
 - a. Level Surfaces: 0.5.
 - b. Ramps: 0.8.
 - 7. Tile Color, Glaze, and Pattern: As indicated by manufacturer's designations in Finish Schedule.
 - 8. Grout Color: As selected by Architect from manufacturer's full range.
- B. Glazed Wall Tile Type: Glazed wall tile:
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. American Marazzi Tile, Inc

- b. American Olean; a division of Dal-Tile Corporation.
 - c. Daltile.
 - 2. Module Size: As indicated in Finish Schedule
 - 3. Thickness: As indicated in Finish Schedule.
 - 4. Face: Pattern of design indicated in Finish Schedule.
 - 5. Tile Color and Pattern: As indicated by manufacturer's designations in Finish Schedule.
 - 6. Grout Color: As selected by Architect from manufacturer's full range.
- C. Waterproof Membrane
 - 1. General: Manufacturer's standard product that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
 - 2. Chlorinated Polyethylene Sheet: Nonplasticized, chlorinated polyethylene faced on both sides with nonwoven polyester fabric.
 - a. Products: Subject to compliance with requirements, provide the following or Architect approved equivalent:
 - 1) Noble Company (The); Nobleseal TS.
 - b. Nominal Thickness: 0.040 inch.
- D. Setting Materials
 - 1. Latex-Portland Cement Mortar (Thinset): ANSI A118.4.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Ardex Americas.
 - 2) Custom Building Products.
 - 3) LATICRETE SUPERCAP, LLC.
 - 4) MAPEI Corporation.
 - b. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
 - c. Provide prepackaged, dry-mortar mix combined with acrylic resin liquid-latex additive at Project site.
 - d. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.4.
- E. Grout Materials
 - 1. Sand-Portland Cement Grout: ANSI A108.10, consisting of white or gray cement and white or colored aggregate as required to produce color indicated.

2. Water-Cleanable Epoxy Grout: ANSI A118.3, with a VOC content of 65 g/L or less.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Bonsal American; an Oldcastle company.
 - 2) Custom Building Products.
 - 3) LATICRETE SUPERCAP, LLC.
 - 4) MAPEI Corporation.
 - b. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to 140 and 212 deg F (60 and 100 deg C), respectively, and certified by manufacturer for intended use.

F. Miscellaneous Materials

1. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
2. Metal Edge and Cove Strips: Angle or L-shaped and coved, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications; stainless-steel, ASTM A 666, 300 Series exposed-edge material.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1) Blanke Corporation.
 - 2) Ceramic Tool Company, Inc.
 - 3) Schluter Systems L.P.
3. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

2.4 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.

PART 3 - EXECUTION

3.1 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 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.
 - 3. 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.
 - 4. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. 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.
- B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot toward drains, unless otherwise indicated on Drawings.
- C. 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.

3.3 CERAMIC TILE INSTALLATION

- 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. Where accent tile differs in thickness from field tile, vary setting-bed thickness so that tiles are flush.
- F. 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.
- G. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
 1. Glazed Wall Tile: 1/8 inch.
 2. Porcelain Tile: 1/4 inch.
- H. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.
- I. 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.
- J. Metal Edge Strips: Install at locations indicated.

3.4 WATERPROOFING INSTALLATION

- A. Install waterproofing 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 waterproofing to cure and verify by testing that it is watertight before installing tile or setting materials over it.

3.5 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.

3.6 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.

3.7 INTERIOR CERAMIC TILE INSTALLATION SCHEDULE

- A. Interior Floors, Concrete Subfloor:
 - 1. Thinset Installations:
 - a. Ceramic Tile Installation: TCNA F122; thinset mortar on waterproof membrane.
 - 1) Thinset Mortar: Latex- portland cement mortar.
 - 2) Grout: High-performance sanded grout.
- B. Interior Walls, Metal Studs or Furring:
 - 1. Thinset Installations:
 - a. Ceramic Tile Installation: TCNA W245 or TCNA W248; thinset mortar on glass-mat, water-resistant gypsum backer board.

St. Louis Veteran's Home Renovation
St. Louis, MO
State Project No. U2307-01
CannonDesign Project No. 005680.00

June 26, 2025
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- 1) Thinset Mortar: Latex- portland cement mortar.
- 2) Grout: Water-cleanable epoxy grout.

END OF SECTION 093000

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes acoustical panels and exposed suspension systems for ceilings.
- B. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete at ceilings.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
 - 1. Acoustical Panel: Set of 6-inch- square Samples of each type, color, pattern, and texture.
 - 2. Exposed Suspension System Members, Moldings, and Trim: Set of 12-inch- long Samples of each type, finish, and color.
- C. 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.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Field quality-control test reports.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each acoustical panel ceiling.
- D. Evaluation Reports: For each acoustical panel ceiling and components and anchor and fastener type.
- E. Sample Warranty: For manufacturer's warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For finishes to include in maintenance manuals.

1.5 MAINTENANCE MATERIALS SUBMITTALS

- A. Furnish extra materials described below, 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 Panels: Full-size panels equal to 2.0 percent of quantity installed.
 - 2. Suspension System Components: Quantity of each exposed component equal to 2.0 percent of quantity installed.
 - 3. Hold-Down Clips: Equal to 2.0 percent of quantity installed.
 - 4. Impact Clips: Equal to 2 percent of quantity installed.

1.6 QUALITY ASSURANCE

- A. Acoustical Testing Agency Qualifications: An independent testing laboratory, or an NVLAP-accredited laboratory, with the experience and capability to conduct the testing indicated. NVLAP-accredited laboratories must document accreditation, based on a "Certificate of Accreditation" and a "Scope of Accreditation" listing the test methods specified.
- B. 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 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.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels, suspension system components, and accessories to Project site in original, unopened packages 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 panels, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, 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 panel ceiling installation.

1.9 COORDINATION

- A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.10 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace specified material that fail within manufacturer's standard warranty period for materials indicated.
 - 1. Failures include, but are not limited to, the following:
 - a. Manufacturing defects.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer to design seismic restraints for ceiling systems as follows:
 - 1. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by qualified professional engineer.
 - 2. Professional Engineer Qualifications: professional engineer legally qualified to practice in jurisdiction where Project is located and experienced in providing engineering services of kind indicated.
- B. Fire-Test-Response Characteristics: Provide acoustical panel ceilings that comply with the following requirements:
 - 1. Fire-Resistance Characteristics: Where indicated, provide acoustical panel ceilings identical to those of assemblies tested for fire resistance per ASTM E 119 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - a. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another testing and inspecting agency.

- b. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 2. Surface-Burning Characteristics: Provide acoustical panels with the following surface-burning characteristics complying with ASTM E 1264 for Class A materials as determined by testing identical products per ASTM E 84:
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less.
- C. Seismic Standard: Provide acoustical panel ceilings designed and installed to withstand the effects of earthquake motions according to the following:
 - 1. Standard for Ceiling Suspension Systems Requiring Seismic Restraint: Comply with ASTM E 580.
 - 2. CISCA's Recommendations for Acoustical Ceilings: Comply with CISCA's "Recommendations for Direct-Hung Acoustical Tile and Lay-in Panel Ceilings--Seismic Zones 0-2."
 - 3. CISCA's Guidelines for Systems Requiring Seismic Restraint: Comply with CISCA's "Guidelines for Seismic Restraint of Direct-Hung Suspended Ceiling Assemblies--Seismic Zones 3 & 4."
 - 4. ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 9, "Earthquake Loads."

2.2 ACOUSTICAL PANELS, GENERAL

- A. Source Limitations:
 - 1. Acoustical Ceiling Panel: Obtain each type through one source from a single manufacturer.
 - 2. Suspension System: Obtain each type through one source from a single manufacturer.
- B. Glass-Fiber-Based Panels: Made with binder containing no urea formaldehyde.
- C. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectance, unless otherwise indicated.
 - 1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches away from test surface per ASTM E 795.
- D. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.
 - 1. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations,

provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

2.3 ACOUSTICAL PANELS FOR ACOUSTICAL PANEL CEILING

- A. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. Ecophon CertainTeed, Inc.
 - 3. United States Gypsum Company.
- B. Classification: Provide panels complying with ASTM E 1264 for type, form, and pattern as follows:
 - 1. Type and Form: Type III, mineral base with painted finish; Form 4, cast or molded.
 - 2. Pattern: As indicated by manufacturer's designation.
- C. Color: White.
- D. Light Reflectance (LR): Not less than 0.85.
- E. Noise Reduction Coefficient (NRC): Not less than 0.70.
- F. Ceiling Attenuation Class (CAC): Not less than 35.
- G. Edge/Joint Detail: Tegular.
- H. Modular Size: As indicated on Drawings.
- I. Broad Spectrum Antimicrobial Fungicide and Bactericide Treatment: Provide acoustical panels treated with manufacturer's standard antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D 3273 and evaluated according to ASTM D 3274 or ASTM G 21.

2.4 METAL SUSPENSION SYSTEMS, GENERAL

- A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.
- B. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.

- C. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
- D. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
 - 1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
 - 2. Size: Select wire diameter so its stress at 3 times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire but provide not less than 0.135-inch-diameter wire.
- E. Seismic Stabilizer Bars: Manufacturer's standard perimeter stabilizers designed to accommodate seismic forces.
- F. Seismic Struts: Manufacturer's standard compression struts designed to accommodate seismic forces.
- G. Seismic Clips: Manufacturer's standard seismic clips designed and spaced to secure acoustical panels in-place during a seismic event.
- H. Hold-Down Clips: Where indicated, provide manufacturer's standard hold-down clips.
- I. Impact Clips: Where indicated, provide manufacturer's standard impact-clip system designed to absorb impact forces against acoustical panels.

2.5 METAL SUSPENSION SYSTEM FOR ACOUSTICAL PANEL CEILINGS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide the product indicated on Drawings or a comparable product by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. Chicago Metallic Corporation.
 - 3. United States Gypsum Company.
- B. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 coating designation, with prefinished 15/16-inch- wide metal caps on flanges.
 - 1. Acoustical Panel Ceiling Type: As indicated in Finish Legend on Drawings
 - 2. Structural Classification: Heavy-duty system.
 - 3. End Condition of Cross Runners: Override (stepped) or butt-edge type.
 - 4. Face Design: Flat, flush.
 - 5. Cap Material: Aluminum cold-rolled sheet.

6. Cap Finish: Painted white.

2.6 ACOUSTICAL SEALANT

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 1. Acoustical Sealant for Exposed and Concealed Joints:
 - a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
 - b. United States Gypsum Company; SHEETROCK Acoustical Sealant.
- B. Acoustical Sealant: Manufacturer's standard sealant complying with ASTM C 834 and effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
 1. Exposed and Concealed Joints: Nonsag, paintable, nonstaining latex sealant.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings:
 1. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.
 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders and comply with layout shown on reflected ceiling plans.
- B. Layout openings for penetrations centered on the penetrating items.

3.3 INSTALLATION

- A. Non-Fire-Resistance-Rated Indirect Hung Suspension System:
 1. Structural Classification: Heavy-Duty System.

- B. General: Install acoustical panel ceilings to comply with ASTM C 636 and seismic design requirements indicated, per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."
- C. Suspend ceiling hangers from building's structural members and as follows:
 - 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 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 either to structures 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. When framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
 - 6. 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.
 - 7. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
- D. 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 post-installed anchors.
- 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 panels with undamaged edges and fit accurately into suspension system runners. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
 - 1. Arrange directionally patterned acoustical panels as follows:
 - a. As indicated on reflected ceiling plans.
 - 2. For reveal-edged panels on suspension system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.

3. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
4. Install hold-down and impact clips in areas indicated, in areas required by authorities having jurisdiction, and for fire-resistance ratings; space as recommended by panel manufacturer's written instructions, unless otherwise indicated.
 - a. Hold-Down Clips: Space 24 inches o.c. on all cross runners.

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 and prepare reports:
 1. Compliance of seismic design.
 2. Periodic inspection during the installation of suspended ceiling grids according to ASCE/SEI 7.
- B. Acoustical panel ceiling hangers, anchors, and fasteners will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.
- D. Remove and replace acoustical panel ceiling hangers and anchors and fasteners that do not pass tests and inspections and retest as specified above.

3.6 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095113

SECTION 096513 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Thermoplastic-rubber base.
 - 2. Rubber molding accessories.

1.2 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 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.
- D. Product Schedule: For resilient base and accessory products. Use same designations indicated on Drawings.

1.3 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.

1.4 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.

1.5 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 THERMOPLASTIC-RUBBER BASE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. Johnsonite; A Tarkett Company.
 - 3. Roppe Corporation, USA.
- B. Product Standard: ASTM F 1861, Type TP (rubber, thermoplastic).
 - 1. Group: I (solid, homogeneous).
 - 2. Style and Location:
 - a. Style A, Straight: Provide in areas with carpet.
 - b. Style B, Cove: Provide in areas with resilient floor coverings.
 - c. Style D, Sculptured: Provide in areas indicated.
 - 1) Profile: As indicated.
- C. Thickness: 0.125 inch.
- D. Height: As indicated on Drawings.
- E. Lengths: Coils in manufacturer's standard length.
- F. Outside Corners: Job formed.
- G. Inside Corners: Job formed.
- H. Colors: As indicated by manufacturer's designations.

2.2 RUBBER MOLDING ACCESSORY

- A. Description: Rubber carpet edge for glue-down applications, nosing for carpet, nosing for resilient floor covering, reducer strip for resilient floor covering, joiner for tile and carpet, and transition strips.
- B. Locations: Provide rubber molding accessories in areas indicated.

- C. Colors and Patterns: As indicated by manufacturer's designations.

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.

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.
- E. Do not stretch resilient base during installation.
- F. 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.

3.4 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.

3.5 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 096513

SECTION 096519 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. *Section Includes:*
 - 1. Solid vinyl floor tile (LVT).

1.2 ACTION SUBMITTALS

- A. *Product Data: For each type of product.*
- B. *Shop Drawings: For each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.*
 - 1. Show details of special patterns and direction of tile.
- C. *Samples for Verification: Full-size units of each color and pattern of floor tile required.*
- D. *Product Schedule: For floor tile. Use same designations indicated on Drawings.*

1.3 INFORMATIONAL SUBMITTALS

- A. *Qualification Data: For Installer.*
- B. *Sample Warranty: For manufacturer's warranty.*

1.4 CLOSEOUT SUBMITTALS

- A. *Maintenance Data: For each type of floor tile to include in maintenance manuals.*

1.5 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. Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.6 QUALITY ASSURANCE

- A. *Installer Qualifications: A qualified installer who employs workers for this Project 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.

1.7 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 (10 deg C) or more than 90 deg F (32 deg C). Store floor tiles on flat surfaces.*

1.8 FIELD CONDITIONS

- A. *Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive floor tile during the following time periods:*
1. *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 (13 deg C) or more than 95 deg F (35 deg C).*
- 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.*

1.9 WARRANTY

- A. *Manufacturer's Warranty: Manufacturer agrees to repair or replace specified material that fail within manufacturer's standard warranty period for materials indicated, including adhesives for high moisture content in the concrete slab.*
1. *Failures include, but are not limited to, the following:*
 - a. *Manufacturing defects.*

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. *Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.*
1. *Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.*

2.2 SOLID VINYL FLOOR TILE (LVT)

- A. *Manufacturers: Subject to compliance with requirements, provide products indicated on the finish legend or one of the following:*
1. *Johnsonite.*

2. Mannington
 3. Tandus Centiva.
- B. Tile Standard: ASTM F 1700.*
1. Class: As indicated by product designations.
 2. Type: A, smooth surface or B, embossed surface as indicated.
- C. Size: As indicated on the drawings.*
- D. Colors and Patterns: As indicated by manufacturer's designations.*

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 floor tile manufacturer for applications indicated.*
- B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.*

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 F 710.*
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, but not less than 5 or more than 9 pH.

4. Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:
 - a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
 - b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level.
5. Moisture Testing Failure: Allow sufficient time to retest until substrates pass specified moisture testing requirements or install MVE system as specified in Section 090561.13 Moisture Vapor Emission Control."
6. Proceed with installation only after concrete substrates pass moisture testing or after installation of moisture-vapor-emission-control membrane.
- C. *Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.*
- D. *Floor Marking: Use chalk or chalk lines covered with clear acrylic spray; do not use floor marking paints, markers, or other marking methods that are incompatible with flooring material and allow markings to show through installed flooring material.*
 1. If substrate has floor marking paints, markers of other marking methods incompatible with flooring and that may allow markings to show through installed flooring material, remove markings using mechanical methods recommended by flooring manufacturer.
 2. Do not install flooring until incompatible floor markings on substrate have been removed and substrate is acceptable to flooring manufacturer for installation of flooring materials.
- E. *Do not install floor tiles until they are the same temperature as the 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 in pattern indicated.

- C. *Match floor 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 with grain running in one direction.
- 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.*
- 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 finished floor 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 flooring 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.*

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 exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
- C. *Protect floor tile from marks, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.*
- D. *Cover floor tile until Substantial Completion.*

END OF SECTION 096519

SECTION 096723 - RESINOUS FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes resinous flooring systems:
 - 1. Decorative quartz.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include manufacturer's technical data, application instructions, and recommendations for each resinous flooring component required.
- B. Samples for Verification: For each resinous flooring system required, 6 inches square, applied to a rigid backing by Installer for this Project.

1.4 INFORMATIONAL SUBMITTALS

- A. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.
- B. Material Certificates: For each resinous flooring component, from manufacturer.
- C. Material Test Reports: For each resinous flooring system, by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For resinous flooring to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring application.
- B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring application.
- C. Close spaces to traffic during resinous flooring application and for 24 hours after application unless manufacturer recommends a longer period.

1.9 SPECIAL WARRANTY

- A. Provide manufacturer's special warranty against failures or defects in resin flooring system.
 - 1. Warranty Period: 3 years from date of Substantial Completion.
 - 2. Warranty shall include coverage against, but not limited to, the following defects:
 - a. Delamination of flooring or base from substrate.
 - b. Cracking, chipping or spalling resulting from impact in excess of specified criteria.
 - c. Surface degradation from effect of specified and manufacturers published list of chemicals in excess of specified and manufacturers published limits.
 - d. Indentation or other damage from rubber wheeled cart traffic with a maximum load of that indicated on Manufacturer's published limits.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Flammability: Self-extinguishing according to ASTM D 635.

2.2 MANUFACTURERS

- A. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, from single source from single manufacturer. Obtain secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from manufacturer recommended in writing by manufacturer of primary materials.

2.3 RESINOUS FLOORING

- A. Resinous Flooring System: Abrasion-, impact-, and chemical-resistant, aggregate-filled, and resin-based monolithic floor surfacing designed to produce a seamless floor and integral cove base.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Stratashield by Tnemec Company, or equivalent comparable product by one of the following:
 - a. Rust-Oleum
 - b. Stonhard, Inc.
 - c. Desco
- B. System Characteristics:
 1. Color and Pattern: As indicated by product designation listed on Drawings.
 2. Wearing Surface: Manufacturer's standard orange-peel texture, with slip resistant properties.
 3. Integral Cove Base: 4 inches high, unless otherwise indicated.
 4. Overall System Thickness: Not less than 3/16 inch.
- C. Resinous Flooring System Components:
 1. Primer: Type recommended by resinous flooring manufacturer for substrate and resinous flooring system indicated.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Series 208 Epoxoprime MVT Penetrating Epoxy Primer (Polyamine Cured) by Tnemec, or approved equivalent product.
 - b. Formulation Description: 100 percent solids.
 - c. Thickness of Coats: Applied at 20 mils Dry Film Thickness (DFT).
 2. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.
 3. Mortar, Where Indicated to Provide Desired Slope for Proper Drainage:
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Series 237 PowerTread by Tnemec, or approved equivalent product.
 - b. Resin: Modified Polyamine Epoxy.
 - c. Formulation Description: 100 percent solids epoxy mixed liquid and aggregate.
 - d. Application Method: Trowel applied.
 - e. Thickness of Coats: Maximum 1 inch thickness per lift.
 - f. Number of Coats: One or Two coats, as necessary.
 4. Body Coat:
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Series 222 Deco-Tread by Tnemec, or approved equivalent product.
 - b. Resin: Manufacturer's standard epoxy.

- c. Formulation Description: 100 percent solids.
 - 1) Application Method: Troweled or screeded, self-levelling with broadcast quartz aggregate to refusal.
 - d. Number of Coats: Not less than two coats, applied uniformly with a minimum 20 mils DFT per coat.
 - e. Thickness of Coats: 1/8 inch.
 - f. Aggregates: Colored quartz aggregate.
- 5. Topcoats: Sealing or finish coats.
 - a. Basis-of-Design Product: Subject to compliance with requirements, provide Series 284 Tneme-Glaze by Tnemec, or approved equivalent product.
 - b. Resin: Manufacturer's standard epoxy.
 - c. Formulation Description: 100 percent solids.
 - d. Type: Clear.
 - e. Finish: Gloss.
 - f. Number of Coats: One or two depending on the desired non-skid surface.
 - 1) Skid resistance properties shall be determined by mock-up at the time of installation.
 - g. Thickness of Coats: 1/8 inch.
- D. Resinous Flooring System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested according to test methods indicated:
 - 1. Compressive Strength: Not less than 15,000 psi unfilled, per ASTM C 579.
 - 2. Tensile Strength: Not less than 2100 psi, average of five tests per ASTM D 638.
 - 3. Flexural Modulus of Elasticity: 2800 psi average of five tests per ASTM C 580.
 - 4. Water absorption: 0.1%, average three tests per ASTM C 413.
 - 5. Impact resistance: 160 inch pounds average, direct impact per ASTM D 2794
 - 6. Abrasion Resistance: 65 mg. loss, average three test after 1000 cycles per ASTM D 4060.
 - 7. Hardness: Shall pass 4B hardness per ASTM D 3363 (pencil).
 - 8. Adhesion: 400 PSI pull-off strength, average three test, 100% concrete failure per ASTM D 4541.
- E. Accessory Materials:
 - 1. Patching and Fill Material: Resinous product approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.

2. Joint Sealant: Type recommended by resinous flooring manufacturer for type of service and joint condition indicated.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry substrate for resinous flooring application.
- B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.
 1. Roughen concrete substrates as follows:
 - a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
 2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written instructions.
 3. Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels according to manufacturer's written instructions.
 - a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with application of resinous flooring only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. of slab area in 24 hours.
 - b. Relative Humidity Test: Use in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
 4. Alkalinity and Adhesion Testing: Verify that concrete substrates have pH within acceptable range. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.
 5. Moisture Testing Failure: Allow sufficient time to retest until substrates pass specified moisture testing requirements or install MVE system as specified in Section 090561.13 Moisture Vapor Emission Control."
 6. Proceed with installation only after concrete substrates pass moisture testing or after installation of moisture-vapor-emission-control membrane.
- C. Patching and Filling: Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.
 1. Control Joint Treatment: Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written instructions.

- D. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.

3.2 APPLICATION

- A. Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.
 - 1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
 - 2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.
 - 3. Expansion and Isolation Joint Treatment: At substrate expansion and isolation joints, comply with resinous flooring manufacturer's written instructions.
- B. Primer: Apply primer over prepared substrate at manufacturer's recommended spreading rate.
- C. Integral Cove Base: Apply cove base mix to wall surfaces before applying flooring. Apply according to manufacturer's written instructions and details, including those for taping, mixing, priming, troweling, sanding, and topcoating of cove base. Round internal and external corners.
 - 1. Integral Cove Base: 4 inches high, unless noted otherwise.
- D. Self-Leveling Body Coats: Apply self-leveling slurry body coats in thickness indicated for flooring system.
- E. Topcoats: Apply topcoats in number indicated for flooring system and at spreading rates recommended in writing by manufacturer and to produce wearing surface indicated.

3.3 PROTECTION

- A. Protect resinous flooring from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by resinous flooring manufacturer.

END OF SECTION 096723

SECTION 096813 - TILE CARPETING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes modular carpet tile.

1.2 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 installation.
 - 4. Pattern of installation.
 - 5. Pattern type, location, and direction.
 - 6. Type, color, and location of edge, transition, and other accessory strips.
 - 7. 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.

1.3 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.

1.4 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.

1.5 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..

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI's "CRI Carpet Installation Standard."

1.7 FIELD CONDITIONS

- A. Comply with CRI's "CRI Carpet Installation Standard" 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.

1.8 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. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. Tandus.
 - 2. Interface.
 - 3. Shaw.
- B. Color: As indicated by manufacturer's designations.
- C. Pattern: Match Architect's samples.
- D. Fiber System: Dynex SD® Nylon.
- E. Primary Backing/Backcoating: Manufacturer's standard composite materials.
- F. Size: As indicated in finish legend.
- G. Applied Treatments:
 - 1. Soil-Resistance Treatment: Manufacturer's standard treatment.
- H. Performance Characteristics:
 - 1. Dry Breaking Strength: Not less than 100 lbf according to ASTM D 2646.
 - 2. Dimensional Tolerance: Within 1/32 inch of specified size dimensions, as determined by physical measurement.
 - 3. Dimensional Stability: 0.2 percent or less according to ISO 2551 (Aachen Test).

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 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. Metal Edge/Transition Strips: Extruded aluminum with mill finish 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 033000 "Cast-in-Place Concrete" and that surfaces are free of cracks, ridges, depressions, scale, and foreign deposits.
 - 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 F 1869. 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 F 2170. 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.
 - 2. Moisture Testing Failure: Allow sufficient time to retest until substrates pass specified moisture testing requirements or install MVE system as specified in Section 090561.13 Moisture Vapor Emission Control."
 - 3. Proceed with installation only after concrete substrates pass moisture testing or after installation of moisture-vapor-emission-control membrane.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Comply with CRI's "Carpet Installation Standards" 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. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.3 INSTALLATION

- A. General: Comply with CRI's "CRI Carpet Installation Standard," Section 18, "Modular Carpet" 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 or as recommended in writing by carpet tile manufacturer.
- 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.

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 CRI's "Carpet Installation Standard," Section 20, "Protecting Indoor Installations."
- 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.

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END OF SECTION 096813

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following interior substrates:
 - 1. Concrete.
 - 2. Steel.
 - 3. Galvanized metal.
 - 4. Wood.
 - 5. Gypsum board.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples for Initial Selection: For each type of topcoat product.
- C. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
 - 1. Submit Samples on rigid backing, 8 inches square.
 - 2. Step coats on Samples to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
 - 5. Draw-Down Samples: Provide (3) "draw-down" samples of each specified sheen, color and finish.
 - 6. Prepare samples of wood for selection of tone and finish by Architect.
- D. Product List: For each product indicated, include the following:
 - 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.

1.3 MAINTENANCE MATERIAL SUBMITTALS

- A. Extra Materials: 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 gal. of each material and color applied.

- B. Coating Maintenance Manual: Provide coating maintenance manual including area summary with finish schedule, area detail designating location where each product by color and finish was used, product data pages, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.4 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft..
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
 - 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.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Storage: Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

- A. Ambient Conditions:
 - 1. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
 - 2. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Benjamin Moore & Co.
 - 2. PPG Architectural Coatings; PPG Paints.
 - 3. Sherwin-Williams Company.
 - 4. Rust-Oleum.
- B. Products: Subject to compliance with requirements, provide one of the products listed in Interior Paint Schedule article in Part 3 below for the paint category indicated.

2.2 PAINT, GENERAL

- A. Material Compatibility:
 - 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- B. Colors: As indicated in a color schedule.

2.3 SOURCE QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
 - 1. Testing agency will perform tests for compliance with product requirements.
 - 2. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 - EXECUTION

3.1 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. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Concrete: 12 percent.
 - 2. Wood: 15 percent.
 - 3. Gypsum Board: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- E. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations and MPI Architectural Painting Specifications Manual as 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.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Preparation of Existing Finished Surfaces To Be Refinished: Conform to the following unless the paint applicator can demonstrate that such paint does not contain lead:
 - 1. Provide local enclosure to limit area of dust scattering.
 - 2. Provide disposable floor and ground protection to catch dust and flakes.
 - 3. Conduct scratch tests to determine adhesion of existing finish. Scrape to remove loose paint.
 - 4. Scrub with detergent and warm, clean water to remove coatings and contaminants. Thoroughly rinse with clean, warm water before washed water dries.
 - 5. Sand edges of pealed areas to provide smooth transition.
 - 6. Sand entire area with fine sandpaper for adhesion.

7. Conduct tests to determine compatibility of existing finish with specified new finish paint systems. Provide barrier coat if required.
 8. After preparation, HEPA vacuum all surfaces within enclosure or within the area.
 9. Wipe all horizontal surfaces.
 10. Remove temporary protection and coverings in a manner to enclose dust and debris within disposable covering and dispose of legally.
- E. Sandblasting: Conform to the following unless the paint applicator can demonstrate that such paint does not contain lead:
1. Provide local enclosure to limit scattering of sand, paint and dust.
 2. Seal duct work openings into the space (supply and return).
 3. Mask of surfaces adjacent to areas of sandblasting as required to not damage the adjacent material or its finish.
 4. Blast substrate clean in accordance with of the (SSPC) Steel Structures Painting Council.
 5. Blast with a media that will not damage the substrate.
 6. After blasting, HEPA vacuum all surfaces within enclosure and within the area.
 7. Wipe all horizontal surfaces.
 8. Remove temporary protection and coverings in a manner to enclose dust and debris within disposable covering and dispose of legally.
- F. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- G. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer.
- H. 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.
- I. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- J. Wood Substrates:
1. Scrape and clean knots and apply coat of knot sealer before applying primer.
 2. Sand surfaces that will be exposed to view and dust off.
 3. Prime edges, ends, faces, undersides, and backsides of wood.

4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
 1. Use applicators and techniques suited for paint and substrate indicated.
 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 1. Paint the following work where exposed in equipment rooms:
 - a. Equipment, including panelboards and switch gear.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.

- g. Tanks that do not have factory-applied final finishes.
 - h. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
- 2. Paint the following work where exposed in occupied spaces:
 - a. Equipment, including panelboards.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
 - h. Other items as directed by Architect.
- 3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 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.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, 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 painted surfaces.

3.6 INTERIOR PAINT SCHEDULE

A. Concrete and Masonry Other Than Concrete Masonry Units:

1. Flat Sheen:

a. Benjamin Moore & Co.:

- 1) Primer (Unpainted Surfaces): Moore Acrylic Masonry Sealer #066.
- 2) First and Second Coats: Ultra Spec 500 Waterborne Zero VOC Paint Flat N536.

b. PPG Architectural Coatings; PPG Paints:

- 1) Primer (Unpainted Surfaces): Speedhide Zero Int. Latex Quick Drying Primer/Sealer, 6-4900XI.
- 2) First and Second Coats: Speedhide Zero Interior Flat Latex, 6-4110XI Series.

c. Sherwin-Williams Company:

- 1) Primer (Unpainted Surfaces): ProMar 200 Zero VOC Interior Latex Primer B28W2600.
- 2) First and Second Coats: ProMar 200 Zero VOC Interior Latex Flat, B30-2650 Series.

d. Rust-Oleum:

- 1) Primer: Zinsser Bulls Eye Zero Acrylic Primer
- 2) First & Second Coats: Zinsser Perma White Interior Acrylic Flat Matte

2. Semi-Gloss Sheen:

a. Benjamin Moore & Co.:

- 1) Primer(Unpainted Surfaces): Moore's Acrylic Masonry Sealer #066.
- 2) First and Second Coats: Ultra Spec 500 Waterborne Zero VOC Semi-Gloss N539.

b. PPG Architectural Coatings; PPG Paints:

- 1) Primer(Unpainted Surfaces): Speedhide Zero Int. Latex Quick Drying Primer/Sealer, 6-4900XI.
- 2) First and Second Coats: Speedhide Zero Interior Flat Latex, 6-4510XI.

c. Sherwin-Williams Company:

- 1) Primer(Unpainted Surfaces)ProMar 200 Zero VOC Interior Latex Primer B28W2600.
- 2) First and Second Coats: ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31-2650 Series.

- d. Rust-Oleum:
 - 1) Primer: Zinsser Bulls Eye Zero Acrylic Primer
 - 2) First & Second Coats: Sierra Performance Beyond No VOC Gloss
- B. Gypsum Board:
 - 1. Flat Sheen:
 - a. Benjamin Moore & Co.:
 - 1) Primer (Unpainted Surfaces): Ultra Spec 500 Waterborne Zero VOC Primer Sealer N534.
 - 2) First and Second Coats: Ultra Spec 500 Waterborne Zero VOC Flat N536.
 - b. PPG Architectural Coatings; PPG Paints:
 - 1) Primer (Unpainted Surfaces): Speedhide Zero Int. Latex Quick Drying Primer/Sealer, 6-4900XI.
 - 2) First and Second Coats: Speedhide Zero Interior Semi-Gloss Latex 1, 6-4110XISeries.
 - c. Sherwin-Williams Company:
 - 1) Primer (Unpainted Surfaces): ProMar 200 Zero VOC Interior Latex Primer, B28W2600.
 - 2) First and Second Coats: ProMar 200 Zero VOC Interior Latex Flat, B30-2650 Series.
 - d. Rust-Oleum:
 - 1) Primer: Zinsser Bulls Eye Zero Acrylic Primer
 - 2) First & Second Coats: Zinsser Perma White Interior Acrylic Flat Matte
 - 2. Low-Luster, Satin or Eggshell Sheen:
 - a. Benjamin Moore & Co.:
 - 1) Primer (Unfinished Surfaces): Ultra Spec 500 Waterborne Interior Primer Sealer N534.
 - 2) First and Second Coats: Ultra Spec 500 Waterborne Zero VOC Eggshell Enamel N538.
 - b. PPG Architectural Coatings; PPG Paints:
 - 1) Primer (Unfinished Surfaces): Speedhide ZeroLatex Quick Drying Primer/Sealer, 6-4900XI.
 - 2) First and Second Coats: Speedhide Zero Interior Eggshell Latex 6-4310 Series.

- c. Sherwin-Williams Company:
 - 1) Primer (Unfinished Surfaces): ProMar 200 Zero VOC Interior Latex Primer, B28W2600.
 - 2) First and Second Coats: ProMar 200 Zero VOC Interior Latex Eg-Shel, B20-2650 Series.
 - d. Rust-Oleum:
 - 1) Primer: Zinsser Bulls Eye Zero Acrylic Primer
 - 2) First & Second Coats: Sierra Performance Beyond No VOC Satin
3. Semi-Gloss Sheen:
- a. Benjamin Moore & Co.:
 - 1) Primer (Unfinished Surfaces): Ultra Spec 500 Waterborne Zero VOC Primer Sealer N534.
 - 2) First and Second Coats: Ultra Spec 500 Waterborne Zero VOC Semi-Gloss N539 (VOC 0 g/L fully tinted).
 - b. PPG Architectural Coatings; PPG Paints:
 - 1) Primer (Unfinished Surfaces): Speedhide Zero Int. Latex Quick Drying Primer/Sealer, 6-4900 XI.
 - 2) First and Second Coats: Speedhide Zero Interior Latex Semi-Gloss 6-4510XI Series.
 - c. Sherwin-Williams Company:
 - 1) Primer (Unfinished Surfaces): ProMar 200 Interior Latex Primer, B28W2600.
 - 2) First and Second Coats: ProMar 200 Zero VOC Interior Latex S/G, B31-2650 Series.
 - d. Rust-Oleum:
 - 1) Primer: Zinsser Bulls Eye Zero Acrylic Primer
 - 2) First & Second Coats: Sierra Performance Beyond No VOC Gloss
- C. Woodwork and Hardboard Painted:
- 1. Satin or Eggshell Sheen:
 - a. Benjamin Moore & Co.:
 - 1) Primer (Unfinished Surfaces): Fresh Start 100% Acrylic Superior Primer 046.
 - 2) First and Second Coats: Ultra Spec 500 Waterborne Interior Eggshell N538.

- b. PPG Architectural Coatings; PPG Paints:
 - 1) Primer (Unfinished Surfaces): Speedhide Zero Int. Latex Quick Drying Primer/Sealer, 6-4900XI.
 - 2) First and Second Coats: Speedhide Zero Interior Eggshell Latex Enamel, 6-4310XI Series.
 - c. Sherwin-Williams Company:
 - 1) Primer (Unfinished Surfaces): Premium Interior Wall and Wood Primer B28W8111 or ProMar 200 Zero VOC Interior Latex Primer B28W2600.
 - 2) First and Second Coats: ProMar 200 Zero VOC Interior Latex Eg-Shel, B20-2600 Series.
 - d. Rust-Oleum:
 - 1) Primer: Zinsser Bulls Eye Zero Acrylic Primer
 - 2) First & Second Coats: Sierra Performance Beyond No VOC Satin
2. Semi-Gloss Sheen:
- a. Benjamin Moore & Co.:
 - 1) Undercoat (Unfinished Surfaces): Fresh Start 100% Acrylic Superior Primer 046.
 - 2) First and Second Coats: Ultra Spec 500 Waterborne Interior Zero VOC Semi-Gloss 539.
 - b. PPG Architectural Coatings; PPG Paints:
 - 1) Undercoat (Unfinished Surfaces): Speedhide Zero Int. Latex Quick Drying Primer/Sealer, 6-4900XI.
 - 2) First and Second Coats: Speedhide Zero Interior Semi-Gloss Latex Enamel, 6-4510XI Series.
 - c. Sherwin-Williams Company:
 - 1) Undercoat (Unfinished Surfaces): Premium Interior Latex Wall & Wood Primer, B28W8111 or ProMar 200 Zero VOC Interior Latex Primer B28W2600.
 - 2) First and Second Coats: ProMar 200 Zero VOC Interior Latex S/G, B31-2600 Series.
 - d. Rust-Oleum:
 - 1) Primer: Zinsser Bulls Eye Zero Acrylic Primer
 - 2) First & Second Coats: Sierra Performance Beyond No VOC Gloss

3. Full Gloss Sheen:
 - a. Benjamin Moore & Co.:
 - 1) Undercoat (Unfinished Surfaces): Fresh Start 100% Acrylic Superior Primer 046.
 - 2) First and Second Coats: Ultra Spec 500 Waterborne Interior Gloss N540.
 - b. PPG Architectural Coatings; PPG Paints:
 - 1) Undercoat (Unfinished Surfaces): Speedhide Zero Int. Latex Quick Drying Primer/Sealer, 6-4900XI.
 - 2) First and Second Coats: Lifemaster No VOC Gloss 9400.
 - c. Sherwin-Williams Company:
 - 1) Undercoat (Unfinished Surfaces): Premium Interior Latex Wall & Wood Primer, B28W8111.
 - 2) First and Second Coats: ProMar 200 Latex Gloss, B11-2200 Series.
 - d. Rust-Oleum:
 - 1) Primer: Zinsser Bulls Eye Zero Acrylic Primer
 - 2) First & Second Coats: Sierra Performance Beyond No VOC Gloss
- D. Mechanical and Electrical Items: Use 3-coat system best suited to substrate, satin finish. Use heat resistant materials where required.
- E. Ferrous Metal:
 1. Satin or Eggshell Sheen:
 - a. Benjamin Moore & Co.:
 - 1) Primer (Unfinished Surfaces): Acrylic Metal Primer P04.
 - 2) First and Second Coats: Ultra Spec 500 Waterborne Interior Eggshell N538.
 - b. PPG Architectural Coatings; PPG Paints:
 - 1) Primer (Unfinished Surfaces): Pitt Tech Plus WB Int./Ext. Industrial Primer DTM 90-912 Series.
 - 2) First and Second Coats: Speedhide Zero Interior Eggshell Latex Enamel, 6-4310XI Series.
 - c. Sherwin-Williams Company:
 - 1) Primer (Unfinished Surfaces): B66W1 DTM Acrylic Primer/Finish.
 - 2) First and Second Coats: ProMar 200 Zero VOC Interior Latex Eg-Shel, B20-2600 Series.

- d. Rust-Oleum:
 - 1) Primer: Zinsser Bulls Eye Zero Acrylic Primer
 - 2) First & Second Coats: Sierra Performance Beyond No VOC Satin
- 2. Semi-Gloss Sheen:
 - a. Benjamin Moore & Co.:
 - 1) Primer (Unfinished Surfaces): Acrylic Metal Primer P04.
 - 2) First and Second Coats: Ultra Spec 500 Waterborne Interior Semi-Gloss N539.
 - b. PPG Architectural Coatings; PPG Paints:
 - 1) Primer (Unfinished Surfaces): Pitt Tech Plus WB Int./Ext. Industrial Primer DTM 90-912 Series.
 - 2) First and Second Coats: Speedhide Zero Interior Semi-Gloss Latex Enamel, 6-4510XI Series.
 - c. Sherwin-Williams Company:
 - 1) Primer (Unfinished Surfaces): B66W1 DTM Acrylic Primer/Finish.
 - 2) First and Second Coats: ProMar 200 Zero VOC Interior Latex S/G, B31-2600 Series.
 - d. Rust-Oleum:
 - 1) Primer: Zinsser Bulls Eye Zero Acrylic Primer
 - 2) First & Second Coats: Sierra Performance Beyond No VOC Gloss
- F. Zinc-Coated (Galvanized) Metal:
 - 1. Satin or Egg-Shell Sheen:
 - a. Benjamin Moore & Co.:
 - 1) Primer (Unfinished Surfaces): Super Spec HP Acrylic Metal Primer P04.
 - 2) First and Second Coats: Ultra Spec 500 Waterborne Interior Zero VOC Eggshell N538.
 - 3) First and Second Coats: Ultra-Hide No VOC Eggshell Paint 1411.
 - b. PPG Architectural Coatings; PPG Paints:
 - 1) Primer (Unfinished Surfaces): Pitt Tech Plus WB Int./Ext. Industrial Primer DTM 90-912 Series.
 - 2) First and Second Coats: Speedhide Zero Interior Eggshell Latex Enamel, 6-4310XI Series.

- c. Sherwin-Williams Company:
 - 1) Primer (Unfinished Surfaces): B66W1 DTM Acrylic Primer/Finish.
 - 2) First and Second Coats: ProMar 200 ZeroVOC Latex Eg-Shel, B20-2600 Series.
- d. Rust-Oleum:
 - 1) Primer: Zinsser Bulls Eye Zero Acrylic Primer
 - 2) First & Second Coats: Sierra Performance Beyond No VOC Satin
- 2. Semi-Gloss Sheen:
 - a. Benjamin Moore & Co.:
 - 1) Primer (Unfinished Surfaces): Super Spec HP Acrylic Metal Primer P04.
 - 2) First and Second Coats: Ultra Spec 500 Waterborne Interior Semi-Gloss N539.
 - b. PPG Architectural Coatings; PPG Paints:
 - 1) Primer (Unfinished Surfaces): Pitt Tech Plus WB Int./Ext. Industrial Primer DTM 90-912 Series.
 - 2) First and Second Coats: Speedhide Zero Interior Semi-Gloss Latex Enamel, 6-4510XI Series.
 - c. Sherwin-Williams Company:
 - 1) Primer (Unfinished Surfaces): B66W1 DTM Acrylic Primer/Finish.
 - 2) First and Second Coats: ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series.
 - d. Rust-Oleum:
 - 1) Primer: Zinsser Bulls Eye Zero Acrylic Primer
 - 2) First & Second Coats: Sierra Performance Beyond No VOC Gloss

END OF SECTION 099123

SECTION 099600 – HIGH-PERFORMANCE COATINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and the application of high-performance coating system on the following substrates:
 - 1. Interior Substrates:
 - a. Gypsum board.

1.2 DEFINITIONS

- A. Gloss Level 5: 35 to 79 units at 60 degrees, according to ASTM D 523.
- B. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- C. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Indicate VOC content.
- B. Samples for Verification: For each type of coating system and each color and gloss of topcoat indicated.
 - 1. Submit Samples on rigid backing, 8 inches square.
 - 2. Apply coats on Samples in steps to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- C. Product List: Cross-reference to coating system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

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. Coatings: 5 of each material and color applied.

- B. Coating Maintenance Manual: Provide coating maintenance manual including area summary with finish schedule, area detail designating location where each product by color and finish was used, product data pages, care and cleaning instructions, touch-up procedures, and color samples of each color and finish used.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

- A. Apply coatings only when temperature of surfaces to be coated and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply coatings when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
- C. Do not apply exterior coating in snow, rain, fog, or mist.
- D. Concrete Floors: Provide all necessary protection for concrete floors to receive high performance coating from construction traffic from time when surface is walkable until acceptance of high performance coating application. Provide, at no additional cost to Owner, additional cleaning or mechanical abrasion/polishing of concrete surface where construction traffic has rendered the concrete surface unacceptable to receive high performance coating.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers:
 - 1. Benjamin Moore & Co.
 - 2. PPG Architectural Coatings, PPG Paints.
 - 3. Sherwin-Williams Company.
 - 4. Tnemec Company, Inc.
- B. Products: Subject to compliance with requirements, available products that may be incorporated include products listed in Exterior High-Performance Coating Schedule or Interior High-Performance Coating Schedule for coating category indicated.

2.2 HIGH-PERFORMANCE COATINGS, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
3. Prove products of same manufacturer for each coat in coating system.

B. Performance Requirements:

1. Provide products equal to or less than emission limits emanating from paints and coatings that do not result in building air concentrations greater than limits specified below when tested using Standard Method for the Testing and Evaluation of Volatile Organic Chemical emission from Indoor Sources Using Environmental Chambers Version 1.1 (2010), <http://www.cal-iaq.org/vocs/standard-method-for-voc-emissions-testing-and-evaluation>. Provide testing data current within 12 months preceding submission specified in Submittals Article in Part 1 of this Section.
 - a. Emission Limits:
 - 1) Formaldehyde: 7.3 ppb.
 - 2) TVOC: 0.5 mg/cubic meter.
 - 3) Total Aldehydes: 43 ppb.
 - b. Include in submittal listing of measured carcinogens and reproductive toxins identified by California 65, the U.S. National Toxicology Program (NTP), and the International Agency on Research on Cancer (IARC). Ensure any pollutants in paints and coatings not listed comply with the following:
 - 1) Air concentration level no greater than 1/100 the Threshold Limit Value (TLV) industrial workplace standard (Reference: American Conference of Government Industrial Hygienists, 6500 Glenway, Building D07, Cincinnati, Ohio 45211-4438).
 - 2) Air concentration level no greater than 1/2 CA Chronic reference Exposure Level (CREL) (<http://www.oehha.ca.gov/air/allchrels.html>) adopted by State of California Office of Environmental Health Hazard Assessment (OEHHA) as "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using environmental Chambers Version 1.1" Dated February 2010, Table 4.1.
2. Recycled and Bio-Based Content: Give preference to products containing recycled material and bio-based content.

C. Colors: As indicated in color schedule.

PART 3 - EXECUTION

3.1 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. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Gypsum Board: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- E. Proceed with coating applications only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. 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.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- B. Clean substrates of substances that could impair bond of coatings, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce coating systems indicated.

3.3 APPLICATION

- A. Apply high-performance coatings according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" including, but not limited to, manufacturer's instructions and recommendations for safety and ventilation.
 - 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, identifications, performance rating, or nomenclature plates.
- B. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.
- C. Do not allow excess time to elapse following application of epoxy type coatings, as determined by the manufacturer; document manufacturer's recommendation for the Architect's information.
- D. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of the same material are to be applied. Tint undercoats to match color of finish coat but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- E. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color and appearance.
- F. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.
- G. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Produce sharp glass lines and color breaks.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test coatings for dry film thickness.
1. Contractor shall touch up and restore coated surfaces damaged by testing.
 2. If test results show that dry film thickness of applied coating does not comply with coating manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with coating manufacturer's written recommendations.

3.5 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 to work of other trades by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of trades, touch up and restore damaged or defaced coated surfaces.

3.6 INTERIOR HIGH-PERFORMANCE COATING SCHEDULE

A. Gypsum Board Substrates:

1. Epoxy-Modified Latex System:

a. Benjamin Moore & Company:

- 1) Prime Coat: Fresh Start All Purpose 100% Acrylic Primer 023.
- 2) Intermediate Coat: Epoxy-modified latex, matching topcoat.
- 3) Topcoat – Semi-Gloss: Super Spec HP Acrylic Epoxy Coating P43.

b. PPG Paints:

- 1) Prime Coat: SPEEDHIDE Zero 6-4900XI Interior Latex Sealer Quick-Drying.
- 2) Intermediate Coat: Epoxy-modified latex, matching topcoat.
- 3) Topcoat – Semi-Gloss: Pitt Glaze WB 16-510 Series Pre-Catalyzed Water Based Acrylic Epoxy.

c. Sherwin-Williams Company:

- 1) Prime Coat: Pro Mar 200 Zero VOC Interior Latex Primer.
- 2) Intermediate Coat: Epoxy-modified latex, matching topcoat.
- 3) Topcoat – Semi-Gloss: Water Based Catalyzed Epoxy B60V25 Series.

d. Tnemec Company, Inc.:

- 1) Prime Coat: Series 51-1051 Elasto-Grip.
- 2) Intermediate Coat: Series W.B. Typoxy.
- 3) Topcoat – Semi-Gloss: Series 267 Tname-Glaze.

e. Rust-Oleum:

- 1) Prime: Rust-Oleum Zinsser Bulls Eye Zero Primer
- 2) Intermediate: Rust-Oleum Sierra Performance S60 WB Epoxy
- 3) Top Coat: Rust-Oleum Sierra Performance S60 WB Epoxy

END OF SECTION 099600

SECTION 101400 - CODE REQUIRED SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Permanent room or space identification signage, interior and exterior.
 - 2. Directional and Informational signage - interior.
 - 3. Fire code / life safety signage - interior.

1.2 REGULATORY REQUIREMENTS

- A. Comply with signage requirements of the 2010 ADA Standards for Accessible Design (ADAS), as currently amended.
- B. Where more restrictive than 2010 ADA Standards for Accessible Design (ADAS), comply with applicable provisions in the International Building Code, including Appendix E, and ICC/ANSI A117.1.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings:
 - 1. Indicate sign size, message, and mounting.
 - 2. Identify mounting location and alignment with adjacent construction and features.
 - 3. Submit reproducible copies in ledger format 11-inches by 17 inches, for signs and graphic work at large scale. Half-scale drawings will be sufficient for sign faces 12-inches by 12 inches or larger.
 - 4. Show joints, anchorage to structure, accessory items, and finishes. Submit Drawings of typical sign faces showing copy layout.
 - 5. Show sign mounting heights, locations of supplementary supports to be provided by other Sections, and accessories.
 - 6. Provide message list, typestyles, graphic elements, including tactile characters and Braille, and layout for each sign.
- C. Samples for Initial Selection: For each type of sign indicated. Include Samples of accessories involving color selection.
 - 1. Color Range: Submit two brochures or other approved submittal of full color range available for each signage application.

2. Submit two samples of representative signage illustrating dimensional characteristics, finish and sheen for Architect's selection.
 3. Submit samples of representative tactile/braille signage illustrating letter stroke proportions and braille dot size, spacing and characteristics.
- D. Samples for Verification:
1. Dimensional Characters: Full-size Samples of each type of dimensional character (letter, number, and graphic element).
 2. Acrylic Sheet: 8 by 10 inches for each color required.
 3. Panel Signs: Not less than 12 inches square.
- E. Sign Schedule: For all signage.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Certification:
1. Certification: Accompanying submittal, provide manufacturers/signage fabricator's written certification stating signs as designed comply with applicable criteria of ADA and the IBC, including letter style, spacing and size.
 2. Prior to installation, provide manufacturers/sign fabricator's written certification stating tactile and braille signs comply with specified criteria, including proof-reading requirements.

1.5 QUALITY ASSURANCE

- A. Manufacturer/Fabricator:
1. Have produced specified products or similar products for minimum of 5 years prior to submitting Bid, and have used products in similar scope, on projects of similar scale and type.
 2. Has capacity to produce and deliver products on schedule as required for the Work.
 3. All manufacture and fabrication completed in United States of America.
- B. Installing Contractor Qualifications:
1. Certified, licensed, or otherwise approved by manufacturer as experienced with sufficient trained staff to install manufacturer's products according to specified requirements and manufacturer's requirements and recommendations.
 2. Has installed specified or similar products on minimum five (5) projects of similar scale and type within five (5) years prior to Bid.

- C. Source Limitations for Signs: Obtain each type of sign indicated from one source from a single manufacturer.
- D. Pre-Installation Conference: Conduct conference at Project site.

1.6 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit installation of signs in exterior locations according to manufacturers' written instructions and warranty requirements.
- B. Field Measurements: Verify sign locations by field measurements before fabrication and indicate measurements on Shop Drawings as required or as specified in Drawings.

1.7 COORDINATION

- A. For signs supported by or anchored to permanent construction, advise installers of anchorage devices about specific requirements for placement of anchorage devices and similar items to be used for attaching signs.
 - 1. For signs supported by or anchored to permanent construction, furnish templates for installation of anchorage devices.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site. Store and protect under provisions of Division 01.

1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Five (5) years from Date of Substantial Completion.
 - 2. Failures include, but are not limited to, the following:
 - a. Deterioration of finishes beyond normal weathering.
 - b. Deterioration of embedded graphic images.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Characteristics of specific products named in this Section are indicated to establish required level of quality, appearance, and performance. Architect will consider requests for substitutions in accordance with provisions and procedures specified in Division 01.

2.2 PERMANENT ROOM IDENTIFICATION SIGNAGE

- A. Manufacturers:
1. Best (Basis of Design).
 2. ASI Signage.
 3. H. Toji.
 4. EMG.
 5. Encompass.
 6. Park Place Sign Systems.
- B. Type: Custom fabricated signage system, based on thermoforming process resulting in a compression formed single dimensional sign component.
1. Series: Impressions Premium Series (Basis of Design).
- C. Material Characteristics: 1/8-inch thick panel.
1. Pictogram Process: Contrasting color with background, Surface 1 graphic application.
 2. Panel: Extruded Engineered PVC/Acrylic alloy with integral background colors.
 3. Panel: Extruded Engineered PVC/Acrylic alloy with integral background colors, with Class 1A fire rating per ASTM E 84.
 4. Rockwell Hardness: 94.
 5. Impact Resistance: 15 foot-pounds/inch.
- D. Sign Design and Style Criteria:
1. Letter Style: Upper case Myriad Pro Regular (Optical Kerning).
 2. Provide manufacturer's standard rectangular profile shape.
 - a. Corners: Manufacturer's standard Square.
 - b. Edge: Manufacturer's standard Beveled 45 degrees Bullnose.
 - c. Surface Texture: Matte.

3. Pictogram Criteria: Where pictograms are specified as room identification signage, provide pictogram centered in minimum 6-inch-high space with no text or braille within this space. Provide tactile and braille message centered below pictogram.
- E. Tactile Criteria:
1. Character Size: 5/8-inch minimum, maximum 2-inch height, raised 1/32 inch above surface.
 2. Braille Criteria:
 - a. Provide contracted Grade 2 braille complying with ADA 703.3 IBC E107.2.
 - b. Provide dots raised 1/40-inch above surface, with rounded or eased profile. Square or sharp-edged dots not acceptable.
- F. Sign Message ADA 216.2:
1. Wall Mounted Room Identification RS-#: Unless otherwise indicated, provide tactile signs at rooms as shown on Drawings:
 - a. Toilet Room Signage: RS-1 designated gender as indicated, with symbol of accessibility pictogram as shown.
 - b. Unisex Toilet Room Signage: RS-2 as indicated, with symbol of accessibility pictogram as shown.
 - c. Family Toilet Room Signage: RS-3 as indicated, with symbol of accessibility pictogram as shown.
 - d. Accessible Entrances: RS-4 as indicated, with symbol of accessibility pictogram as shown. ADA 216.6.
 2. Means of Egress Signage – ME-#: Provide tactile signs at all means of egress components as indicated ADA 216.4// IBC ANSI 1111.3:
 - a. Wall Mounted Exit Identification: Provide signs at all door locations with exit signs as required by IBC 1111.3.2 indicating the path of exit travel within the means of egress system.
 - 1) Message at All Exits: EXIT – ME-1.
 - 2) Message at All Path of Egress Conditions: EXIT ROUTE. – ME-2.
 - b. Delayed Egress Locks – ME-3: Provide signs at all door locations with delayed access locking as required by IBC 1010.1.9.
 - 1) Message shall include directions on operation and alarm.
 3. Symbols: Provide symbol of accessibility pictogram.
 - a. Area of Refuge and Exterior Areas of Rescue Assistance – ME-10: In areas of refuge and areas of rescue assistance, provide signs on instructions on the use of the area

under emergency conditions, including use of two-way communication as required by IBC 1009.11.

G. Finish/Contrast/Color:

1. Finish: Provide sign with matte, non-reflective finish, with a maximum 11-19-degree gloss on 60-degree dosimeter.
2. Contrast: Provide signs with minimum light to dark contrast between background and message of 70 percent
 - a. Provide light color with minimum LRV of 45.
3. Color:
 - a. Background/Dark Color: As selected from manufacturer's standard colors.
 - b. Message/light color: As selected from manufacturer's standard colors.

H. Mounting: Verify surfaces with irregular or rough finish have been properly finished to establish flush installation.

1. Interior: Unless noted otherwise, provide 3M VHB tape mounting.
2. Exterior: Unless noted otherwise, provide mechanical fastener mounting.

I. Fabrication Certification: Prior to installation, provide written certification stating permanent signage has been proofread by Library of Congress certified readers or approved alternate certification.

2.3 INTERIOR DIRECTIONAL AND INFORMATIONAL SIGNAGE – DS-#

A. Manufacturers:

1. Best (Basis of Design).
2. ASI Signage.
3. H. Toji.
4. EMG.
5. Encompass.
6. Park Place Sign Systems.

B. Type: Custom fabricated signage system, manufactured/fabricated by the same permanent room signage fabricator.

C. Material Characteristics: 1/8-inch 1/4-inch thick panel.

1. Pictogram Process: Contrasting color with background, Surface 1 graphic application.
2. Panel: Extruded Engineered PVC/Acrylic alloy with integral background colors.

3. Panel: Extruded Engineered PVC/Acrylic alloy with integral background colors, with Class 1A fire rating per ASTM E 84.
4. Rockwell Hardness: 94.
5. Impact Resistance: 15 foot-pounds/inch.
- D. Graphic Image Process: Applied digital graphic image over substrate panel using UV stabilized coatings.
- E. Sign Size, Design, and Style Criteria:
 1. Character Size: As required to comply with viewing distance criteria as defined by ADA 703.5.
 2. Provide manufacturer's standard rectangular profile shape:
 - a. Corners: Manufacturers Standard Radiused Chamfered.
 - b. Edges: Manufacturers Standard Radiused Beveled Eased.
 3. Letter Style: Upper case Myriad Pro Regular (Optical Kerning).
- F. Sign Message: Provide signage with message as specified in this Section.
 1. Accessible Entrances – DS-1: Provide sign with ISA at each entrance.
 - a. Where building entrance is not accessible, provide sign providing direction to nearest accessible element. Locate at inaccessible building entrances without accessible means of egress.
 - b. Provide sign with International Symbol of Accessibility and directional arrow as required to indicate accessible route to accessible entrance.
 2. Assistive Listening Device Signage DS-2: Provide signs indicating availability of assistive listening devices in compliance with IBC 1111.3.1. In addition, provide message on sign stating, "Contact Facility Staff To Make Arrangements For Listening Device" per IBC 1111.3.1."
 3. Path of Travel Directional Signage – DS-3:
 - a. Where building element, such as a toilet, drinking fountain, dressing, fitting or locker room, exits or elevator are not accessible, provide sign at inaccessible element providing direction to nearest accessible element.
 - b. Provide sign with International Symbol of Accessibility and directional arrow as required to indicate accessible route to accessible element.
 - c. Mounting: Wall.
 4. TTY Signage DS-4: Provide signs identified by the International Symbol of TTY as required by ADA 216.9// IBC E106.4.9.

5. Telephones DS-5: Where public telephones are provided, including intercom and courtesy phones, provide signs as required by ADA 217.1// IBC E106.1.
6. Check Out Aisles DS-6: Where all check out aisles are not accessible, provide symbol of accessibility at accessible checkout aisles/stations, at same location as other checkout aisles.
7. Live Load DS--7: Provide signage on floor or area where design live floor loads exceed 50 PSF per IBC 196.1. //IBC 106.1.
8. No Smoking DS-8: Provide no smoking signs as required by IFC 310.3.

G. Finish/Contrast/Color:

1. Finish: Provide signs with matte, non-reflective finish, with a maximum 11-19-degree gloss on 60-degree dosimeter.
2. Contrast: Provide signs with minimum light to dark contrast between background and message of 70 percent.
3. Color:
 - a. Background/Dark Color: As selected from manufacturers standard colors.
 - b. Message/Light Color: As selected from manufacturer's standard colors.
 - c. International Symbol of Accessibility: Solid White, satin finish on blue approximating FS15090 in Federal Standard 595, unless other colors with equivalent contrast are approved by AHJ.

H. Mounting at Wall: Unless otherwise indicated, provide 3M VHB tape mounting.

1. Verify surfaces with irregular or rough finish have been properly finished to establish flush and lip free installation.

2.4 FIRE CODE INFORMATIONAL AND DIRECTIONAL SIGNAGE – FDS-#

A. Manufacturers:

1. Best (Basis of Design).
2. ASI Signage.
3. H. Toji.
4. EMG.
5. Encompass.
6. Park Place Sign Systems.
7. Or equal.

- B. Type: Non-illuminated flat panel sign.
- C. Size and Construction: Unless specified otherwise, comply with directional sign criteria as specified in Article 2.3 of this Section.
 - 1. Thickness: 1/4 inch.
 - 2. Sign Image Size: As shown on Drawings.
 - 3. Mounting Height: As indicated on Drawings.
- D. Sign Content:
 - 1. Occupant Limit Sign – FDS-1: Provide sign with occupant limit number based on occupant load as shown on approved Drawings and as required by IBC 1004.3.
 - a. Mounting: Wall.
 - 2. Fire Door Signage: Provide signs at each fire door as required by IFC 703.2.1 as required by Fire Marshal.
 - a. Mounting: Wall.
 - 3. Electrical Rooms Signage: Provide signs as required by IFC 605.3.1 at rooms containing electrical control panels as required by Fire Marshal.
 - a. Mounting: Wall Door.
 - 4. Fire Control Equipment Signage: Provide signs as required by IBC 914.1 at rooms containing shafts, electrical control panels, air conditioning systems, sprinkler risers and valves, and other fire detection/suppression elements as required by Fire Marshal.
 - a. Mounting: Wall Door.
 - 5. Delayed Egress Locks – FDS-2: Provide signs at all door locations with delayed access locking as required by IBC 1010.1.9.7.
 - a. Message shall include directions on operation and alarm.
 - 6. Main Entrance Door Locking – FDS-3: Provide signs at main entrance door as required by IBC 1010.1.9.3.
 - a. Include in message "THIS DOOR TO REMAIN UNLOCKED WHEN THIS SPACE IS OCCUPIED".

2.5 ACCESSORIES

- A. Mounting Methods:
 - 1. Unless noted otherwise, use concealed fasteners fabricated from materials that are not corrosive to sign material and mounting surface.
 - 2. Provide exposed fasteners at exterior conditions where indicated.

- B. Anchors and Inserts: Provide nonferrous-metal or stainless-steel 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. Concrete: Provide Portland cement concrete, 1-1/4-inch max coarse aggregate, 3,000 psi compressive strength, for all footings shown on Drawings.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

- A. Inspection:
 - 1. Prior to work of this Section, carefully inspect previously installed work. Verify all such work is complete to the point where this installation may properly commence.
 - 2. Verify that work of this Section may be installed in strict accordance with the original design, all pertinent codes and regulations, and all pertinent portions of the referenced standards.
 - 3. In the event of discrepancy, immediately notify the Architect.
 - 4. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.2 INSTALLATION

- A. General Criteria:
 - 1. Install in accordance with manufacturer's instructions and approved submittals.
 - 2. Coordinate location of all signage with Architect.
 - 3. Install on clean and properly prepared surfaces.
- B. Installation Method:
 - 1. Double Sided Tape: Mount signs to smooth, nonporous surfaces. Do not use this method for vinyl-covered or rough surfaces.
 - 2. Shim Plate Mounting: Provide 1/8-inch- thick, concealed aluminum shim plates with predrilled and countersunk holes, at locations indicated, and where other mounting methods are not practicable. Attach plate with fasteners and anchors suitable for secure attachment to substrate. Attach panel signs to plate using method specified above.
 - 3. Mechanical Fasteners: Use countersunk spanner head or countersunk non-removable mechanical fasteners placed through predrilled holes. Attach signs with fasteners and anchors suitable for secure attachment to substrate as recommended in writing by sign manufacturer.

4. Where signs are installed on glass panels, provide back plate matching sign at opposite side of glass, mounted as specified.
- C. Permanent Room and Means of Egress Signage:
 1. Install signs after substrate surfaces receive final finish.
 2. Locate on strike side of door or as directed by Architect.
 3. Center signage at 48 inches minimum above finish floor, measured to baseline of the lowest raised character, and 60 inches maximum above finished floor, measured to the baseline of the highest line of raised characters.
 4. When sign is installed on window surface or other similar recessed conditions, provide spacer as required to maintain sign face within 3 inches of outermost wall plane.
 5. Locate signage so that a minimum area 18 inches by 18 inches square clear space, centered on the centerline of the tactile characters, is provided beyond the arc of any door swing.
- D. Permanent Directional Signage and Fire Code Signage:
 1. Install signs after substrate surfaces receive final finish.
 2. Mounting:
 - a. Place signage in compliance with character size and viewing distance per ADA 703.5 and IBC E107.3 and as shown on Drawings.
 - b. Where signage occurs within path of travel, install bottom of sign minimum 80 inches above finish floor.
- E. Exterior Numerals: Install as shown on Drawings.

3.3 CLEANING AND PROTECTION

- A. Shop clean signs at time of final fabrication. After installation is completed, installer shall carefully clean signs, removing dirt, stains, and other site incident defacements.
- B. Clean signs in accordance with product manufacturer's instructions. Do not use stainless steel or other metal wire brushes or wool. Use of acid or other solutions which may cause discoloration is expressly prohibited.
- C. Protect finished work with suitable boxing or covering. Protect signage work in progress at all times during construction using suitable strong, impervious film or fabric securely held in place.
- D. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

END OF SECTION 101400

SECTION 102123 - CUBICLE CURTAINS AND TRACK

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Cubicle-curtain tracks and carriers.
 - 2. Cubicle curtains.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For tracks.
 - 1. Show layout and types of cubicles, number of carriers, anchorage details, and conditions requiring accessories. Indicate dimensions taken from field measurements.
 - 2. Include details of blocking for track support.
- C. Samples for Verification: For each type of product required, prepared on Samples of size indicated below:
 - 1. Curtain Track: Not less than 10 inches long.
 - 2. Curtain Carrier: Full-size unit.

1.3 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For curtains, tracks, and hardware to include in operation and maintenance manuals.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Curtain Carriers and Track End Caps: Full-size units equal to 3 percent of amount installed for each size indicated, but no fewer than 10 units.

PART 2 - PRODUCTS

2.1 CUBICLE-CURTAIN SUPPORT SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. A. R. Nelson Co.
 - 2. Construction Specialties, Inc.

3. InPro Corporation (IPC).
- B. Extruded-Aluminum Curtain Track: Not less than 1-1/4 inches wide by 3/4 inch high .
 1. Track Minimum Wall Thickness: 0.062 inch .
 2. Curved Track: Factory-fabricated, 24-inch- radius bends.
 3. Finish: Clear anodized.
- C. Curtain Track Accessories: Fabricate splices, end caps, connectors, end stops, coupling and joining sleeves, wall flanges, brackets, ceiling clips, and other accessories from same material and with same finish as track.
 1. End Stop: Removable with carrier hook.
- D. Curtain Roller Carriers: Two nylon rollers and nylon axle with nylon hook.
- E. Exposed Fasteners: Stainless steel.

2.2 CURTAINS

- A. Shower curtains provided by Owner.

PART 3 - EXECUTION

3.1 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. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install tracks level and plumb, according to manufacturer's written instructions.
- B. For tracks of up to 20 feet in length, provide track fabricated from single, continuous length.
 1. Curtain-Track Mounting: Surface.
- C. Surface-Track Mounting: Fasten tracks to ceilings at intervals recommended by manufacturer. Fasten tracks to structure at each splice and tangent point of each corner. Center fasteners in track to ensure unencumbered carrier operation. Attach track to ceiling as follows:
 1. Mechanically fasten directly to finished ceiling with toggle bolts.

- D. Track Accessories: Install splices, end caps, connectors, end stops, coupling and joining sleeves, and other accessories as required for a secure and operational installation.
- E. Curtain Carriers: Provide curtain carriers adequate for 6-inch spacing along full length of curtain plus an additional carrier.
- F. Cubicle Curtains: Hang curtains on each curtain track. Secure with curtain tieback.

END OF SECTION 102123

SECTION 102600 - WALL AND DOOR PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wall guards.
 - 2. Impact-resistant handrails and replacement covers.
 - 3. Corner guards.
 - 4. Impact-resistant wall coverings.

1.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide handrails capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Uniform load of 50 lbf/ft. applied in any direction.
 - 2. Concentrated load of 200 lbf applied in any direction.
 - 3. Uniform and concentrated loads need not be assumed to act concurrently.

1.3 ACTION SUBMITTALS

- A. Product Data: Include construction details, material descriptions, impact strength, fire-test-response characteristics, dimensions of individual components and profiles, and finishes for each impact-resistant wall protection unit.
- B. Shop Drawings: For each impact-resistant wall protection unit showing locations and extent. Include sections, details, and attachments to other work.
 - 1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below. Include Samples of accent strips to verify color selected.
 - 1. Wall and Corner Guards: 12 inches long. Include examples of joinery, corners, end caps, top caps, and field splices.
 - 2. Handrails: 12 inches long. Include examples of joinery, corners, and field splices.
 - 3. Impact-Resistant Wall Covering: 6 by 6 inches square.

1.4 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each impact-resistant plastic material, from manufacturer.

- B. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each impact-resistant wall protection unit to include in maintenance manuals.
1. Include recommended methods and frequency of maintenance for maintaining optimum condition of plastic covers under anticipated traffic and use conditions. Include precautions against using cleaning materials and methods that may be detrimental to plastic finishes and performance.

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. Wall-Guard and Handrail Covers: Full-size plastic covers of maximum length equal to 2 percent of each type, color, and texture of units installed, but no fewer than two, 8-foot-long units.
 2. Corner-Guard Covers: Full-size plastic covers of maximum length equal to 2 percent of each type, color, and texture of units installed, but no fewer than two, 4-foot-long units.
- B. Include mounting and accessory components. Replacement materials shall be from same production run as installed units.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Source Limitations: Obtain impact-resistant wall protection units from single source from single manufacturer.
- C. Product Options: Drawings indicate size, profiles, and dimensional requirements of impact-resistant wall protection units and are based on the specific system indicated.
1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- D. Surface-Burning Characteristics: Provide impact-resistant, plastic wall protection units with surface-burning characteristics as determined by testing identical products per ASTM E 84, NFPA 255, or UL 723 by UL or another qualified testing agency.
- E. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

- F. Preinstallation Conference: Conduct conference at Project site.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store impact-resistant wall protection units 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 plastic materials are stored.
 2. Keep plastic sheet material out of direct sunlight.
 3. Store plastic wall protection components for a minimum of 72 hours, or until plastic material attains a minimum room temperature of 70 deg F.
 - a. Store corner-guard covers in a vertical position.
 - b. Store wall-guard handrail covers in a horizontal position.

1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install impact-resistant wall protection units until building is enclosed and weatherproof, wet work is complete and dry, and HVAC system is operating and maintaining temperature at 70 deg F for not less than 72 hours before beginning installation and for the remainder of the construction period.

1.10 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of impact-resistant wall 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 plastic and other materials beyond normal use.
 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. PVC Plastic: ASTM D 1784, Class 1, textured, chemical- and stain-resistant, high-impact-resistant PVC or acrylic-modified vinyl plastic with integral color throughout; extruded and sheet material, thickness as indicated.

1. Impact Resistance: Minimum 25.4 ft-lbf/in. of notch when tested according to ASTM D 256, Test Method A.
 2. Self-extinguishing when tested according to ASTM D 635.
 3. Flame-Spread Index: 25 or less.
 4. Smoke-Developed Index: 450 or less.
- B. Aluminum Extrusions: Alloy and temper recommended by manufacturer for type of use and finish indicated, but with not less than strength and durability properties specified in ASTM B 221 for Alloy 6063-T5.
- C. Solid Wood: Clear hardwood lumber of species indicated, free of appearance defects, and selected for compatible grain and color.
- D. 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.

2.2 HANDRAILS

- A. Impact-Resistant Plastic Handrail (new and replacement cover): Assembly consisting of snap-on plastic cover installed over continuous retainer.
1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Balco, Inc.
 - b. Construction Specialties, Inc.
 - c. IPC Door and Wall Protection Systems; Division of InPro Corporation.
 2. Cover: Minimum 0.100-inch- thick, extruded rigid plastic; in dimensions and profiles indicated on Drawings.
 - a. Single Handrail: Cylindrical tube profile cover with continuous retainer and stainless steel corners, ends and brackets; with mounting brackets supporting bottom of rail.
 - b. Color and Texture: As indicated by manufacturer's designations.
 3. Mounting Bracket: Extended mounting on stainless steel mounting brackets.
 4. End Caps and Corners: Prefabricated, stainless steel; field adjustable for close alignment with snap-on cover.

2.3 CORNER GUARDS

- A. Surface-Mounted, Resilient, Plastic Corner Guards: Assembly consisting of snap-on plastic cover installed over continuous retainer; including mounting hardware; fabricated with 90- or 135-degree turn to match wall condition.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Balco, Inc.
 - b. Construction Specialties, Inc.
 - c. IPC Door and Wall Protection Systems; Division of InPro Corporation.
 2. Cover: Extruded rigid plastic, minimum 0.100-inch wall thickness; as follows:
 - a. Profile: Nominal 3-inch- long leg and 1/4-inch corner radius.
 - b. Height: 8 feet.
 - c. Color and Texture: As indicated by manufacturer's designations.
 3. Retainer: Minimum 0.060-inch- thick, one-piece, extruded aluminum.
 4. Retainer Clips: Manufacturer's standard impact-absorbing clips.
 5. Top and Bottom Caps: Prefabricated, injection-molded plastic; color matching cover; field adjustable for close alignment with snap-on cover.
- B. Surface-Mounted, Resilient, Vinyl Corner Guards: Extruded polyvinyl chloride, secured with double-sided tape; fabricated with 90- or 135-degree turn to match wall condition.
1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Balco, Inc.
 - b. Construction Specialties, Inc.
 - c. IPC Door and Wall Protection Systems; Division of InPro Corporation.
 2. Material: Rigid vinyl, minimum 0.080-inch wall thickness; as follows:
 - a. Profile: Nominal 1 1/2-inch- long leg.
 - b. Height: 8 feet.
 - c. Color and Texture: As indicated by manufacturer's designations.
 3. Mounting: Secure with manufacturer's double-faced foam tape.

2.4 END-WALL GUARDS

- A. Surface-Mounted, Resilient, Plastic End-Wall Guard: Assembly consisting of snap-on plastic cover installed over continuous retainer; including mounting hardware.
1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Balco, Inc.

- b. Construction Specialties, Inc.
 - c. IPC Door and Wall Protection Systems; Division of InPro Corporation.
- 2. Cover: Extruded rigid plastic, minimum 0.100-inch wall thickness; as follows:
 - a. Profile: Nominal 3-inch- long leg and 1/4-inch corner radius.
 - b. Height: 8 feet.
 - c. Color and Texture: As indicated by manufacturer's designations.
- 3. Retainer: Minimum 0.060-inch- thick, one-piece, extruded aluminum.
- 4. Top and Bottom Caps: Prefabricated, injection-molded plastic; color matching cover; field adjustable for close alignment with snap-on cover.

2.5 IMPACT-RESISTANT WALL COVERINGS

- A. Impact-Resistant Sheet Wall Covering: Fabricated from plastic sheet wall-covering material.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. Balco, Inc.
 - b. Construction Specialties, Inc.
 - c. IPC Door and Wall Protection Systems; Division of InPro Corporation.
 - 2. Size: 48 by 96 inches for sheet.
 - 3. Sheet Thickness: 0.060 inch.
 - 4. Color and Texture: As indicated by manufacturer's designations.
 - 5. Height: As indicated.
 - 6. Trim and Joint Moldings: Extruded rigid plastic that matches sheet wall covering color.
 - 7. Mounting: Adhesive.

2.6 FABRICATION

- A. Fabricate impact-resistant wall protection units to comply with requirements indicated for design, dimensions, and member sizes, including thicknesses of components.
- B. Assemble components in factory to greatest extent possible to minimize field assembly. Disassemble only as necessary for shipping and handling.
- C. Fabricate components with tight seams and joints with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.
- D. Miter corners and ends of wood handrails for returns.

2.7 METAL FINISHES

- A. Comply with NAAMM's "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 finish, free of cross scratches.
 - 3. Run grain of directional finishes with long dimension of each piece.
 - 4. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
- B. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

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 work.
- B. Examine walls to which impact-resistant wall 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 impact-resistant wall protection units attached with adhesive or foam tape, 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 impact-resistant wall protection system components.
- B. Before installation, clean substrate to remove dust, debris, and loose particles.

3.3 INSTALLATION

- A. General: Install impact-resistant wall protection units 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.
 - 1. Provide splices, mounting hardware, anchors, and other accessories required for a complete installation.

- a. Provide anchoring devices to withstand imposed loads.
 - b. Where splices occur in horizontal runs of more than 20 feet, splice aluminum retainers and plastic covers at different locations along the run, but no closer than 12 inches.
 - c. Adjust end and top caps as required to ensure tight seams.
- B. Impact-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 plastic 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 102600

SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Public-use washroom accessories.
 - 2. Private-use bathroom accessories.

1.2 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.

1.3 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.
- B. 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.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For accessories to include in maintenance manuals.

1.5 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: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 OWNER-FURNISHED MATERIALS

A. Owner-Furnished Contractor Installed Materials:

1. TA-3: Toilet Paper Dispenser
2. TA-9: Soap Dispenser
3. TA-12: Hand Sanitizer Dispenser
4. TA-13: Automatic Paper Towel Dispenser

2.2 PUBLIC-USE WASHROOM ACCESSORIES

A. Source Limitations: Obtain public-use washroom accessories from single source from single manufacturer.

B. Paper Towel (Folded) Dispenser TA-07:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Bobrick Washroom Equipment, Inc.; B-359033 or comparable product by one of the following:
 - a. American Specialties, Inc.; ASI Group.
 - b. Bobrick Washroom Equipment, Inc.
 - c. Bradley Corporation.
2. Mounting: Recessed.
3. Minimum Capacity: 300 C-fold or 400 multifold towels.
4. Material and Finish: Stainless steel, No. 4 finish (satin).
5. Lockset: Tumbler type.

C. Grab Bar TA-00, TA-01, TA-02 and TA-04:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Bobrick Washroom Equipment, Inc.; B-5806.99 or comparable product by one of the following:
 - a. American Specialties, Inc.; ASI Group.
 - b. Bobrick Washroom Equipment, Inc.
 - c. Bradley Corporation.
2. Mounting: Flanges with concealed fasteners.
3. Material: Stainless steel, 0.05 inch thick.
 - a. Finish: Smooth, No. 4 finish (satin) on ends and slip-resistant texture in grip area.
4. Outside Diameter: 1-1/4 inches.

5. Configuration and Length: As indicated on Drawings.

D. Mirror Unit TA-08:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Bobrick Washroom Equipment, Inc.; B-165 1836 or comparable product by one of the following:
 - a. American Specialties, Inc.; ASI Group.
 - b. Bobrick Washroom Equipment, Inc.
 - c. Bradley Corporation.
2. Frame: Stainless-steel channel.
 - a. Corners: Manufacturer's standard.
3. Hangers: Produce rigid, tamper- and theft-resistant installation, using method indicated below.
 - a. Wall bracket of galvanized steel, equipped with concealed locking devices requiring a special tool to remove.
4. Size: As indicated on Drawings.

E. Coat Hook TA-11:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Bobrick Washroom Equipment, Inc.; B-6827 or comparable product by one of the following:
 - a. American Specialties, Inc.; ASI Group.
 - b. Bobrick Washroom Equipment, Inc.
 - c. Bradley Corporation.
2. Description: Double -prong unit.
3. Material and Finish: Stainless steel, No. 4 finish (satin).

2.3 PRIVATE-USE BATHROOM ACCESSORIES

- A. Source Limitations: Obtain private-use bathroom accessories from single source from single manufacturer.

B. Soap Dish TA-05:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Bobrick Washroom Equipment, Inc.; B-6807 or comparable product by one of the following:
 - a. American Specialties, Inc.; ASI Group.
 - b. Bobrick Washroom Equipment, Inc.
2. Mounting: Surface mounted.
3. Material and Finish: Stainless steel, No. 4 finish (satin).

C. Medicine Cabinet TA-14:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Bobrick Washroom Equipment, Inc.; B-397 or comparable product by one of the following:
 - a. American Specialties, Inc.; ASI Group.
 - b. Bobrick Washroom Equipment, Inc.
2. Mounting: Recessed, for nominal 4-inch wall depth.
3. Size: 16 by 26 inches.
4. Door: Framed mirror door concealing storage cabinet equipped with continuous hinge and spring-buffered, rod-type stop and magnetic door catch.
5. Shelves: Three, adjustable.
6. Material and Finish: Match basis of design.

D. Towel Bar TA-10:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Bobrick Washroom Equipment, Inc.; B-6737 or comparable product by one of the following:
 - a. American Specialties, Inc.; ASI Group.
 - b. Bobrick Washroom Equipment, Inc.
2. Description: 3/4-inch- square tube with rectangular end brackets.
3. Mounting: Flanges with concealed fasteners.
4. Length: 18 inches.
5. Material and Finish: Stainless steel, No. 4 finish (satin).

E. Folding Shower Seat TA-15:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Bobrick Washroom Accessories; B-5191 or comparable product by one of the following:
 - a. American Specialties, Inc.; ASI Group.
 - b. Bradley Corporation.
2. Configuration: Rectangular seat.
3. Seat: Phenolic or polymeric composite of slat-type or one-piece construction in color as selected by Architect.
4. Mounting Mechanism: Stainless steel, No. 4 finish (satin).
5. Dimensions: 15 by 18 inches.

2.4 MATERIALS

- A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch minimum nominal thickness unless otherwise indicated.
- B. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.036-inch minimum nominal thickness.
- C. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 hot-dip zinc coating.
- D. Galvanized-Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- E. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.
- F. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

2.5 FABRICATION

- A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.
- B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

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.
- B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F 446.

3.2 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Remove temporary labels and protective coatings.
- C. Clean and polish exposed surfaces according to manufacturer's written instructions.

END OF SECTION 102800

SECTION 104313 - DEFIBRILLATOR CABINETS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Automated External Defibrillator (AED) cabinets.
 - 2. Accessories.

1.2 REFERENCES

- A. Reference Standards:
 - 1. American Heart Association (AHA):
 - a. American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care - current Edition.
 - 2. ASTM International (ASTM):
 - a. ASTM E814-11a, Standard Test Method for Fire Tests of Penetration Firestop Systems.
 - 3. International Code Council (ICC):
 - a. International Building Code (IBC).
 - 4. Intertek Testing Services/Warnock-Hersey International (ITS/WHI)
 - 5. National Fire Protection Association (NFPA):
 - a. NFPA 70-2011, National Electrical Code.
 - 6. Underwriters Laboratories, Inc. (UL)

1.3 ACTION SUBMITTALS

- A. Product Data:
 - 1. Cabinets: Materials description for defibrillator cabinets include roughing-in dimensions, details showing mounting methods, relationships to surrounding construction, door hardware, cabinet type and materials, trim style and door construction, door style and materials.
 - 2. Installation instructions for each product specified.
- B. Shop Drawings:
 - 1. Small-scale plans showing locations of defibrillator cabinets.
 - 2. Schedules showing each type of cabinet to ensure proper fit and function.

3. Indicate installation procedures and accessories required for a complete installation.

C. Samples:

1. Defibrillator Cabinet Door and Trim Finishes: For each type of exposed finish required, prepared on samples of size indicated below:
 - a. Size: 6 inches square.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and protect defibrillator cabinets and related materials using means and methods that will prevent damage, deterioration, or loss.
1. Deliver components in manufacturer's original packaging, properly labeled for identification.

PART 2 - PRODUCTS

2.1 DEFIBRILLATOR CABINET MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide products listed in following Articles by J. L. Industries, Inc. Other manufacturers offering comparable products include, but are not limited to, the following:
1. Defibtech.
 2. Phillips.
 3. HeartSine.
 4. HeartStation.
 5. Modern Metals.

2.2 PERFORMANCE REQUIREMENTS

- A. Single Source: Provide cabinets and accessories produced by a single manufacturer.
- B. Fire-Rated, Defibrillator Cabinets: Listed and labeled to comply with requirements in ASTM E814 for fire-resistance rating of walls where they are installed.

2.3 WALL-MOUNTED AED CABINETS

- A. Cabinet with Steel Trim and Door:
1. Basis-of-Design Product: 1400 Lifestart Series.
 2. Cabinet Style: Recessed and Semi-recessed.

3. Components:
 - a. Tub: Cold-rolled steel.
 - 1) Finish: Factory-applied powder coat paint finish; White.
 - b. Door and Trim Construction: Cold-rolled steel; flush doors with 5/8 inch door stop attached by continuous hinge and equipped with zinc-plated with roller catch.
 - 1) Finish: Factory-applied powder coat paint finish; white.
 - 2) Door Style:
 - a) Solid door; pull, and AED decal.
 - c. Trim Style and Depth:
 - 1) Recessed Cabinet: 3/8 inch flat trim.
 - 2) Semi-Recessed Cabinet:
 - a) Rolled Edge: 3 inch.
 - 3) Trim Dimensions: 1-3/4 inch face trim on door and frame.
4. Fire-Rating: Non-fire-rated, Fire-rated for 1-hour and 2-hour combustible and noncombustible wall systems.
5. Wall Signs and Cabinet Lettering:
 - a. AED wall signs.
 - b. Custom door graphics.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine walls and partitions for suitable framing depth and blocking where recessed and semi-recessed cabinets will be installed, and blocking where surface mounted cabinets will be installed.
 1. Notify the Contractor in writing of conditions detrimental to proper and timely completion of the installation.
 2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install cabinets in locations and at mounting heights indicated, or if not indicated, at heights to comply with applicable regulations of governing authorities.
 1. Prepare recesses in walls for defibrillator cabinets as required by type and size of cabinet and style of trim and to comply with manufacturer's instructions.

2. Securely fasten cabinets to structure, square and plumb, to comply with manufacturer's instructions.
 3. Maintain fire ratings where cabinets are recessed into fire-rated wall systems.
- B. Wall Signs:
1. Location: Where shown or directed.
 2. Apply on walls after field painting is completed and has been accepted.
- C. Cabinet Lettering:
1. Location: Face of door framing.
 2. Field-Painted Cabinets: Apply lettering after painting is complete and has been accepted.

3.3 ADJUSTING AND CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as defibrillator cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.
- B. Adjust cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.
- C. On completion of cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.
- D. Touch up marred finishes or replace cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by cabinet manufacturer.
- E. Replace cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 104313

SECTION 104413 - FIRE PROTECTION CABINETS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fire-protection cabinets for the following:
 - a. Portable fire extinguishers.
- B. Related Requirements:
 - 1. Section 104416 "Fire Extinguishers."

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product. 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.
- B. Shop Drawings: For fire-protection cabinets. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples: For each type of exposed finish required.
- D. Product Schedule: For fire-protection cabinets. Indicate whether recessed, semi-recessed, or surface mounted. Coordinate final fire-protection cabinet schedule with fire-extinguisher schedule to ensure proper fit and function. Use same designations indicated on Drawings.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For fire-protection cabinets to include in maintenance manuals.

1.4 COORDINATION

- A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.
- B. Coordinate sizes and locations of fire-protection cabinets with wall depths.

1.5 SEQUENCING

- A. Apply decals on field-painted fire-protection cabinets after painting is complete.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Fire-Protection Cabinets: Listed and labeled to comply with requirements in ASTM E 814 for fire-resistance rating of walls where they are installed.

2.2 FIRE-PROTECTION CABINET

- A. Cabinet Type: Suitable for fire extinguisher.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. JL Industries, Inc.; a division of the Activar Construction Products Group.
 - b. Kidde Residential and Commercial Division.
 - c. Larsens Manufacturing Company.
 - d. Nystrom, Inc.
 - e. Potter Roemer LLC.
- B. Cabinet Construction: Nonrated, 1-hour fire rated and 2-hour fire rated.
 - 1. Fire-Rated Cabinets: Construct fire-rated cabinets with double walls fabricated from 0.043-inch- thick cold-rolled steel sheet lined with minimum 5/8-inch- thick fire-barrier material. Provide factory-drilled mounting holes.
- C. Cabinet Material: Cold-rolled steel sheet.
- D. Recessed Cabinet:
 - 1. Exposed Flat Trim: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).
- E. Semi-recessed Cabinet: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).
 - 1. Rolled-Edge Trim: 2-1/2-inch backbend depth.
- F. Door Material: Steel sheet.
- G. Door Style: Solid opaque panel with frame.
- H. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.
 - 1. Provide recessed door pull and friction latch.
 - 2. Provide continuous hinge, of same material and finish as trim, permitting door to open 180 degrees.

I. Accessories:

1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire-protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.
2. Identification:
 - a. Identify fire extinguisher in fire-protection cabinet with the words "FIRE EXTINGUISHER."
 - 1) Location: Applied to cabinet door.
 - 2) Application Process: Decals.
 - 3) Lettering Color: Red.
 - 4) Orientation: Vertical.

J. Materials:

1. Cold-Rolled Steel: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.
 - a. Finish: Factory primed for field painting.
 - b. Color: Painted to match adjacent wall.

2.3 FABRICATION

- A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.
1. Weld joints and grind smooth.
 2. Provide factory-drilled mounting holes.
 3. Prepare doors and frames to receive locks.
 4. Install door locks at factory.
- B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles.
1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch thick.
 2. Fabricate door frames of one-piece construction with edges flanged.
 3. Miter and weld perimeter door frames.
- C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.4 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's AMP 500, "Metal Finishes Manual for Architectural and Metal Products," for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces of fire-protection cabinets from damage by applying a strippable, temporary protective covering before shipping.
- C. Finish fire-protection cabinets after assembly.
- 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 walls and partitions for suitable framing depth and blocking where recessed cabinets will be installed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare recesses for recessed fire-protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION

- A. General: Install fire-protection cabinets in locations and at mounting heights indicated or, if not indicated, at heights acceptable to authorities having jurisdiction.
- B. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.
 - 1. Unless otherwise indicated, provide recessed fire-protection cabinets. If wall thickness is inadequate for recessed cabinets, provide semi-recessed fire-protection cabinets.
 - 2. Provide inside latch and lock for break-glass panels.
 - 3. Fasten mounting brackets to inside surface of fire-protection cabinets, square and plumb.
- C. Identification: Apply decals at locations indicated.

3.4 ADJUSTING AND CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as fire-protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.
- B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.
- C. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.
- D. Touch up marred finishes or replace fire-protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire-protection cabinet and mounting bracket manufacturers.
- E. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 104413

SECTION 104416 - FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes portable, hand-carried fire extinguishers.
- B. Related Requirements:
 - 1. Section 104413 "Fire Protection Cabinets."

1.2 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.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher.

1.4 INFORMATIONAL SUBMITTALS

- A. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

1.6 COORDINATION

- A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

1.7 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 NFPA 10.
 - b. Faulty operation of valves or release levers.
 - 2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."
- B. 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 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

- A. Fire Extinguishers: Type, size, and capacity for each fire-protection cabinet indicated.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Larsen's Manufacturing Company; Model MP10 Fire Extinguisher.
 - b. JL Industries, Inc.; a division of the Activar Construction Products Group equivalent to Larsen's.
 - c. Kidde Residential and Commercial Division equivalent to Larsen's.
 - d. Larsens Manufacturing Company equivalent to Larsen's.
 - e. Nystrom, Inc. equivalent to Larsen's.
 - f. Potter Roemer LLC equivalent to Larsen's.
 - 2. Valves: Manufacturer's standard.
 - 3. Handles and Levers: Manufacturer's standard.
 - 4. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B, and bar coding for documenting fire-extinguisher location, inspections, maintenance, and recharging.
- B. Multipurpose Dry-Chemical Type in Steel Container: UL-rated 4-A:60-B:C, 10-lb nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fire extinguishers for proper charging and tagging.
 - 1. Remove and replace damaged, defective, or undercharged fire extinguishers.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

St. Louis Veteran's Home Renovation
St. Louis, MO
State Project No. U2307-01
CannonDesign Project No. 005680.00

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3.2 INSTALLATION

- A. General: Install fire extinguishers in locations indicated and in compliance with requirements of authorities having jurisdiction.

END OF SECTION 104416

SECTION 105126 - SOLID PHENOLIC LOCKERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Fully assembled solid phenolic core lockers.

1.2 REFERENCES

- A. ADA Standards for Accessible Design, and CBC Chapter 11B.

1.3 ACTION SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- B. 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.
- C. Samples: For each finish product specified, 2 complete sets of color chips.
- D. Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms to include in maintenance manuals.
- E. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

- A. Manufacturer
 - 1. Manufacturer shall have produced specified or similar products for a minimum of 5 years prior to bid, and have used products in similar scope, on projects of similar scale and type. Manufacturer shall have the capacity to produce and deliver products on schedule as required for the Work.
- B. Installing Contractor Qualifications:
 - 1. Installing contractor shall be certified, licensed, or otherwise approved by manufacturer as experienced and with sufficient trained staff to install manufacturer's products according to specified requirements.
 - 2. Installing contractor shall have installed specified or similar products on a minimum of 5 projects of similar scale and type within 5 years prior to bid.

3. Installing contractors superintendent shall have installed specified or similar products on a minimum of 5 projects of similar scale and type within 5 years prior to bid and have used specified products in a similar scope on projects of similar scale and type within past 12 months.
- C. Regulatory Requirements: Comply with the ADA Standards for Accessible Design and Chapter 11B, CBC.
- D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Quality Control."

1.5 DELIVERY, STORAGE & HANDLING

- A. Do not deliver lockers until spaces to receive them are clean, dry, and ready for their installation.
- B. Store products in manufacturer's unopened packaging until ready for installation.
- C. Protect locker finish and adjacent surfaces from damage.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of recessed openings by field measurements before fabrication.

1.7 COORDINATION

- A. Coordinate sizes and locations of bases for lockers.
- B. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of work specified in other Sections to ensure that lockers can be supported and installed as indicated.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal lockers that fail in materials or workmanship, excluding finish, within specified warranty period.
 1. Failures include, but are not limited to, the following:
 - a. Structural failures.
 - b. Faulty operation of latches and other door hardware.
 - c. Delamination or breakage of the plastic components.
 2. Damage from deliberate destruction and vandalism is excluded.
 3. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOLID PHENOLIC LOCKERS

- A. Manufacturer: Subject to compliance with requirements, provide the following product or an acceptable equal product:
 - 1. Summit Lockers (Basis of Design).
 - 2. ASI Storage Solutions.
 - 3. or equal.
- B. Series: Traditional Collection Z-Style.
- C. Phenolic Panel Material Characteristics:
 - 1. Manufacturer: Locker manufacturer's standard.
 - 2. Type: Decorative papers impregnated with the melamine resin on faces with a clear protective overcoat and integrally compression molded within a core consisting of solid phenolic impregnated kraft papers.
 - 3. Fire Resistance: Class B panel material per ASTM E84
 - 4. Colors:
 - a. Core: Black.
 - b. Facing: Color as designated on drawings.
- D. Locker Body.
 - 1. Exposed edges: Straight profile; eased edges to remove sharpness; machine polished and free from tooling imperfections.
 - 2. Tops, bottoms, and intermediate shelves: 1/2 inch thick solid phenolic composite material with ventilation holes.
 - 3. Locker backs: 1/4 inch thick solid phenolic composite material.
 - 4. Locker sides: 5/16 inch thick solid phenolic composite material.
- E. Doors:
 - 1. Material: 1/2 inch thick solid phenolic composite material.
 - 2. Corners: Rounded.
 - 3. Edges: Crescent profile; machine polished and free from tooling imperfections.
 - 4. Limit Arm: Provide stainless steel limit arm to allow maximum opening to 90 degrees.
 - 5. Door Fastening: Blind Fixing.

F. Ventilation:

1. Interior Vent: Provide six 3/8 inch diameter ventilation holes on tops, bottoms, and intermediate shelves. Provide three 3/8 inch diameter ventilation holes on Z-Type intermediary shelves.

G. Hardware:

1. Hinges:
 - a. Material: Powder coated steel.
 - b. Quantity: Three (3) for full height doors and two (2) for multi-tier units.
2. Interior hooks:
 - a. Material: Stainless Steel.
 - b. Top Hook: Two prong: one per opening for 1 Tier, 2 Tier, and Z-Type.
 - c. Side Hook: Single prong: two per opening for Z-Type.
3. Fasteners: Exposed fasteners shall be 304 stainless steel.
4. Fastener Application: Apply directly into or through the material.
5. Other Reinforcement: Aluminum or metal profiles for reinforcements shall not be permitted.
6. Door Identification (identification plates):
 - a. Fonts to be a minimum 1/2 inch high and up to four alphanumeric characters. Numbering sequence to be provided by architect.
 - b. Stainless Steel Plate manufacturer's standard size attached with permanent adhesive.
7. Locking System: Hasp preparation for padlock.
8. Handle: Trimco or equal, C style pull, 4 inch center to center, brushed stainless steel.

H. Design and Size:

1. Style: As indicated on drawings.
 - a. Locker top: As indicated on the drawings.
2. Size: As indicated on drawings.
3. Base: As indicated on drawings.

2.2 FABRICATION

- A. Fabricate locker components square and rigid, with finish free from scratches and chips.
- B. Ship lockers fully assembled, requiring only attachment of interior accessory items; lockers requiring assembly on site not acceptable.

- C. Separate solid phenolic components will be secured using perimeter dado routing to provide a continuous and solid joint that slides together for assembly.
- D. Locker Sides and Backs: One-piece unit constructed from single and contiguous sheet of solid plastic requiring no hardware. Door frames bonded to locker bodies using plastic welding process.
- E. Lockers With Doors.
 - 1. Latch: manufacturers standard assembly.
 - 2. Door Hinge: manufacturers standard assembly.
 - 3. Ventilation:
 - a. 6 horizontal slots in upper and lower ranges of door.

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 lockers at the location shown in accordance with the manufacturer's instructions for plumb, level, rigid and flush installations.
- B. Anchor the units to the wall studs or masonry through the locker back and to the floor. Lockers are joined side by side with non-corrosive tamper resistant fasteners.
- C. Install tops, filler panels and end panels fillers using concealed fasteners. Provide flush hairline joints against adjacent surfaces.
- D. Attach number plates using hardware provided by the manufacturer after the lockers are in place.

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.

3.4 PROTECTION

- A. Protect installed products until completion of project.

END OF SECTION 105126

SECTION 123530 - RESIDENTIAL CASEWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes kitchen and vanity cabinets.

1.2 DEFINITIONS

- A. MDF: Medium-density fiberboard.
- B. Exposed Surfaces of Cabinets: Surfaces visible when doors and drawers are closed, including visible surfaces in open cabinets or behind glass doors.
- C. Semiexposed Surfaces of Cabinets: Surfaces behind opaque doors or drawer fronts, including interior faces of doors, interiors and sides of drawers, and bottoms of wall cabinets.
- D. Concealed Surfaces of Cabinets: Surfaces not usually visible after installation, including sleepers, web frames, dust panels, bottoms of drawers, ends of cabinets installed directly against and completely concealed by walls or other cabinets, and tops of wall cabinets and utility cabinets.

1.3 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Cabinets.
 - 2. Cabinet hardware.
- B. Shop Drawings: Include plans, elevations, details, and attachments to other work. Show materials, finishes, filler panels, and hardware.
- C. Samples for Initial Selection: For cabinet finishes.
- D. Samples for Verification: 8-by-10-inch Samples for each type of finish and the following:
 - 1. Exposed hardware, for each type of item.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For manufacturer.
- B. Product Certificates: For casework.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install casework until building is enclosed, wet work is complete and dry, and temporary HVAC system is operating and maintaining temperature and humidity conditions at occupancy levels during the remainder of the construction period.

- B. Established Dimensions: Where casework is indicated to fit to other construction, establish dimensions for areas where casework is to fit. Coordinate construction to ensure that actual dimensions correspond to established dimensions. Provide fillers and scribes to allow for trimming and fitting.
- C. Field Measurements: Where casework is indicated to fit to existing construction, verify dimensions of existing construction by field measurements before fabrication and indicate measurements on Shop Drawings. Provide fillers and scribes to allow for trimming and fitting.

1.6 COORDINATION

- A. Coordinate layout and installation of blocking and reinforcement in partitions for support of casework.

PART 2 - PRODUCTS

2.1 CABINETS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings is by Echelon, or comparable product by one of the following:
 - 1. Bertch Cabinet Mfg., Inc.
 - 2. Echelon (formerly Armstrong Cabinet)
 - 3. Haas Cabinet Co., Inc.
 - 4. KraftMaid Cabinetry, Inc.
- B. Quality Standard: Provide cabinets that comply with KCMA A161.1.
 - 1. KCMA Certification: Provide cabinets with KCMA's "Certified Cabinet" seal affixed in a semiexposed location of each unit and showing compliance with the above standard.
- C. Face Style: Flush overlay; door and drawer faces cover cabinet fronts with only enough space between faces for operating clearance.
- D. Cabinet Style: Face frame.
- E. Door and Drawer Fronts: Solid-wood stiles and rails, 5/8 inchthick, with 3/4-inch-thick, solid-wood center panels.
- F. Face Frames: 3/4-by-1-5/8-inchsolid wood with glued mortise and tenon or doweled joints.
- G. Exposed Cabinet End Finish: Wood veneer.
- H. Cabinet End Construction: 3/8-inch- thick plywood.

- I. Cabinet Tops and Bottoms: 3/8-inch- thick plywood, fully supported by and secured in rabbets in end panels, front frame, and back rail.
- J. Back, Top, and Bottom Rails: 3/4-by-2-1/2-inch solid wood, interlocking with end panels and rabbeted to receive top and bottom panels. Back rails secured under pressure with glue and with mechanical fasteners.
- K. Wall-Hung-Unit Back Panels: 3/16-inch-thick plywood fastened to rear edge of end panels and to top and bottom rails.
- L. Base-Unit Back Panels: 3/16-inch-thick plywood fastened to rear edge of end panels and to top and bottom rails.
- M. Front Frame Drawer Rails: 3/4-by-1-1/4-inch solid wood mortised and fastened into face frame.
- N. Drawers: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.
 - 1. Join subfronts, backs, and sides with glued rabbeted joints supplemented by mechanical fasteners or glued dovetail joints.
 - 2. Subfronts, Backs, and Sides: 1/2-inch- thick solid wood.
 - 3. Bottoms: 1/4-inch- thick plywood.
- O. Shelves: thick particleboard or 5/8-inch- thick plywood.
- P. Joinery: Rabbet backs flush into end panels and secure with concealed mechanical fasteners. Connect tops and bottoms of wall cabinets and bottoms and stretchers of base cabinets to ends and dividers with mechanical fasteners. Rabbet tops, bottoms, and backs into end panels.
- Q. Factory Finishing: Finish cabinets at factory. Defer only final touchup until after installation.

2.2 CABINET MATERIALS

- A. Hardwood Lumber: Kiln dried to 7 percent moisture content.
- B. Softwood Lumber: Kiln dried to 10 percent moisture content.
- C. Hardwood Plywood: HPVA HP-1.
- D. Exposed Materials:
 - 1. Exposed Wood Species: Maple.
 - a. Select materials for compatible color and grain. Do not use two adjacent exposed surfaces that are noticeably dissimilar in color, grain, figure, or natural character markings.
 - b. Staining and Finish: As selected by Architect from manufacturer's full range.

2. Solid Wood: Clear hardwood lumber of species indicated, free of defects.
 3. Plywood: Hardwood plywood with face veneer of species indicated, with Grade A faces and Grade C backs of same species as faces.
 - a. Edge band exposed edges with a minimum of 1/8-inch-thick, solid-wood edging of same species as face veneer.
 4. Provide manufacturer's standard crown mold 2-4 inches at wall cabinets. Provide matching flat panels above wall cabinets to ceiling.
- E. Semiexposed Materials: Unless otherwise indicated, provide the following:
1. Solid Wood: Sound hardwood lumber, selected to eliminate appearance defects. Same species as exposed surfaces or stained to be compatible with exposed surfaces.
 2. Plywood: Hardwood plywood with Grade C faces and not less than Grade 3 backs of same species as faces. Face veneers of same species as exposed surfaces or stained to be compatible with exposed surfaces.
- F. Concealed Materials: Solid wood or plywood, of any hardwood or softwood species, with no defects affecting strength or utility; particleboard; MDF; or hardboard.

2.3 CABINET HARDWARE

- A. General: Manufacturer's standard units complying with BHMA A156.9, of type, size, style, material, and finish as selected by Architect from manufacturer's full range.
- B. Pulls: Surface-mounted decorative pulls.
- C. Hinges: Decorative full-surface hinges.
- D. Drawer Guides: Epoxy-coated-metal, self-closing drawer guides; designed to prevent rebound when drawers are closed; with nylon-tired, ball-bearing rollers; and complying with BHMA A156.9, Type B05011 or Type B05091.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of framing and reinforcements, and other conditions affecting performance of casework.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install cabinets with no variations in flushness of adjoining surfaces; use concealed shims. Where cabinets abut other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips, and moldings in finish to match cabinet face.

- B. Install cabinets without distortion so doors and drawers fit the openings, are aligned, and are uniformly spaced. Complete installation of hardware and accessories as indicated.
- C. Install cabinets level and plumb to a tolerance of 1/8 inch in 8 feet
- D. Fasten cabinets to adjacent units and to backing.
 - 1. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches o.c. with No. 10 wafer-head screws sized for not less than 1-1/2-inch penetration into wood framing, blocking, or hanging strips.

3.3 ADJUSTING AND CLEANING

- A. Adjust cabinets and hardware so doors and drawers are centered in openings and operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.
- B. Clean casework on exposed and semiexposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

END OF SECTION 1235