



Marathon County Public Library

Restroom Renovation

300 North First Street
Wausau, WI 54403



404 N. Main Street, Suite 601
Oshkosh, WI 54901
920.267.3600
www.martin-riley.com

July 15, 2025

**SECTION 00 0105
CERTIFICATIONS PAGE**

PROJECT:

**MARATHON COUNTY PUBLIC LIBRARY
RESTROOM RENOVATIONS
300 NORTH FIRST STREET
WAUSAU, WI 54403**

OWNER:

**MARATHON COUNTY
300 1ST STREET
WAUSAU, WI 54403**

ARCHITECT / ENGINEER:

**MARTINRILEY ARCHITECTS|ENGINEERS
404 N. MAIN STREET, SUITE 601
OSHKOSH, WI 54901
PHONE: 920.267.3600
WWW.MARTIN-RILEY.COM**

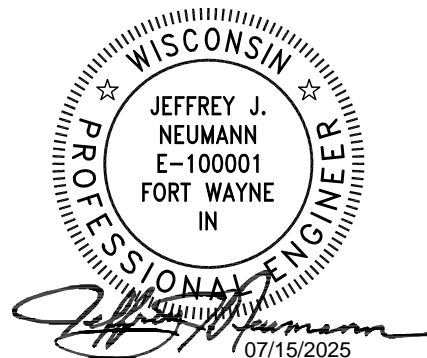
COMMISSION NUMBER: O25037

DATE OF ISSUE: JULY 15, 2025

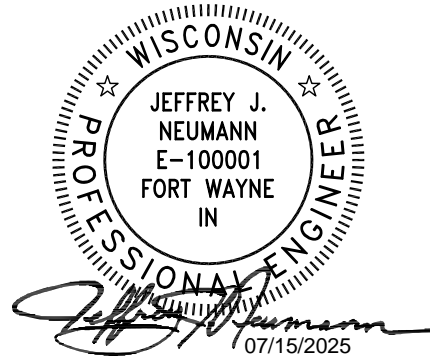


**CERTIFIED BY: NATE HEUSS, AIA
MARTINRILEY ARCHITECTS|ENGINEERS**

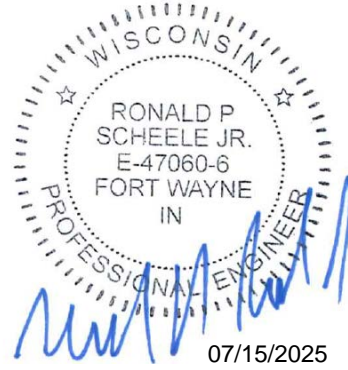
**PLUMBING CERTIFIED BY: JEFF NEUMANN, PE
MARTINRILEY ARCHITECTS|ENGINEERS**



**MECHANICAL CERTIFIED BY: JEFF NEUMANN, PE
MARTINRILEY ARCHITECTS|ENGINEERS**



**ELECTRICAL CERTIFIED BY: RON SCHEELE, PE
MARTINRILEY ARCHITECTS|ENGINEERS**



END OF CERTIFICATIONS PAGE

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END OF SECTION 00 0110

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**SECTION 00 1113
ADVERTISEMENT FOR BIDS**

FROM:**1.01 THE OWNER (HEREINAFTER REFERRED TO AS OWNER):**

Marathon County Facilities and Capital Management Department
1000 Lakeview Drive, Suite 300 (Door 35)
Wausau, WI 54403
C/O: Craig Christians

1.02 PROJECT LOCATION

Project Location Address 2
County of Marathon Public Library
300 First Street
Wausau, WI 54403

1.03 AND THE ARCHITECT (HEREINAFTER REFERRED TO AS ARCHITECT):

Martin-Riley architects &engineers
404 N. Main Street, Suite 601
Oshkosh, WI 54901

1.04 DATE: JULY 15, 2025**1.05 TO: POTENTIAL BIDDERS**

- A. This Request for Proposal has been established to inform, and solicit, qualified contractors of a partial alteration and renovation project for the Marathon County Public Library.
- B. Your firm is invited to submit an offer under seal to the Owner, Marathon County Facilities and Capital Management Department, for this project.
- C. This shall be a single lump sum bid contract; with a substantial completion date of Decembver 15, 2025.
- D. The size of said project affects approximately 2,400 s.f. As part of the work; the stacked restrooms on each floor (4 such) will be renovated. Likewise, the family restrooms on the first floor will be renovated. In addition, an existing open area will be subdivided into smaller private study rooms.
- E. Interested parties may obtain a copy of the Request for Bid from the Facilities and Capital Management Department, 1000 Lakeview Drive, Suite 300 Wausau, WI 54403, or on the Marathon County website at **www.marathoncounty.gov**
- F. A **Mandatory** Pre Bid Meeting has been set at the project site, Marathon County Public Library, 300 First Street, Wausau, WI 54403, at 9:00 A.M. on the, 1st of August, 2025.
- G. All bids shall be sealed and delivered to the, Marathon County Facilities and Capital Management Department: c/o Craig Christians, at the above listed Owner address. The sealed Proposal envelope shall bear the name and address of the bidding contractor, as well as, the Project Title nomenclature: "**O25037 Marathon County Public Library - Restroom Renovations**"
- H. All bids must be received in writing (faxed or electronic submissions will not be accepted) by the Marathon County Facilities and Capital Management Department at 1000 Lakeview Drive, Suite 300 Wausau, WI 54403, no later than 2:00 P.M. on August 14, 2025. Date/ time stamp is encouraged to assure the Bid has been properly accepted by the Bid due date/ time. No late Bid will be accepted. Simply depositing in the mail by the bid date is insufficient.

- I. Bids shall remain firm once submitted and may not be withdrawn for a period of 90 days, subject to the provisions for correction of error in the proposal in section 3.05 (1)g) of the procurement code.

1.06 SECURITY DEPOSIT:

- A. Bids shall be accompanied with a security deposit in the form of a Bid Bond or certified check in the amount of no less than 10% of the Bid Sum. Endorsement of the Bid Bond or Certified Check shall be in the name of the owner as obligee, signed and sealed by the Contractor as the principal and the Surety.
- B. After a Bid has been accepted, all other securities shall be returned to their respective Bidders. For the accepted Bidder, the security deposit will be returned after execution of the Contract. If not contract is awarded, all security deposits will be returned. Include the cost of the Bid security in the Bid Sum.
- C. Marathon County reserves the right to reject, in whole or in part, and and all bis; to waive any technical deficiencies in the bids; to accept the bid and award final contract to the responsible offeror determined to be the most advantageous to Marathon County. The contract shall be awarded in accordance with the terms and conditions of section 3.05 (2) (g) of the procurement code. This solicitation may be canceled if doing so is determined to be in the best interest of Marathon County. Upon award of the contract, all submitted documents become subject to the Open Records Law of the State of Wisconsin.
- D. The General Code of the County of Marathon contains various procurement policies which are applicable to this proposed procurement. These include prohibitions against gratuities and kickbacks. See also Marathon County Standard Terms and Conditions in the Specifications.
By: Craig Christians, Facilities Planner
Facilities and Capital Management Department
- E. Refer to other bidding requirements described in Document 00 2113 - Instructions to Bidders
- F. Submit your offer on the Bid Form provided. Bidders may supplement this form as appropriate.

1.07 SIGNATURE

- A. For: Marathon County
- B. By: _____
 - 1. Signed: _____
 - 2. (Authorized signing officer)

ENCL.

END OF SECTION 00 1113

**SECTION 00 2100
INSTRUCTIONS TO BIDDERS**

PART 1 FORM OF GENERAL CONDITIONS

1.01 THE INSTRUCTIONS TO BIDDERS APPLICABLE TO THIS CONTRACT ARE INCORPORATED INTO THE PROJECT MANUAL BY REFERENCE, AND ARE A PART OF THE DOCUMENTS AS MUCH AS IF THEY HAD BEEN REPRINTED IN THEIR ENTIRETY.

- A. AIA Document A701 - 1997, "Instructions to Bidders", Articles 1 through 8, as published by The American Institute of Architects, 1735 New York Avenue, N.W., Washington, D.C. 20006 are hereby, except as may be inconsistent herewith, made part of these Contract Documents.
- B. Copies of the Instructions to Bidders, AIA Document A701 1997, are available upon request from the Architect.

1.02 RELATED REQUIREMENTS

- A. Section 00 2213 - Supplementary Instructions to Bidders.

PART 2 SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

2.01 REFER TO DOCUMENT 00 2213 FOR AMENDMENTS TO THESE INSTRUCTIONS TO BIDDERS

END OF SECTION 00 2100

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**SECTION 00 2213
SUPPLEMENTARY INSTRUCTIONS TO BIDDERS**

GENERAL

1.01 AIA DOCUMENT A701, "INSTRUCTIONS TO BIDDERS - CURRENT EDITION", ARTICLES 1 THROUGH 8, AS PUBLISHED BY THE AMERICAN INSTITUTE OF ARCHITECTS, 1735 NEW YORK AVENUE, N.W., WASHINGTON, D.C. 20006 ARE HEREBY, EXCEPT AS MAY BE INCONSISTENT HERewith, MADE PART OF THESE BIDDING DOCUMENTS. THESE INSTRUCTIONS TO BIDDERS APPLY EQUALLY TO AND ARE PART OF ALL BIDDING DOCUMENTS BETWEEN THE OWNER AND EACH SEPARATE CONTRACTOR FOR THE WORK UNDER THIS PROJECT.

SUPPLEMENTARY INSTRUCTIONS TO BIDDERS:

2.01 THE FOLLOWING SUPPLEMENTS MODIFY, CHANGE, DELETE FROM OR ADD TO THE "INSTRUCTIONS TO BIDDERS - CURRENT EDITION", AIA DOCUMENT A701. WHERE ANY ARTICLE OF THE INSTRUCTIONS TO BIDDERS IS MODIFIED OR ANY PARAGRAPH, SUBPARAGRAPH OR CLAUSE THEREOF IS MODIFIED OR DELETED BY THESE SUPPLEMENTS, THE UNALTERED PROVISIONS OF THAT ARTICLE, PARAGRAPH, SUBPARAGRAPH, OR CLAUSE SHALL REMAIN IN EFFECT.

ARTICLE 1 DEFINITIONS**3.01 1.6, REVISE THE PARAGRAPH TO READ AS FOLLOWS:**

- A. 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted. Alternates are identified in the Contract Documents.

3.02 1.6.1, ADD THE FOLLOWING NEW SUBPARAGRAPH:

- A. 1.6.1 A Voluntary Alternate Bid (or Voluntary Alternate) is an amount proposed by the Bidder as alternative materials, products, or equipment not described in the Bidding Documents or otherwise approved as a substitution as identified under paragraph 3.3 Substitutions. Bids proposed in this manner are to be clearly identified as amounts to be added to, deducted from, or in lieu of the Base Bid or Alternate Bids described in the Bidding Documents. Voluntary Alternates shall be subject to the criteria of paragraph 3.3. Substitutions, before it will be considered or accepted. The Architect's decision of acceptance or non-acceptance of a proposed Voluntary Alternate shall be final.

3.03 1.11, ADD THE FOLLOWING PARAGRAPH:

- A. 1.11 The Architect is:
1. MartinRiley architects|engineers
404 N. Main Street, Oshkosh, WI 54901
Phone: (920) 267-3600

ARTICLE 2 BIDDER'S REPRESENTATIONS**4.01 2.1.5, ADD THE FOLLOWING PARAGRAPH:**

- A. 2.1.5 No Bidder, after the award of the Contract, shall be allowed any extra compensation for reasons of their failure to inform themselves fully, prior to bidding, of all requirements of the Contract Documents, drawings, specifications and circumstances of the building site.

4.02 2.1.6, ADD THE FOLLOWING PARAGRAPH:

- A. 2.1.6 Bidders represent that at the time Bids are submitted for consideration, they have no questions regarding ambiguity or omissions and are submitting Bids that will result in a complete project.

ARTICLE 3 BIDDING DOCUMENTS**5.01 3.1.1.1, ADD THE FOLLOWING SUBPARAGRAPH:**

- 3.1.1.1. Bidding Documents - See Marathon County Advertisement for Bids.

5.02 3.2.1.1, ADD THE FOLLOWING SUBPARAGRAPH:

- A. 3.2.1.1 In the event of an inconsistency between the Drawings and the Specifications or within either Document that is not clarified by addenda, the better quality or greater quantity of Work shall be provided in accordance with the Architect's interpretation.

5.03 3.2.4, ADD THE FOLLOWING NEW SUBPARAGRAPH:

- A. 3.2.4 Questions for this project shall be directed to:
Project Manager: Mr. Natt Heuss
Phone: (920) 267-3600
email: nheusss@martin-riley.com

5.04 3.3.1.1, ADD THE FOLLOWING SUBPARAGRAPH:

- A. 3.3.1.1 Where specific materials, trade names, or models of certain manufacturers are specified, it is done to establish a basis of durability, efficiency, appearance and simplification of maintenance, and not for the purpose of limiting competition. If a bidder wishes to use a different product in the bid to be submitted, then that product must be submitted for approval following the submittal procedures defined elsewhere within this specification. The decision of the Architect and Owner shall be final.

5.05 3.3.2, ADD THE FOLLOWING AFTER "ARCHITECT'S" IN THE LAST LINE:

- A. "...and Owner's..."

ARTICLE 4 BIDDING PROCEDURES

6.01 4.1.1.1, ADD THE FOLLOWING CLAUSE:

- A. 4.1.1.1 Bids shall also be accompanied by the following completed documents as well as those listed on the Bid Form in order for the Bid to be valid:
 1. 10% Bid Deposit

6.02 4.1.2.1, ADD THE FOLLOWING SUBPARAGRAPH:

- A. 4.1.2.1 Failure to bid requested alternates, unit prices or fill in any blanks will be considered justification for rejection of the bid.

6.03 4.1.8, ADD THE FOLLOWING NEW PARAGRAPH:

- A. 4.1.8 Proposals will be "STIPULATED SUM" for the projects as listed in Division 1, GENERAL REQUIREMENTS and in the Proposal Form Supplement.

4.2.1, DELETE THE FIRST TWO SENTENCES AND ADD THE FOLLOWING TWO NEW SENTENCES:

- A. Each bid shall be accompanied by either a bid bond or a certified check drawn in favor of Marathon County for an amount not less than five percent (10%) of the maximum bid or bids submitted. The bid bond pledges that the Bidder will enter into a Contract with the Owner on the terms stated in the Bid and will, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder.

6.04 4.3.5, ADD THE FOLLOWING NEW SUBPARAGRAPH:

- A. 4.3.5 Deliver copies of the bid and any other documents required in duplicate on or before the time and at the location specified.

ARTICLE 5 CONSIDERATION OF BIDS

7.01 5.1, ADD THE FOLLOWING SENTENCE:

- A. Bids will be opened by the Owner immediately after the specified time for submission.

7.02 5.1.2, ADD THE FOLLOWING PARAGRAPH

- A. 5.1.2 The Owner reserves the right to waive any and all formalities.

7.03 5.2, MODIFY THE FIRST SENTENCE TO READ:

- A. The Owner reserves the right to reject any or all Bids and is not obligated to accept the lowest or any combination of Bids.

7.04 5.3.1, ADD THE FOLLOWING SENTENCE TO THE END OF THE PARAGRAPH:

- A.Notice of acceptance or rejection of Bids by the Owner shall be given within 60 days of the receipt of Bids.

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

8.01 7.1.1, MODIFY THE FIRST SENTENCE TO READ:

- A. 7.1.1 The Bidder shall furnish bonds, i.e, Performance Bond and Payment Bond covering the faithful performance of the Contract and payment of all obligations arising thereunder, in an amount specified in the General and Supplementary Conditions of the Contract.

ARTICLE 9 TIME

9.01 9.1 ADD NEW PARAGRAPH AND SUBPARAGRAPH:

- A. 9.1 COMPLETION TIME
 - 1. 9.1.1 It is the intent of the Owner to have work begin on or after August 18, 2025 and have work substantially complete and suitable for use before or on November 14, 2025.

ARTICLE 10 MEETINGS

10.01 10.1, ADD NEW PARAGRAPH AND SUBPARAGRAPH:

- A. 10.1 PREBID CONFERENCE:
 - 1. 10.1.1 A prebid conference with the Owner, Architect, and Bidders will be held at 9:00 am local time, on the 1st of July, 2025, at the Project Site.

RELATED DOCUMENTS

11.01 DOCUMENT 00 4100 - BID FORM.

11.02 DOCUMENT 00 4336 - PROPOSED SUBCONTRACTORS FORM.

11.03 DOCUMENT 00801 - SUPPLEMENTARY CONDITIONS:

- A. Contract Time identification.
- B. Tax and duty rebate procedures.
- C. Tax exempt procedures.
- D. Bond types and values.

END OF SECTION 00 2213

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**SECTION 00 3100
AVAILABLE PROJECT INFORMATION**

PART 1 GENERAL

1.01 EXISTING CONDITIONS

- A. Certain information relating to existing surface and subsurface conditions and structures is available to bidders but will not be part of Contract Documents, as follows:
- B. Hazardous Material Survey: Entitled Limited Asbestos & Lead Paint Testing, 300 1st Street Wausau WI 54403, dated June 17, 2025.
 - 1. A copy of this report is appended to the end of this Section 00 3100.

END OF SECTION 00 3100



Corporate Office:
1006 Western Avenue
Mosinee, WI 54455
Tel: 715.693.6112
info@NorthStarTesting.com

Fox Cities Branch:
1907 American Drive
Suite A3
Neenah, WI 54956
Tel: 920.422.4888

Madison Branch:
1320 Mendota Street
Suite 120
Madison, WI 53714
Tel: 608.827.6761

Sheboygan Branch:
2109 Erie Avenue
Suite 103
Sheboygan, WI 53081
Tel: 920.422.4888

Asbestos • Lead Paint • Mold • Indoor Air Quality • Industrial Hygiene

June 17, 2025

Marathon County Facilities
c/o Craig Christians
1000 Lakeview Drive, Suite 300
Wausau, WI 54403

Project:	Limited Asbestos & Lead Paint Testing
Site:	Marathon County Library 300 1st Street Wausau, WI 54403
Work Area:	All Levels: Bathrooms
Site Date:	June 11, 2025
NorthStar No.	250-800

NorthStar Environmental Testing, LLC (NorthStar) was authorized by Craig Christians on behalf of Marathon County Facilities to perform limited asbestos & lead-based paint testing prior to renovations for the following site:

SITE SUMMARY:

Testing Date:	June 11, 2025	Work Area:	Bathrooms
Building/Site:	300 1st Street Wausau, WI 54403	Contact:	Craig Christians Phone: 715.581.9595
Building Type:	Commercial Library	Construction Date:	Pre-1978
Materials Tested:	Floors, Walls	Regulatory Limit:	Asbestos: >1% Lead Paint: 1.0 mg/cm ² OSHA: any amount
Asbestos Materials:	None		
Lead-Based Paint:	No lead-based paint was identified on surfaces tested.	Visual Assessment:	No deteriorated lead-based paint was identified.
Sampling Technician:	Andrew Schilling	Certification Number:	All-213175/ LRA-213175
Asbestos / Lead Company:	DHS-925800 Expiration Date: 08/01/2025		
Lead Testing Equipment:	Viken Pb200e, Serial Number: 1122		
Comment:	The testing was performed at the direction of our client. Other areas or surfaces throughout the applicable area should be assumed to contain lead and/or asbestos unless additional testing proves otherwise. All bathrooms appeared homogenous with the same building materials and date of application and have been remodeled within the last 30 years. Sampling was performed in such a manner.		

ASBESTOS SAMPLE RESULTS:

Sample ID	Bldg. Level	Material Location	Material Sample	Description	Asbestos Content
800-1	B	Basement Bathroom On Ceramic	Door Caulk	White	None Detected
800-2	B	Basement Bathroom Wall on Drywall	4" Ceramic Tile Adhesive	Tan	None Detected
800-3	B	Basement Bathroom Wall on Drywall	4" Ceramic Tile Grout	White	None Detected
800-4	B	Basement Bathroom	2x4 Sheetrock Ceiling Tile	White	None Detected
800-5	B	Basement Bathroom Floor on Concrete	2" Ceramic Tile Mortar	White	None Detected
800-6	B	Basement Bathroom Floor on Concrete	2" Ceramic Tile Grout	Brown	None Detected
800-7	1	1st Floor Bathroom Entry	2x4 Pinhole Crater Ceiling Tile	Grey	None Detected
800-8	1	1st Floor Bathroom Entry Wall	Drywall	White	None Detected
800-9	1	1st Floor Bathroom Entry Wall	Joint Compound	White	None Detected
800-10	1	1st Floor Bathroom Wall	Wall Insulation	Cream	None Detected
800-11	1	1st Floor Bathroom Behind Ceramic Wall	Drywall Backing	White	None Detected
800-12	1	1st Floor Bathroom On Ceramic	Door Caulk	White	None Detected
800-13	2	2nd Floor Bathroom On Beam	Fireproofing Insulation	Grey	None Detected
800-14	2	2nd Floor Bathroom On Beam	Fireproofing Insulation	Grey	None Detected
800-15	2	2nd Floor Bathroom On Beam	Fireproofing Insulation	Grey	None Detected
800-16	3	3rd Floor Bathroom Wall on Drywall	4" Ceramic Tile Adhesive	Tan	None Detected
800-17	3	3rd Floor Bathroom Wall on Drywall	4" Ceramic Tile Grout	White	None Detected
800-18	3	3rd Floor Bathroom Floor on Concrete	2" Ceramic Adhesive	Cream	None Detected
800-19 Layer 1	3	3rd Floor Bathroom Floor on Concrete	2" Ceramic Mortar	Grey	None Detected
800-19 Layer 2	3	3rd Floor Bathroom Floor on Concrete	2" Ceramic Tile Grout	Brown	None Detected
800-20	3	3rd Floor Bathroom	2x4 Sheetrock Ceiling Tile	White	None Detected
800-21	3	3rd Floor Bathroom Wall	Concrete Backing Board	Grey	None Detected

Samples with a confirmed analysis of greater than one percent (>1%) are to be considered an asbestos containing material (ACM) requiring special handling and disposal measures. OSHA regulations still apply to materials with less than or equal to one percent (≤1%) asbestos.

Laboratory:	Eurofins NVLAP# 101768-0
Analysis Date:	June 16, 2025 (reported)

Bulk sample analysis by polarized light microscopy with dispersion staining; USEPA method: EPA 600/M4-82/020 & EPA 600/R-93/116 (where applicable); Reported percentages are visually estimated by volume. Unless otherwise requested by client, each material or layer of a non-homogeneous sample is analyzed separately with reported percentages based on total sample. This report is not to be used to claim product endorsement by NVLAP or any other U.S. Government agency.

LEAD-BASED PAINT TESTING RESULTS:

Testing for lead-based paint analyzes all layers of paint on a particular surface area simultaneously. The testing does not specifically identify which layer or color of paint contains lead. A positive testing location entails that some layer of paint on that particular surface contains lead in paint in excess or equal to 1.0 mg/cm².

Reading No	Wall	Structure	Location	Member	Paint Condition	Substrate	Color	Lead (mg/cm2)
Pre-Calibration								
1								1
2								0.9
3								1
4								0.1
3 rd Floor Men's Restroom								
5	East	Wall			Intact	Ceramic	White	0.1
6	West	Wall			Intact	Ceramic	White	0
7	West	Floor			Intact	Ceramic	Tan	0
3 rd Floor Women's Restroom								
9	North	Wall			Intact	Ceramic	White	0.1
10	South	Wall			Intact	Ceramic	White	0.1
11	South	Floor			Intact	Ceramic	Tan	0.1
2 nd Floor Men's Restroom								
12	North	Wall			Intact	Ceramic	White	0.2
13	South	Wall			Intact	Ceramic	White	0.1
14	South	Floor			Intact	Ceramic	Tan	0.4
1 st Floor Men's Restroom								
15	East	Wall			Intact	Ceramic	White	0
16	West	Wall			Intact	Ceramic	White	0.1
17	West	Floor			Intact	Ceramic	Tan	0.2
1 st Floor Restroom Entry								
18	North	Wall			Intact	Drywall	Tan	0.1
19	West	Wall			Intact	Drywall	Tan	0.1
Post-Calibration								
20								1.1
21								1
22								1
23								0

Abbreviations:	U = Upper	L = Lower	Rgt = Right	Lft = Left	Ctr = Center	Bsmt = Basement
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Notes:

- All similar materials with the same paint history are to be categorized in the same manner.
- Additional areas of lead-based paint are possible in inaccessible areas, areas hidden from view or materials/substrates contained behind or within other building materials.
- The calibration of the XRF analyzer was verified before and after testing by taking three readings from a source known to contain 1.02 mg/cm² lead (NIST Standard Reference Material). The three positive calibration readings were followed by a sample on bare wood containing no LBP.

Methodology:

The EPA and HUD defines LBP as equal to or greater than 1.0 mg/cm² measured by X-ray fluorescence (XRF) analysis, or 0.5% (5000 ppm) measured by weight through laboratory analysis. The State of Wisconsin has adopted the same definition of lead-based paint (primarily for residential HUD applications and for building demolition/disposal).

Our non-destructive testing by XRF has been performed in an attempt to screen for areas with quantifiable lead above regulatory limits on painted substrates. The reportable limit of detection is essentially 1.0 mg/cm² by XRF analysis and therefore paint chip analysis would be recommended for a more accurate determination of lead in paint below this level or to rule out lead in any quantifiable amount.

For worker exposure applications, lead in any quantifiable amount, and disturbance of the material creating dust and/or fumes and subsequent potential worker exposure would be regulated by the OSHA Lead in Construction Standard (29 CFR 1926.62).

REMARKS:

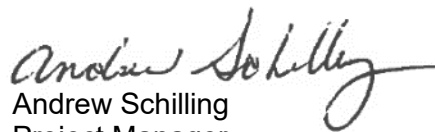
The testing and subsequent report have been performed according to applicable regulations and generally accepted industry standards and practices in this locality under similar conditions. Information provided to us by the building owner/occupant, client or other interested party that may have been utilized in the performance and reporting of the survey was accepted in good faith and can only be assumed to be accurate. The findings and recommendations made are representative of our professional opinion based on currently available information; no other warranty is implied or intended.

Please contact us if you have any questions regarding the presented information or the project in general.

Sincerely,
NorthStar Environmental Testing, LLC.



Dave Barrett
Operations Manager



Andrew Schilling
Project Manager

attach: Site Photos

Site Photos



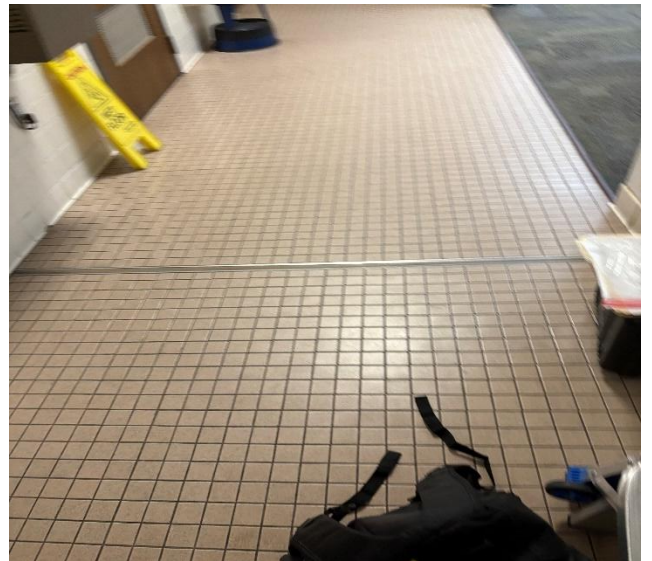
**Photo 1) 3rd Floor Men's Bathroom
(Representative of all Bathrooms)**



**Photo 4) 1st Floor Bathroom Entry -
Overview**



**Photo 2) 3rd Floor Men's Bathroom
(Representative of all Bathrooms)**



**Photo 5) 1st Floor Bathroom Entry -
Overview**



**Photo 3) 3rd Floor Men's Bathroom
(Representative of all Bathrooms)**

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**SECTION 00 4100
BID FORM**

THE PROJECT AND THE PARTIES

1.01 TO:

OWNER

Marathon County Facilities and Capital Management Department
1000 Lakeview Drive, Suite 300 (Door 35)
Wausau, WI 54403
C/O: Craig Christians

1.02 FOR:

MARATHON COUNTY PUBLIC LIBRARY RESTROOM RENOVATION

1. Project: 025037 Marathon County Public Library Restroom Renovation
300 First Street
Wausau, WI 54403

1.03 DATE: _____ (BIDDER TO ENTER DATE)

1.04 SUBMITTED BY: (BIDDER TO ENTER NAME AND ADDRESS)

- A. Bidder's Full Name _____
- 1. Address _____
- 2. City, State, Zip _____

1.05 OFFER

- A. Having examined the place of the Work and all matters referred to in the Instructions to Bidders and the Bid Documents prepared by Martin-Riley architects &engineers, dated 06-23-2025, for the above mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the Sum of:

titled, **Marathon County Public Library - Restroom Revovation-** To include all Labor and Materials to complete the project. (Additional product information and scope of work can be attached to document)

- B. _____ dollars
(\$ _____), in lawful money of the United States of America.

1.06 ACCEPTANCE

- A. If this bid is accepted within the time stated, and we fail to commence the Work or we fail to provide the required Bond(s), the security deposit shall be forfeited as damages to Owner by reason of our failure, limited in amount to the lesser of the face value of the security deposit or the difference between this bid and the bid upon which a Contract is signed.
- B. In the event our bid is not accepted within the time stated above, the required security deposit shall be returned to the undersigned, in accordance with the provisions of the Instructions to Bidders; unless a mutually satisfactory arrangement is made for its retention and validity for an extended period of time.

1.07 CONTRACT TIME

- A. If this Bid is accepted, we will:

1.08 ALTERNATES

- A. The following amounts shall be added or deducted from the bid amount Refer to Section 01 2300 - Alternates.
 - 1. Alternate No. 1: (DEDUCT) \$ _____

1.09 CHANGES TO THE WORK

- A. When Architect establishes that the method of valuation for Changes in the Work will be net cost plus a percentage fee in accordance with General Conditions, our percentage fee will be:
 - 1. _____ percent overhead and profit on the net cost of our own Work;
 - 2. _____ percent on the cost of work done by any Subcontractor.
- B. On work deleted from the Contract, our credit to Owner shall be Architect-approved net cost plus _____ of the overhead and profit percentage noted above.

1.10 ADDENDA

- A. The following Addenda have been received. The modifications to the Bid Documents noted below have been considered and all costs are included in the Bid Sum.
 - 1. Addendum # _____ Dated _____.
 - 2. Addendum # _____ Dated _____.
 - 3. Addendum # _____ Dated _____.
 - 4. Addendum # _____ Dated _____.

1.11 BID FORM SIGNATURE(S)

The Corporate Seal of

(Bidder - print the full name of your firm)

was hereunto affixed in the presence of:

(Authorized signing officer, Title)

(Seal)

(Authorized signing officer, Title)

1.12 IF THE BID IS A JOINT VENTURE OR PARTNERSHIP, ADD ADDITIONAL FORMS OF EXECUTION FOR EACH MEMBER OF THE JOINT VENTURE IN THE APPROPRIATE FORM OR FORMS AS ABOVE.

END OF SECTION 00 4100

**SECTION 00 4336
PROPOSED SUBCONTRACTORS FORM**

PARTICULARS

1.01 HEREWITH IS THE LIST OF SUBCONTRACTORS REFERENCED IN THE BID SUBMITTED BY:

1.02 (BIDDER) _____

1.03 TO (OWNER): MARATHON COUNTY

1.04 DATED _____ AND WHICH IS AN INTEGRAL PART OF THE BID FORM.

1.05 THE FOLLOWING WORK WILL BE PERFORMED (OR PROVIDED) BY SUBCONTRACTORS AND COORDINATED BY US:

LIST OF SUBCONTRACTORS

WORK SUBJECT/DISCIPLINE	SUBCONTRACTOR NAME, ADDRESS, & CONTACT
2.01 _____	_____
2.02 _____	_____
2.03 _____	_____
2.04 _____	_____
2.05 _____	_____
2.06 _____	_____
2.07 _____	_____
2.08 _____	_____
2.09 _____	_____
2.10 _____	_____
2.11 _____	_____
2.12 _____	_____
2.13 _____	_____
2.14 _____	_____
2.15 _____	_____
2.16 _____	_____
2.17 _____	_____
2.18 _____	_____
2.19 _____	_____
2.20 _____	_____
2.21 _____	_____
2.22 _____	_____
2.23 _____	_____
2.24 _____	_____
2.25 _____	_____

END OF SECTION 00 4336

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**SECTION 00 5000
CONTRACTING FORMS AND SUPPLEMENTS**

PART 1 GENERAL

1.01 AGREEMENT AND CONDITIONS OF THE CONTRACT

- A. See Section 00 5200 - Agreement Form for the Agreement form to be executed.
- B. See Section 00 7200 - General Conditions for the General Conditions.
- C. See Section 00 7300 for the Supplementary Conditions.
- D. The Agreement is based on AIA A101.
- E. The General Conditions are based on AIA A201.

1.02 FORMS

- A. Use the following forms for the specified purposes unless otherwise indicated elsewhere in Contract Documents.
- B. Bond Forms:
 - 1. Bid Bond Form: AIA A310.
 - 2. Performance and Payment Bond Form: AIA A312.
- C. Post-Award Certificates and Other Forms:
 - 1. Schedule of Values Form: AIA G703.
 - 2. Application for Payment Forms: AIA G702 with AIA G703 (for Contractors).
- D. Closeout Forms:
 - 1. Certificate of Substantial Completion Form: AIA G704.

REFERENCE STANDARDS

- A. AIA A101 - Standard Form of Agreement Between Owner and Contractor where the basis of Payment is a Stipulated Sum; 2007.
AIA A201 - General Conditions of the Contract for Construction; 2017
- B. AIA A310 - Bid Bond; 2010.
- C. AIA A312 - Performance Bond and Payment Bond; 2010.
- D. AIA G702 - Application and Certificate for Payment; 1992.
- E. AIA G703 - Continuation Sheet; 1992.
- F. AIA G704 - Certificate of Substantial Completion; 2000.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 00 5000

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**SECTION 00 5200
AGREEMENT FORM**

PART 1 GENERAL

1.01 FORM OF AGREEMENT

- A. AIA Document A101, Owner-Contractor Agreement Form - Stipulated Sum 2017 or current edition, forms the basis of Contract between the Owner and Contractor.

1.02 RELATED REQUIREMENTS

- A. Section 00 7200 - General Conditions.
- B. Section 00801 - Supplementary Conditions.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 00 5200

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**SECTION 00 7200
GENERAL CONDITIONS**

PART 1 FORM OF GENERAL CONDITIONS

1.01 THE GENERAL CONDITIONS APPLICABLE TO THIS CONTRACT ARE INCORPORATED INTO THE PROJECT MANUAL BY REFERENCE, AND ARE A PART OF THE DOCUMENTS AS MUCH AS IF THEY HAD BEEN REPRINTED IN THEIR ENTIRETY.

- A. AIA Document A201 - 2017, "General Conditions of the Contract for Construction", Articles 1 through 15, as published by The American Institute of Architects, 1735 New York Avenue, N.W., Washington, D.C. 20006 are hereby, except as may be inconsistent herewith, made part of these Contract Documents.

1.02 RELATED REQUIREMENTS

- A. Section 00 7300 - Supplementary Conditions.

PART 2 SUPPLEMENTARY CONDITIONS

2.01 REFER TO DOCUMENT 00 7300 FOR AMENDMENTS TO THESE GENERAL CONDITIONS.

END OF SECTION 00 7200

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**SECTION 00 7300
SUPPLEMENTARY CONDITIONS**

GENERAL**1.01 SUMMARY**

1.02 THESE SUPPLEMENTARY CONDITIONS AMEND AND SUPPLEMENT THE "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION" DEFINED IN DOCUMENT 00 7200 AND OTHER PROVISIONS OF THE CONTRACT DOCUMENTS AS INDICATED BELOW.

WHERE ANY ARTICLE OF THE GENERAL CONDITIONS IS MODIFIED OR ANY PARAGRAPH, SUBPARAGRAPH OR CLAUSE THEREOF IS MODIFIED OR DELETED BY THESE SUPPLEMENTS, THE UNALTERED PROVISIONS OF THAT ARTICLE, PARAGRAPH, SUBPARAGRAPH, OR CLAUSE SHALL REMAIN IN FULL FORCE AND EFFECT.

THE TERMS USED IN THESE SUPPLEMENTARY CONDITIONS THAT ARE DEFINED IN THE GENERAL CONDITIONS HAVE THE MEANINGS ASSIGNED TO THEM IN THE GENERAL CONDITIONS.

ARTICLE 1 GENERAL PROVISIONS**2.01 1.2.1, ADD THE FOLLOWING SENTENCE:**

- A. In the case of an inconsistency between Drawings and Specifications or within either Document not clarified by addendum, the better quality or greater quantity of Work shall be provided in accordance with the Architect's interpretation.

2.02 1.7, ADD THE FOLLOWING PARAGRAPH:

- A. 1.7.1, The Architect may, with the concurrence of the Owner, furnish to the Contractor versions of Instruments of Service in electronic form. The Contract Documents executed or identified in accordance with Section 1.5.1 shall prevail in case of an inconsistency with subsequent versions made through electronic means involving computers.

2.03 1.7, ADD THE FOLLOWING PARAGRAPH:

- A. 1.7.2, The Contractor shall not transfer or reuse Instruments of Service in electronic or machine readable form without the prior written consent of the Architect.

ARTICLE 3 CONTRACTOR**3.01 3.1.1, ADD THE FOLLOWING SUBPARAGRAPH:**

- A. 3.1.1.1, The Contractor should be in the business and regularly engaged in the type of construction as outlined in the Contract Documents and as specified herein for a minimum period of five (5) years and be properly licensed in the jurisdiction where the Project is constructed.

3.02 3.2.2, ADD THE FOLLOWING SUBPARAGRAPH:

- A. 3.2.2.1, The Contractor shall completely review the Contract Documents for errors, omissions or inconsistencies no later than 15 days prior to the commencement of Work or 3 days prior to the Pre-Construction meeting and submit written requests for clarification.

3.03 3.4.2, ADD THE FOLLOWING SUBPARAGRAPHS:

- A. 3.4.2.1, After receipt of notice of contract award, the Owner and the Architect will consider a formal request for the substitution of products in place of those specified.
- B. 3.4.2.2, By making requests for substitutions based on Subparagraph 3.4.2 above, the Contractor:
1. .1 Represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;
 2. .2 Represents that the Contractor will provide the same warranty for the substitution that the Contractor would for that specified
 3. .3 Certifies that the cost data presented is complete and includes all related costs under this Contract except the Architect's redesign costs, and waives all claims for additional costs related to the substitution which subsequently become apparent; and

4. .4 Will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.
5. .5 Will be responsible for additional costs of the Architect required to redesign, or issue modified documents.

3.9.1, CHANGE TO READ AS FOLLOWS:

The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the project site during the performance of the Work until substantial completion, and for such additional time thereafter as the Architect may determine to be necessary for the expeditious completion of the Work. The Contractor shall not reassign or remove the superintendent to other projects prior to Substantial Completion. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. Important communications shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case. The Contractor shall remove the superintendent if requested to do so in writing by the Owner, and shall promptly replace him with a competent person reasonably acceptable to the Owner.

3.04 3.12.5, ADD THE FOLLOWING:

- A. Shop Drawings, Product Data, Samples and other similar submittals which, by their markings and notations placed on them by the Contractor, do not graphically demonstrate his/her understanding of the elements or materials inclusion into the Work shall be returned without action or further comment.

3.05 3.13, ADD THE FOLLOWING PARAGRAPH:

- A. 3.13.1, The Contractor shall abide by the rules of the Owner regarding the use of the premises and will confine activities to the areas designated.

3.06 3.14, ADD THE FOLLOWING PARAGRAPH:

- A. 3.14.3, Cutting and patching shall be done by the construction trades whose work is being cut or patched, irrespective of the Contractor responsible for or requiring the cutting and patching work.

ARTICLE 5 SUBCONTRACTORS

4.01 5.2.1, CHANGE THE FIRST SENTENCE TO READ AS FOLLOWS:

- A. Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, no later than 24 hours after the receipt of notice of contract award, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work.

4.02 5.2, ADD THE FOLLOWING NEW PARAGRAPH:

- A. 5.2.5, Financial irresponsibility as determined by Owner and past record of failure to perform work on schedule shall be a valid reason for a reasonable objection to any such person or entity.

ARTICLE 7 CHANGES IN THE WORK

5.01 7.2.1.3, ADD, THE FOLLOWING SUBPARAGRAPHS:

- A. 7.2.1.3.1, Methods used in determining adjustments to the Contract Sum shall be as follows:
 1. .1 15 percent overhead and profit on the net cost of Work done by the Contractor;
 2. .2 5 percent overhead and profit on the cost of Work done by any Subcontractor;
 3. .3 On Work deleted from the Contract, credit to the Owner shall be the Architect approved net cost plus 1/2 of the overhead and profit percentage noted above.

ARTICLE 9 PAYMENTS AND COMPLETION,

6.01 9.2, ADD THE FOLLOWING PARAGRAPH:

- A. 9.2.1, The Contractor's submitted schedule of values shall include base bid items, accepted alternates and all overhead and profit. These items shall be listed separately. Contract contingency amounts and/or allowances shall be listed on their own separate lines.

6.02 9.3.1, ADD THE FOLLOWING SENTENCES:

- A. The Application for Payment shall be submitted in triplicate, unless otherwise indicated in the Contract Documents. The form of Application for Payment shall be a notarized original AIA Document G702, Application and Certificate for Payment, supported by AIA Document G703, Continuation Sheet. Copies may be made of completed Documents, but use of illegal photocopies of AIA Documents shall be cause for rejection of the Application.

6.03 9.3.1, ADD THE FOLLOWING SUBPARAGRAPHS:

- A. 9.3.1.3, Until the Work is fifty (50) percent complete, the Owner shall retain ten (10) percent of each progress payment for Work completed and material delivered and stored at the site but not incorporated into the Work. At the time the Work is fifty (50) percent complete, the Contractor may request that no further retainage be withheld from future progress payments. If such request is approved and the manner of completion of the Work and its progress are to remain satisfactory to the Owner and the Architect, and in the absence of good and sufficient reason, the Architect will on the presentation of the Contractor of consent of surety, if any, authorize any remaining progress payments to be paid in full.

9.3.1.4, If upon Substantial Completion of the Work there are any remaining uncompleted items, the Owner shall withhold, until those items are completed, an amount equal to up to three hundred percent (300%) of the value of each item as determined by the Architect or Owner.

6.04 9.8.3, ADD THE FOLLOWING SUBPARAGRAPH:

- A. 9.8.3.1, Except with the consent of the Owner, the Architect will perform no more than two (2) final observation(s) to determine whether the Work or a designated portion thereof has attained Substantial Completion in accordance with the Contract Documents. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for any additional observations.

6.05 9.8.5, DELETE THE SECOND SENTENCE AND SUBSTITUTE WITH THE FOLLOWING:

- A. Upon such acceptance and consent of surety, if any, the Owner shall make payment sufficient to increase the total payments to 100 percent of the Contract Sum, less such amounts as the Architect shall determine for incomplete Work and unsettled claims.

6.06 9.10.1, ADD THE FOLLOWING SUBPARAGRAPH:

- A. 9.10.1.1, Except with the consent of the Owner, the Architect will perform no more than one attempt(s) to determine whether the Work or a designated portion thereof has attained Final Completion in accordance with the Contract Documents. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for any additional observations.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

7.01 10.2.4, ADD THE FOLLOWING SUBPARAGRAPH:

- A. 10.2.4.1, When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary, the Contractor shall give the Owner reasonable advance notice.

7.02 10.3.4, ADD THE FOLLOWING SUBPARAGRAPH:

- A. 10.3.4.1, The Contractor warrants to the Owner and Architect that no materials containing asbestos or polychlorinated biphenyl (PCB) will be permitted in the Project or under the contract. Each contractor shall furnish to the Owner and Architect a sworn affidavit stating that

materials used under this contract did not contain asbestos or polychlorinated biphenyl (PCB) upon completion of the project.

ARTICLE 11 INSURANCE AND BONDS

8.01 11.1.1, ADD THE FOLLOWING AFTER "COMPANIES" IN LINE 4:

A. ". . . rated A+ or A by Best Insurance Reports and . . ."

8.02 11.1.1, ADD THE FOLLOWING SUBPARAGRAPH:

A. 11.1.1.1 General Liability coverages on a claims-made basis shall not be acceptable

ARTICLE 13 MISCELLANEOUS PROVISIONS

9.01 13.4.1, DELETE THE LAST SENTENCE, AND REPLACE WITH THE FOLLOWING:

A. The Contractor shall bear all costs for tests, inspections, approvals, and performance testing as required in the Contract Documents unless otherwise noted, or where building codes or applicable laws or regulations prohibit the Owner from delegating their costs to the Contractor.

9.02 13.5. DELETE PARAGRAPH IN ITS ENTIRETY.

9.03 13.6 ADD THE FOLLOWING PARAGRAPH AND SUBPARAGRAPHS:

A. 13.6, EQUAL OPPORTUNITY

1. 13.6.1, The Contractor shall maintain policies of employment as follows:

- a. 13.6.1.1 The Contractor and the Contractor's Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, or national origin. The Contractor shall take affirmative action to insure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex 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 applicant for employment, notices setting forth the policies of nondiscrimination.
- b. 13.8.1.2 The Contractor and the Contractor's Subcontractors shall, in all solicitation or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex or national origin.

9.04 ADD THE FOLLOWING ARTICLE AND THE FOLLOWING PARAGRAPHS AND SUBPARAGRAPHS:

END OF SECTION 00 7300

Standard Terms And Conditions

- 1.0 SPECIFICATIONS:** The specifications in any request for bids or proposal which forms the subject of this contract are the minimum acceptable. When specific manufacturer and model numbers are used, they are to establish a design, type of construction, quality, functional capability and/or performance level desired. When alternates are bid/proposed/provided, they must be identified by manufacturer, stock number, and such other information necessary to establish equivalency. Marathon County shall be the sole judge of equivalency. _____ are cautioned to avoid bidding/proposing alternates to the specifications which may result in rejection of their bid/proposal.
- 2.0 DEVIATIONS AND EXCEPTIONS:** Deviations and exceptions from original text, terms, conditions, or specifications shall be described fully, on the _____'s letterhead, signed, and attached to the response to request. In the absence of such statement, the bid/proposal shall be accepted as in strict compliance with all terms, conditions, and specifications and the _____s shall be held liable.
- 3.0 ACCEPTANCE-REJECTION OF BIDS OR PROPOSALS:** Marathon County reserves the right to accept or reject any or all bids/proposals, to waive any technicality in any bid/proposal submitted, and to accept any part of a bid/proposal as deemed to be in the best interests of Marathon County.
- Bids/proposals MUST be date and time stamped by the office of the soliciting purchasing agent on or before the date and time that the bid/proposal is due. Bids/proposals date and time stamped in another office will be rejected. Receipt of a bid/proposal by the mail system does not constitute receipt of a bid/proposal by the purchasing agent's office
- 4.0 METHOD OF AWARD:** Award of bids shall be made to the lowest responsible, responsive bidder unless otherwise specified. Award of proposals shall be subject to criteria set for in the request for proposal.
- 5.0 QUALITY:** Unless otherwise indicated in the request, all material shall be first quality. Items which are used, demonstrators, obsolete, seconds, or which have been discontinued are unacceptable without specific prior written approval by the Marathon County.
- 6.0 WARRANTY:** Unless otherwise specifically stated by the bidder/proposer, equipment purchased as a result of this request shall be warranted against defects by the bidder/proposer for one (1) year from date of receipt. The equipment manufacturer's standard warranty shall apply as a minimum and must be honored by the contractor.
- 7.0 DELIVERY:** Deliveries shall be F.O.B. destination freight prepaid and included unless otherwise specified.
- Failure of the _____ to adhere to delivery schedules as specified or to promptly replace rejected materials shall render the _____ liable for all costs in excess of the contract price when alternate procurement is necessary. Excess costs shall include the administrative costs.
- 8.0 ORDERING:** Purchase orders shall be placed directly to _____ by authorized departments or purchasing agents who have issued the request for bids or proposal. No other purchase orders are authorized.
- 9.0 PAYMENT TERMS AND INVOICING:** Marathon County normally will pay properly submitted _____ invoices within thirty (30) days of receipt providing goods and/or services have been delivered, installed (if required), and accepted as specified.
- 9.1 Invoices presented for payment must be submitted in accordance with instructions contained on the purchase order including reference to purchase order number and submittal to the correct address for processing.
- 9.2 A good faith dispute creates an exception to prompt payment.
- 10.0 TAXES:** Marathon County and its departments are exempt from payment of all federal tax and Wisconsin state and local taxes on its purchases except Wisconsin excise taxes as described below.
- Marathon County, including all its departments, is required to pay the Wisconsin excise or occupation tax on its purchase of beer, liquor, wine, cigarettes, tobacco products, motor vehicle fuel and general aviation fuel. However, it is exempt from payment of Wisconsin sales or use tax on its purchases. Marathon County may be subject to other states' taxes on its purchases in that state depending on the laws of that state. Contractors performing construction activities are required to pay state use tax on the cost of materials.
- 11.0 CONTRACT INTEGRATION:** These Standard Terms and Conditions shall apply to any contract or order awarded as a result of a request except where special requirements are stated elsewhere in the request; in such cases, the special requirements shall apply
- The documents constituting the contract between the Marathon County and _____ are intended to be complementary so that what is required by any one of them shall be as binding as if called for by all of them. In the event of any conflicting provisions or requirements within the several parts of the Contract Documents, they shall take precedence in the following order: Change Orders (with the most recent taking precedence); Contract Document Amendments; the Contract Document as described in this signed Agreement; Request for Proposal Addenda; Request for Proposal; and Firm's Proposal. Any terms of any other documents concerning this agreement are superseded by the terms set forth herein.
- 12.0 APPLICABLE LAW AND COMPLIANCE:** This contract shall be governed under the laws of the State of Wisconsin. _____ shall at all times comply with and observe all federal and state laws, local laws, ordinances, and regulations which are in effect during the period of this contract and which in any manner affect the work or its conduct. Marathon County reserves the right to cancel this contract if _____ fails to follow the requirements of s. 77.66, Wis. Stats., and related statutes regarding certification for collection of sales and use tax.
- 13.0 SAFETY REQUIREMENTS:** All materials, equipment, and supplies provided to Marathon County must comply fully

with all safety requirements as set forth by the Wisconsin Administrative Code and all applicable OSHA Standards.

13.1 _____ shall execute and maintain its work so as to avoid injury or damager to any persons or property. _____ shall comply with the requirements and specifications relating to safety measures applicable in particular operations or kinds of work. In carrying out its work, _____ shall, at all times, exercise all necessary precautions for the safety of employees appropriate to the nature of the work and the conditions under which the work is to be performed and be in compliance with all applicable federal, state and local statutory and regulatory requirements including Wisconsin Labor Code and the U.S.Department of Transportation Omnibus Transportation Employee Testing Act, including the obligation to conduct safety inspections to verify said compliance by its employees, agents, and/or subcontractors.

13.2 _____ is specifically notified that it is subject to federal requirements listed under Title 29, Chapter 15 of the United States Code (Occupational Health and Safety Act) by virtue of its contract with Marathon County, a public entity. _____ shall provide a similar notice to all its subcontractors.

13.3 SAFETY DATA SHEET: If any item(s) on an order(s) resulting from this award(s) is a hazardous chemical, as defined under 29CFR 1910.1200, provide one (1) copy of a Material Safety Data Sheet for each item with the shipped container(s) and one (1) copy with the invoice(s).

14.0 INSURANCE REQUIREMENTS: _____ shall not commence work under this contract until all insurance required under this paragraph is obtained, and such insurance has been approved Marathon County, nor shall _____ allow any subcontractor to commence work on their subcontract until all similar insurance requirements have been obtained and approved.

14.1 Maintain worker's compensation insurance as required by Wisconsin Statutes, for all employees engaged in the work. In case any work is sublet, _____ shall require the subcontractor similarly to provide statutory Workers' Compensation Insurance for all of the latter's employees, unless such employees are covered by the protection afforded by _____.

14.2 General Liability, Professional Liability and Property Damage Insurance. _____ shall secure and maintain in force throughout the duration of this contract such General Liability, Professional Liability (if necessary) and Property Damage Insurance as shall protect itself and any subcontractor performing work covered by this contract from claims for damages for personal injuries including accidental death, as well as from claims for property damage, which may arise from operations under this contract, whether such operations be by _____, or by any subcontractor or by anyone directly or indirectly employed by either of them; and the amount of such insurance shall be as follows:

- Comprehensive General Liability \$1,000,000 per occurrence and \$2,000,000 in aggregate for bodily injury and property damage.

- Professional Liability Coverage, \$1,000,000 per occurrence and \$2,000,000 in aggregate.
- Automobile Liability \$1,000,000 Combined Single Limit for bodily injury and property damage.
- Excess Liability Coverage, \$1,000,000 over the General Liability and Automobile Liability Coverage.
- If aircraft are used in conjunction with this project, \$2,000,000 per occurrence and in aggregate for bodily injury and property damage.

14.3 Marathon County reserves the right to require higher or lower limits where warranted.

14.4 Marathon County reserves the right to require additional security, including, but not limited to, bid bonds or performance bonds as specifically set forth in its request for bids or proposals.

14.5 PROOF OF INSURANCE: _____ shall furnish the County with a Certificate of Insurance countersigned by a Wisconsin Resident Agent or Authorized Representative of the insurer indicating that _____ meets the insurance requirements identified above. The Certificates of Insurance shall include a provision prohibiting cancellation of said policies except upon 30 days prior written notice to the County and specify the name of the contract or project covered. The Certificate of Insurance shall be delivered to the Authorized Purchasing Agent, with a copy of the Certificate of Insurance to be delivered to the Marathon County Risk Manager for approval prior to the execution of this contract. Upon renewal of the required insurance, and annually thereafter, the County shall receive a new Certificate of Insurance for three years after completion of the project. The Certificates shall name Marathon County as an additional insured and describe the contract by name and or identification number in the "Description of Operations" section of the form.

15.0 CANCELLATION / TERMINATION: Marathon County reserves the right to:

15.1 NONAPPROPRIATION OF FUNDS. Cancel any contract in whole or in part without penalty due to nonappropriation of funds or for failure of the contractor to comply with terms, conditions, and specifications of this contract.

15.2 Terminate this contract, for the County's convenience, at any time by a notice in writing from the County to _____ by certified mail. If the Contract is terminated by the County as provided herein, _____ shall be paid an amount which bears the same ratio to the total compensation as the services actually performed bear to the total services of _____ covered by this Contract, unless payments of compensation have previously been made.

16.0 CONTRACT MODIFICATIONS: The scope of the services to be performed under this Contract may be amended or supplemented by mutual written agreement between the

parties to the Contract. This amendatory provision shall not operate to prevent Marathon County from exercising its reserved right to establish reasonable time schedules for any of the work or services to be performed by or deliveries to be received from _____ hereunder. Furthermore, this amendatory provision shall not operate to prevent the County from canceling any of the services not yet performed or any deliveries not yet made at the time notice is given to _____ of the cancellation of such services or portion of the work to be performed hereunder.

17.0 ASSIGNMENT: No right or duty in whole or in part of the _____ under this contract may be assigned or delegated without the prior written consent of Marathon County.

18.0 PATENT INFRINGEMENT: The _____ selling articles to Marathon County as described herein guarantees the articles were manufactured or produced in accordance with applicable federal labor laws. Further, that the sale or use of the articles described herein will not infringe any United States patent. The contractor covenants that it will at its own expense defend every suit which shall be brought against Marathon County (provided that such contractor is promptly notified of such suit, and all papers therein are delivered to it) for any alleged infringement of any patent by reason of the sale or use of such articles, and agrees that it will pay all costs, damages, and profits recoverable in any such suit.

19.0 PUBLIC RECORDS ACCESS: Marathon County is a political subdivision of the State of Wisconsin and as such is subject to the Wisconsin Public Records Law. It is the policy of Marathon County to maintain an open and public process in the solicitation, submission, review, and approval of procurement activities.

Bid openings are public unless otherwise specified. Evaluations of responses to requests for proposals are subject to further discussion, clarification and negotiation. Records of bids and responses to requests for proposal will not be available for public inspection prior to issuance of the award of the contract.

20.0 PROPRIETARY INFORMATION: Any restrictions on the use of data contained within a response to request, must be clearly stated in the bid/proposal itself. Proprietary information submitted in response to a request will be handled in accordance with the Wisconsin Public Records Law. Proprietary restrictions normally are not accepted. However, when accepted, it is _____'s responsibility to defend the determination in the event of an appeal or litigation.

20.1 Data contained in a bid/proposal, all documentation provided therein, and innovations developed as a result of the contracted commodities or services cannot be copyrighted or patented. All data, documentation, and innovations become the property of Marathon County.

20.2 Any material submitted by _____ in response to Marathon County's request that the vendor considers confidential and proprietary information and which qualifies as a trade secret, as provided in s. 19.36(5), Wis. Stats., or material which can be kept confidential under the Wisconsin Public Records Law, must be identified and include citation to the specific provisions of law that preclude

disclosure and any factual or background information necessary to establish that the identified provisions of the law apply to that particular information. Bid/proposal prices cannot, under any circumstances, be held confidential.

20.3 In the event Marathon County becomes involved in litigation due to _____'s refusal of permission to release information identified as confidential or proprietary, _____ agrees to indemnify, defend and hold harmless Marathon County for any costs associated with said litigation.

21.0 CONFIDENTIALITY OF MARATHON COUNTY'S DATA: In the event work conducted under this contract requires _____ to have access to Marathon County's database via Internet, direct contact or other connection to allow the provision of installation, support and maintenance services, _____ agrees to keep all such data confidential and to execute any reasonable agreement to assure Marathon County that _____ will comply with all state and federal confidentiality laws and/or regulations. These restrictions herein shall survive the termination of this contract, regardless of the reason for termination, and shall continue in full force and effect and shall be binding upon _____ or its agents, employees, successors, assigns or subcontractors. _____ shall defend and incur all costs, if any, for actions that arise as a result of noncompliance by _____, its agents, employees, successors, assigns and subcontractors regarding the confidentiality restrictions herein.

22.0 PROMOTIONAL ADVERTISING / NEWS RELEASES: Reference to or use of Marathon County, any of its departments, agencies or other subunits, or any county official or employee for commercial promotion is prohibited. News releases pertaining to this procurement shall not be made without prior approval of Marathon County. Release of broadcast e-mails pertaining to this procurement shall not be made without prior written authorization of Marathon County's purchasing agent.

23.0 MUTUAL HOLD HARMLESS/INDEMNIFICATION
_____ hereby agrees to release, indemnify, defend, and hold harmless Marathon County, its officials, officers, employees and agents from and against all judgments, damages, penalties, losses, costs, claims, expenses, suits, demands, debts, actions and/or causes of action of any type or nature whatsoever, including actual and reasonable attorney's fees, which may be sustained or to which they may be exposed, directly or indirectly, by reason of personal injury, death, property damage, or other liability, alleged or proven, which is determined to be caused by the negligent or intentional acts or omissions of _____'s officers, officials, employees, agents or assigns.

Marathon County hereby agrees to release, indemnify, defend, and hold harmless _____, its officials, officers, employees and agents from and against all judgments, damages, penalties, losses, costs, claims, expenses, suits, demands, debts, actions and/or causes of action of any type or nature whatsoever, including actual and reasonable attorney's fees, which may be sustained or to which they may be exposed, directly or indirectly, by reason of personal injury, death, property damage, or other liability, alleged or proven, which is determined to be caused by the negligent or intentional acts or omissions of

Marathon County's officers, officials, employees, agents or assigns.

Marathon County does not waive, and specifically reserves, its rights to assert any and all affirmative defenses and limitations of liability as specifically set forth in Wisconsin Statutes, Chapter 893 and related statutes.

24.0 FORCE MAJEURE: Neither party shall be in default by reason of any failure in performance of this Agreement in accordance with reasonable control and without fault or negligence on their part. Such causes may include, but are not restricted to, acts of nature or the public enemy, acts of the government in either its sovereign or contractual capacity, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes and unusually severe weather, but in every case the failure to perform such must be beyond the reasonable control and without the fault or negligence of the party.

25.0 GRATUITIES AND KICKBACKS

It shall be unethical for any person to offer, give, or agree to give any elected official, employee or former employee, or for any elected official, employee or former employee to solicit, demand, accept, or agree to accept from another person, a gratuity or an offer for employment in connection with any decision, approval, disapproval, recommendation, preparation or any part of a program requirement or a purchase request, influencing the contents of any specification or procurement standard, rendering of advice, investigation, auditing, or in any other advisory capacity in any proceedings or application, request for ruling, determination, claim or controversy, or other particular matter, pertaining to any program requirement or a contract or subcontract, or to any solicitation or proposal therefore.

It shall be unethical for any payment, gratuity, or offer of employment to be made by or on behalf of a subcontractor under a contract to the prime contractor or a higher tier subcontractor or any person associated therewith, as an inducement for the award of a subcontract, or order.

26.0 DISPUTE RESOLUTION: This Contract and the performance of the parties' obligations hereunder will be governed by and construed and enforced in accordance with the laws of the State of Wisconsin, including conflict of laws provisions. _____ consents to personal jurisdiction in the State of Wisconsin. The venue of any action hereunder shall be in Marathon County, Wisconsin.

If a dispute related to this agreement arises, all parties shall attempt to resolve the dispute through direct discussions and negotiations. If the dispute cannot be resolved by the parties, and if all parties agree, it may be submitted to either mediation or arbitration. If the matter is arbitrated, the procedures of Chapter 788 of the Wisconsin Statutes or any successor statute shall be followed. If the parties cannot agree to either mediation or arbitration, any party may commence an action in court as set forth above. If a lawsuit is commenced, the parties agree that the dispute shall be submitted to alternate dispute resolution pursuant to §802.12, Wis. Stats., or any successor statute.

Unless otherwise provided in this contract, the parties shall continue to perform according to the terms and conditions of the contract during the pendency of any litigation or other dispute resolution proceeding.

27.0 INDEPENDENT CONTRACTOR STATUS: The parties hereto agree that Contractor, its officers, agents and

employees, in the performance of this Contract, shall act in the capacity of an independent contractor and not as an officer, employee or agent of Marathon County. The Contractor shall not be entitled to any of the rights, benefits, salaries, wages or fringe benefits which employees of Marathon County are eligible to receive. No federal, state, or local taxes or social security deductions or contributions shall be made by Marathon County on behalf of the Contractor. Neither Marathon County nor Contractor will represent itself as the agent or legal representative of the other or as partner or joint venturers for any purpose whatsoever, and neither shall have any right to create or assume any obligation of any kind, express or implied, for or on behalf of the other in any way whatsoever. Furthermore, Contractor agrees to take such steps as are necessary to ensure that each of its subcontractors, if any, will not be considered to be an agent, servant, joint venturer with, or partner of, Marathon County.

28.0 NON-DEBARMENT CLAUSE: _____ hereby certifies that neither it nor any of its principal officers or officials has ever been suspended or debarred, for any reason whatsoever, from doing business or entering into contractual relationships with any governmental entity. _____ further agrees and certifies that this clause shall be included in any subcontract of this contract. . Marathon County also reserves the right to cancel this contract with any federally debarred contractor or a contractor that is presently identified on the list of parties excluded from federal or State of Wisconsin procurement and non-procurement contracts.

29.0 STATEMENT OF COMPLIANCE: _____ has carefully reviewed Marathon County's required contract language, as set forth in the Request for Proposal/Bid pertaining to termination of contract, change orders, gratuities and kickbacks, non-appropriation of funds, hold harmless/indemnification, insurance requirements/proof of insurance, dispute resolutions, and non-debarment, and is in full compliance with all statements and requirements.

30.0 WAIVER/SEVERABILITY: No waiver of any default hereunder shall be deemed as a waiver of any prior or subsequent default of the same or other provisions of this contract. If any provision of this contract is held invalid by a court of competent jurisdiction, such invalidity shall not affect the validity or operation of any other provision and said provision shall continue to apply to the extent allowed by said court or, if not so allowed, be deemed severed from this contract entirely.

**SECTION 01 1000
SUMMARY****PART 1 GENERAL****1.01 PROJECT**

- A. Project Name: O25037 Marathon County Public Library Restroom Renovation
- B. Owner's Name: Marathon County Facilities and Capital Management Department.
- C. Architect's Name: MartinRiley architects-engineers, 404 N. Main Street, Suite 601, Oshkosh, WI 54901
- D. The Project consists of the alteration of an existing open area on floor 1 to create (3) small study rooms (refer to Alternates 01 2300) and the renovation of several public restroom areas. The renovations of (4) public restrooms consist of (1) pair of restrooms per floor (basement, floor 1, floor 2, floor 3). These restrooms are similar but not identical in size and configuration. Also included is the renovation of (1) pair of single toilet / family restrooms on floor 1. .

1.02 CONTRACT DESCRIPTION

- A. Contract Type: A single prime contract based on a Stipulated Price as described in Document 00 5200 - Agreement Form.

1.03 DESCRIPTION OF ALTERATIONS WORK

- A. Scope of demolition and removal work is indicated on drawings and specified in Section 02 4100.
- B. Renovate the following areas, complete including operational mechanical and electrical work and finishes:
- C. HVAC: Alter existing system and add new construction, keeping existing in operation.
- D. Electrical Power and Lighting: Alter existing system and add new construction, keeping existing in operation.
- E. Fire Suppression Sprinklers: Alter existing system and add new construction, keeping existing in operation.
- F. Fire Alarm: Alter existing system and add new construction, keeping existing in operation.

1.04 OWNER OCCUPANCY

- A. Owner intends to continue to occupy portions of the existing building, not being affected by the sequencing of work, during the entire construction period.
- B. Owner intends to fully occupy the Project upon Substantial Completion.
- C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- D. Schedule the Work to accommodate Owner's use and occupancy.

1.05 CONTRACTOR USE OF SITE AND PREMISES

- A. Construction Operations: Limited to areas noted on Drawings.
- B. Arrange use of site and premises to allow:
 - 1. Owner occupancy.
 - 2. Use of site and premises for limited public access.
- C. Provide access to and from site as required by law and by Owner:
 - 1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
 - 2. Do not obstruct on-site roadways, driveways or sidewalks without owner's permission.
 - 3. Do not obstruct public roadways, sidewalks, or other public ways without permit.
- D. Existing building spaces may not be used for storage.

E. Utility Outages and Shutdown:

1. Limit disruption of utility services to hours the building is unoccupied or as otherwise approved by owner.
2. Do not disrupt or shut down life safety systems including, but not limited to, fire sprinklers and fire alarm system without 3 working days notice to Owner (and approval) and authorities having jurisdiction.
3. Do not disrupt or shut down security systems including, but not limited to, security cameras without 3 working days notice to and approval by Owner.
4. Prevent accidental disruption of utility services to this and other facilities.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 1000

**SECTION 01 2000
PRICE AND PAYMENT PROCEDURES**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Procedures for preparation and submittal of applications for progress payments.

1.02 RELATED REQUIREMENTS

- A. Section 00 5000 - Contracting Forms and Supplements: Forms to be used.
- B. Section 00 5200 - Agreement Form: Contract Sum, retainages, payment period, monetary values of unit prices.
- C. Section 00 7200 - General Conditions: Additional requirements for progress payments, final payment, changes in the Work.
- D. Section 00 7300 - Supplementary Conditions: Percentage allowances for Contractor's overhead and profit.
- E. Section 01 7800 - Closeout Submittals: Project record documents.

1.03 SCHEDULE OF VALUES

- A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.
- B. Forms filled out by hand will not be accepted.
- C. Submit a printed schedule on AIA Form G703 - Application and Certificate for Payment Continuation Sheet. Contractor's standard form or electronic media printout will be considered.
- D. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.
- E. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification Section. Identify site mobilization, bonds and insurance, and accepted alternates, contingency and or other allowances shall be listed on their own separate lines.
- F. Include in each line item, the amount of Allowances specified in this section. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.
- G. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including Submittals Schedule and Application for Payment forms with Continuation Sheets.
- H. Sub-schedules: Where the Work is separated into phases requiring separately phased payments, provide sub-schedules showing values correlated with each phase of payment.
- I. Revise schedule to list approved Change Orders, with each Application For Payment.
- J. Include within each line item, a direct proportional amount of Contractor's overhead and profit.
- K. Revise schedule to list approved Change Orders, with each Application For Payment.
- L. Provide breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
- M. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
- N. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
- O. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

- P. Allowances: Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
- Q. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - 1. Temporary facilities and other major cost items that are not direct cost of actual work-in place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's Option.
- R. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

- A. Payment Period: Submit at intervals stipulated in the Agreement.
- B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
- C. Forms filled out by hand will not be accepted.
- D. Present required information in typewritten form.
- E. Form: AIA G702 Application and Certificate for Payment and AIA G703 - Continuation Sheet including continuation sheets when required.
 - 1. Execute Application on ORIGINAL AIA Documents. Completed (filled out) Documents may be copied for submission. Use of illegal photocopies of AIA Documents will be cause for rejection of Application, and possible delay in payment.
- F. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
 - 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- G. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.
- H. Present required information in typewritten form.
- I. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 - 1. Entries shall match data on the Schedule of Values and Contractors Construction Schedule. Use updated schedules if revisions were made.
 - 2. Include amounts of Unit Prices, Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- J. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
 - 1. Submit partial waivers on each item for amount requested, before deduction for retainage, on each item.
 - 2. When an application shows completion of an item, submit final or full waivers.
 - 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 - 4. Waiver Delays: Submit each Application for Payment with Contractor's Waiver of mechanic's lien for construction period covered by the application.
 - a. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.

- K. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
 - 1. List of subcontractors
 - 2. Schedule of Values
 - 3. Contractor's Construction Schedule (preliminary if not final)
 - 4. Submittals Schedule (preliminary if not final)
 - 5. List of Contractor's staff assignments
 - 6. Copies of building permits
 - 7. Copies of authorizations and licenses from authorities having jurisdiction for performance of the work
 - 8. Certificates of insurance and insurance policies
 - 9. Performance and payment bonds
 - 10. Data needed to acquire Owner's insurance
- L. For each item, provide a column for listing each of the following:
 - 1. Item Number.
 - 2. Description of work.
 - 3. Scheduled Values.
 - 4. Previous Applications.
 - 5. Work in Place and Stored Materials under this Application.
 - 6. Authorized Change Orders.
 - 7. Total Completed and Stored to Date of Application.
 - 8. Percentage of Completion.
 - 9. Balance to Finish.
 - 10. Retainage.
- M. Execute certification by signature of authorized officer.
- N. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored Products.
- O. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of Work.
- P. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.
- Q. Execute certification by signature of authorized officer.
- R. Submit one electronic and three hard-copies of each Application for Payment.

1.05 MODIFICATION PROCEDURES

- A. For minor changes not involving an adjustment to the Contract Price or Contract Time, Architect will issue instructions directly to Contractor.
- B. Architect will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time as authorized by the Conditions of the Contract by issuing supplemental instructions on AIA Form G710.
- C. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
 - 1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
 - 2. Promptly execute the change.
- D. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within ____ days.

- E. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation. Document any requested substitutions in accordance with Section 01 6000.
- F. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
 - 1. For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
 - 2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.
 - 3. For pre-determined unit prices and quantities, the amount will be based on the fixed unit prices.
- G. Substantiation of Costs: Provide full information required for evaluation.
 - 1. On request, provide the following data:
 - a. Quantities of products, labor, and equipment.
 - b. Taxes, insurance, and bonds.
 - c. Overhead and profit.
 - d. Justification for any change in Contract Time.
 - e. Credit for deletions from Contract, similarly documented.
 - 2. Support each claim for additional costs with additional information:
 - a. Origin and date of claim.
 - b. Dates and times work was performed, and by whom.
 - c. Time records and wage rates paid.
 - d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
 - 3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.
- H. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
- I. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.
- J. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.
- K. Promptly enter changes in Project Record Documents.

1.06 APPLICATION FOR FINAL PAYMENT

- A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- B. Application for Final Payment will not be considered until the following have been accomplished:
 - 1. All closeout procedures specified in Section 01 7000.
 - 2. Insurance certificates for products and completed operations where required and proof that taxes, fees and similar obligations were paid.
 - 3. Updated final statement, accounting for final changes to the Contract Sum.
 - 4. AIA Document G706, " Contractor's Affidavit of Payment of Debts and Claims."
 - 5. AIA Document G706A, " Contractor's Affidavit of Release of Liens."
 - 6. AIA Document G707, " Consent of Surety to Final Payment."
 - 7. Evidence that claims have been settled.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 2000

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**SECTION 01 2300
ALTERNATES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Description of Alternates.

1.02 RELATED REQUIREMENTS

- A Bid Form: Alternates on Bid Form.

1.03 ACCEPTANCE OF ALTERNATES

- A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option.
Accepted Alternates will be identified in the Owner-Contractor Agreement.

1.04 SCHEDULE OF ALTERNATES

- A. Alternate No. 1 - New Study Area as indicated on drawing sheet A102 and all related mechanical, electrical work.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 2300

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**SECTION 01 2500
SUBSTITUTION PROCEDURES**

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

2.01 GENERAL REQUIREMENTS

- A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
 - 2. Agrees to provide the same warranty for the substitution as for the specified product.
 - 3. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension that may subsequently become apparent.
- B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
- C. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
- D. Limit each request to a single proposed substitution item.

2.02 RESOLUTION

2.03 ACCEPTANCE

END OF SECTION 01 2500

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**SECTION 01 3000
ADMINISTRATIVE REQUIREMENTS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. General administrative requirements.
- B. Preconstruction meeting.
- C. Progress meetings.
- D. Construction progress schedule.
- E. Number of copies of submittals.
- F. Requests for Interpretation (RFI) procedures.
- G. Submittal procedures.

1.02 RELATED REQUIREMENTS

- A. Section 01 6000 - Product Requirements: General product requirements.

1.03 GENERAL ADMINISTRATIVE REQUIREMENTS

- A. Comply with requirements of Section 01 7000 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION****3.01 ELECTRONIC DOCUMENT SUBMITTAL**

- A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF) format that provides electronic stamping and signatures.
 - 1. Besides submittals for review, information, and closeout, this procedure applies to Requests for Interpretation (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
 - 2. Contractor and Architect are required to use this process.
 - 3. It is Contractor's responsibility to submit documents in allowable format.
 - 4. Users need an email address, Internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com)
 - 5. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.

3.02 PRECONSTRUCTION MEETING

- A. Attendance Required:
 - 1. Owner.
 - 2. Architect.
 - 3. Contractor.
 - 4. Major subcontractors.
- B. Agenda:
 - 1. Execution of Owner-Contractor Agreement.
 - 2. Submission of executed bonds and insurance certificates.
 - 3. Designation of personnel representing the parties to Contract and .
 - 4. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 - 5. Scheduling.

- C. Record minutes and distribute copies within three days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.

3.03 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the work at maximum bi-monthly intervals.
- B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required:
 - 1. Contractor.
 - 2. Owner.
 - 3. Architect.
 - 4. Contractor's superintendent.
 - 5. Major subcontractors.
- D. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of problems that impede, or will impede, planned progress.
 - 5. Review of submittals schedule and status of submittals.
 - 6. Maintenance of progress schedule.
 - 7. Corrective measures to regain projected schedules.
 - 8. Planned progress during succeeding work period.
 - 9. Maintenance of quality and work standards.
 - 10. Effect of proposed changes on progress schedule and coordination.
 - 11. Other business relating to work.
- E. Record minutes and distribute copies within three days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.

3.04 CONSTRUCTION PROGRESS SCHEDULE - SEE SECTION 01 3216

- A. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- B. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
 - 1. Include written certification that major contractors have reviewed and accepted proposed schedule.
- C. Within 10 days after joint review, submit complete schedule.
- D. Submit updated schedule at each Progress meeting.

3.05 REQUESTS FOR INFORMATION (RFI)

- A. Definition: A request seeking one of the following:
 - 1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
 - 2. A resolution to an issue which has arisen due to field conditions and affects design intent.
- B. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
 - 1. Prepare a separate RFI for each specific item.
 - a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.

- b. Do not forward requests which solely require internal coordination between subcontractors.
 2. Combine RFI and its attachments into a single electronic file. PDF format is preferred.
- C. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
 1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
 2. Unacceptable Uses for RFIs: Do not use RFIs to request the following:
 - a. Approval of submittals (use procedures specified elsewhere in this section).
 - b. Approval of substitutions (see Section - 01 6000 - Product Requirements)
 - c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
 - d. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).
 3. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
- D. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
 1. Official Project name and number, and any additional required identifiers established in Contract Documents.
 2. Owner's, Architect's, and Contractor's names.
 3. Discrete and consecutive RFI number, and descriptive subject/title.
 4. Issue date, and requested reply date.
 5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
 6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
 7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.
- E. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.
- F. Review Time: Architect will respond and return RFIs to Contractor within ten calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
- G. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.

3.06 NUMBER OF COPIES OF SUBMITTALS

- A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

3.07 SUBMITTAL PROCEDURES

- A. General Requirements:
 1. Use a single transmittal for related items.

2. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
 3. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
 4. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
 - a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
 5. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
 6. Provide space for Contractor and Architect review stamps.
 7. When revised for resubmission, identify all changes made since previous submission.
 8. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
 9. Submittals not requested will be recognized, and will be returned "Not Reviewed",
- B. Transmit each submittal with approved form.
- C. Contractor shall be responsible for submitting all documents in electronic (PDF) format and transmitted via email.
1. Provide electronic stamping and signatures.
 2. Beside submittal for review, information and closeout, this procedure applies to requests for information (RFI's), progress documentation, field reports and meeting minutes.
 3. Files shall be limited to 5 MB.
 4. File naming convention
 - a. The extension should be .pdf for Acrobat files.
 - b. The file name should be in the form of Division Number and Document Title.
 - 1) Example: 08 1113 Hollow Metal Doors and Frames
 5. No security features shall be enabled.
 6. Submittals containing information for more than one specification section shall have all sections identified on the transmittal according to the above numbering and name format.
- D. Apply Contractor's stamp, **signed or initialed** certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.
- E. Deliver submittals to Architect at the following email address.
1. submittals@martin-riley.com
 2. The use of Procore or similar software is not allowed.
- F. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
1. The review period will not be shortened for failure of the Contractor to anticipate construction schedule conflicts.
- G. Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents Submittals that are not required by the Contract Documents may be returned by the Architect without action.
- H. The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such

sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

- I. By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has:
 - 1. Reviewed and approved them.
 - 2. Determined and verified materials, field measurements and field construction criteria related thereto, or will do so.
 - 3. Checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.
- J. The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect.
- K. The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and:
 - 1. The Architect has given written approval to the specific deviation as a minor change in the Work.
 - 2. A Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.
- L. The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such written notice, the Architect's approval of a resubmission shall not apply to such revisions.

END OF SECTION 01 3000

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**SECTION 01 4000
QUALITY REQUIREMENTS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Quality assurance.
- B. Testing and inspection agencies and services.
- C. Control of installation.
- D. Defect Assessment.

1.02 RELATED REQUIREMENTS

- A. Document 00 7200 - General Conditions: Inspections and approvals required by public authorities.
- B. Section 01 3000 - Administrative Requirements: Submittal procedures.
- C. Section 01 4219 - Reference Standards.
- D. Section 01 6000 - Product Requirements: Requirements for material and product quality.

1.03 REFERENCE STANDARDS

- A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008 (Reapproved 2014).
- B. ASTM C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation; 2014.
- C. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2013.
- D. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2012a.
- E. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection and/or Testing; 2014a.
- F. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2013.
- G. ASTM E699 - Standard Specification for Agencies Involved in Testing, Quality Assurance, and Evaluating of Manufactured Building Components; 2016.
- H. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2010.

1.04 QUALITY ASSURANCE

- A. Testing Agency Qualifications:
 - 1. Prior to start of work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
 - 2. Qualification Statement: Provide documentation showing testing laboratory is accredited under IAS AC89.

1.05 REFERENCES AND STANDARDS - SEE SECTION 01 4219**1.06 TESTING AND INSPECTION AGENCIES AND SERVICES**

- A. Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.
- B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- C. Contractor Employed Agency:
 - 1. Testing agency: Comply with requirements of ASTM E329, ASTM E543, ASTM E699, ASTM C1021, ASTM C1077, ASTM C1093, and ASTM D3740.
 - 2. Laboratory Qualifications: Accredited by IAS according to IAS AC89.

3. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
4. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 TESTING AND INSPECTION

- A. Testing Agency Duties:
 1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 2. Perform specified sampling and testing of products in accordance with specified standards.
 3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
 5. Perform additional tests and inspections required by Architect.
 6. Submit reports of all tests/inspections specified.
- B. Limits on Testing/Inspection Agency Authority:
 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Agency may not approve or accept any portion of the Work.
 3. Agency may not assume any duties of Contractor.
 4. Agency has no authority to stop the Work.
- C. Contractor Responsibilities:
 1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
 2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
 3. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.

4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
 5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
 6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- D. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.
- E. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.03 DEFECT ASSESSMENT

- A. Replace Work or portions of the Work not complying with specified requirements.
- B. If, in the opinion of Architect, it is not practical to remove and replace the work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION 01 4000

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**SECTION 01 4219
REFERENCE STANDARDS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Requirements relating to referenced standards.
- B. Reference standards full title and edition date.

1.02 QUALITY ASSURANCE

- A. For products or workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Comply with the reference standard of date of issue specified in this section, except where a specific date is established by applicable code.
- C. Obtain copies of standards when required by the Contract Documents.
- D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Date of Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from the Architect before proceeding.
- F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Architect shall be altered by the Contract Documents by mention or inference otherwise in any reference document.

1.03 DEFINITIONS

- A. Definitions: Basic contract definitions are included in the Conditions of the Contract.
- B. "Indicated" refers to graphic representations, notes, or schedules on the Drawings, or other paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the reader locate the reference. Location is not limited.
- C. "Directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by the Architect, requested by the Architect, and similar phrases.
- D. "Approved," when used in conjunction with the Architect's action on the Contractor's submittals, applications, and requests, is limited to the Architect's duties and responsibilities as stated in the Conditions of the Contract.
- E. "Regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish" means supply and deliver to the Project Site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install" describes operations at the Project Site including the actual unloading, unpacking, assembly, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide" means to furnish and install, complete and ready for the intended use.
- I. "Installer" is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.
 - 1. The term "experienced," when used with the term "installer," means having a minimum of 5 previous projects similar in size and scope to this Project, being familiar with the special

requirements indicated, and having complied with requirements of authorities having jurisdiction.

- a. Using terms such as "carpentry" does not imply that certain work must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter."
2. Should the "Installer fail to meet the "experienced" requirements identified herein, the installer may request a waiver. Request for a waiver will be considered if received by the Architect at least two days prior to receipt of bids. The installer requesting a waiver must submit a letter which clearly states how the experience requirements cannot be met and shall be accompanied by a completed copy of the latest edition of AIA document A305: "Contractor's Qualification Statement". The Architect may request additional information necessary for evaluation. The Architect reserves the right to reject or accept any or all request to waive the "experienced" requirements.
- J. "Project Site" is the space available to the Contractor for performing construction activities, either exclusively or in conjunction, with others performing other work as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.
- K. "Testing Agencies": A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.
- L. Specification Format: These Specifications are organized into Divisions and Sections based on CSI's 48 Division MasterFormat numbering system.
 1. Abbreviated Language: Language used in Specifications is abbreviated. Implied words and meanings shall be interpreted as appropriate. Singular words will be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.
 2. Streamlined Language: The Specifications generally use the imperative mood and streamlined language. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.
 - a. The words "shall be" are implied where a colon (:) is used within a sentence or phrase.
- M. Copies of Standards: Copies of applicable standards are not bound with the Contract Documents. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source.
- N. Abbreviations and Names: Where acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-generating organization, authorities having jurisdiction, or other entity applicable to the context of the text provision. Refer to Gale Research Co.'s "Encyclopedia of Associations," available in most libraries.
- O. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established in conjunction with compliance with standards and regulations bearing upon performance of the Work.

PART 2 CONSTRUCTION INDUSTRY ORGANIZATION DOCUMENTS

2.01 AAMA -- AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION

- A. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document); 2015.

2.02 ACI -- AMERICAN CONCRETE INSTITUTE INTERNATIONAL

2.03 AHRI -- AIR-CONDITIONING, HEATING, AND REFRIGERATION INSTITUTE

2.04 AIA -- THE AMERICAN INSTITUTE OF ARCHITECTS

- A. AIA A310 - Bid Bond; 2010.
- B. AIA A312 - Performance Bond and Payment Bond; 2010.
- C. AIA A503-2007 - Guide for Supplementary Conditions; 2007.
- D. AIA G701-2001 - Change Order; 2001.
- E. AIA G702 - Application and Certificate for Payment; 1992.
- F. AIA G703 - Continuation Sheet; 1992.
- G. AIA G704 - Certificate of Substantial Completion; 2000.
- H. AIA G709-2001 - Proposal Request; 2001.

2.05 AISI -- AMERICAN IRON AND STEEL INSTITUTE

2.06 AMCA -- AIR MOVEMENT AND CONTROL ASSOCIATION INTERNATIONAL, INC.

2.07 ASHRAE -- AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS, INC.

2.08 ASSE -- AMERICAN SOCIETY OF SANITARY ENGINEERING

2.09 ASTM G SERIES -- ASTM INTERNATIONAL

2.10 AWC -- AMERICAN WOOD COUNCIL

2.11 AWPA -- AMERICAN WOOD-PRESERVERS' ASSOCIATION

2.12 AWS -- AMERICAN WELDING SOCIETY

2.13 AWWA -- AMERICAN WATER WORKS ASSOCIATION

2.14 BIA -- BRICK INDUSTRY ASSOCIATION

2.15 CARB -- CALIFORNIA AIR RESOURCES BOARD

2.16 CRI -- CARPET AND RUG INSTITUTE

2.17 EIA -- ELECTRONIC INDUSTRIES ALLIANCE

2.18 FM -- FACTORY MUTUAL GLOBAL

2.19 GA -- GYPSUM ASSOCIATION

- A. GA-216 - Application and Finishing of Gypsum Board; 2013.

2.20 GANA -- GLASS ASSOCIATION OF NORTH AMERICA

2.21 GREENSEAL -- GREEN SEAL, INC.

- A. GreenSeal GS-36 - Commercial Adhesives; 2011.

2.22 IAS -- INTERNATIONAL ACCREDITATION SERVICE

- A. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2010.

- 2.23 IEC -- INTERNATIONAL ELECTROTECHNICAL COMMISSION**
 - 2.24 IEEE -- INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS**
 - 2.25 IES/IESNA -- ILLUMINATING ENGINEERING SOCIETY**
 - 2.26 ITS -- INTERTEK TESTING SERVICES NA, INC.**
 - 2.27 MFMA -- METAL FRAMING MANUFACTURERS ASSOCIATION**
 - 2.28 MPI -- MASTER PAINTERS INSTITUTE (MASTER PAINTERS AND DECORATORS ASSOCIATION)**
 - 2.29 MSS -- MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY, INC.**
 - 2.30 NEMA -- NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION**
 - 2.31 NFPA -- NATIONAL FIRE PROTECTION ASSOCIATION**
 - A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.
 - B. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2015.
 - 2.32 NFRC -- NATIONAL FENESTRATION RATING COUNCIL, INC.**
 - 2.33 NSF -- NSF INTERNATIONAL (THE PUBLIC HEALTH AND SAFETY ORGANIZATION)**
 - 2.34 NWWDA -- NATIONAL WOOD WINDOW AND DOOR ASSOCIATION (NAME CHANGED TO WDMA)**
 - 2.35 SMACNA -- SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION, INC.**
 - 2.36 SPIB -- SOUTHERN PINE INSPECTION BUREAU, INC.**
 - A. SPIB (GR) - Grading Rules; 2014.
 - 2.37 SSPC -- SOCIETY FOR PROTECTIVE COATINGS**
 - 2.38 TIA -- TELECOMMUNICATIONS INDUSTRY ASSOCIATION**
 - 2.39 UL -- UNDERWRITERS LABORATORIES INC.**
 - 2.40 ULC -- UNDERWRITERS' LABORATORIES OF CANADA**
 - 2.41 WCMA -- WINDOW COVERING MANUFACTURERS ASSOCIATION**
 - A. WCMA A100.1 - Safety of Corded Window Covering Products; Current Edition, Including All Revisions.
 - 2.42 WI -- WOODWORK INSTITUTE**
- PART 3 UNITED STATES GOVERNMENT AND RELATED AGENCIES DOCUMENTS**
- 3.01 FS -- FEDERAL SPECIFICATIONS AND STANDARDS (GENERAL SERVICES ADMINISTRATION)**

END OF SECTION 01 4219

**SECTION 01 5100
TEMPORARY UTILITIES**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Temporary Utilities: Provision of electricity, lighting, heat, ventilation, and water.

1.02 RELATED REQUIREMENTS

- A. Section 01 5000 - Temporary Facilities and Controls:

1.03 TEMPORARY ELECTRICITY

- A. Feeder Service Characteristics: 120 volt, 30 ampere, signal phase, three wire.
- B. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required. Provide flexible power cords as required.
- C. Provide feeder switch at source distribution equipment and meter.
- D. Permanent convenience receptacles may not be utilized during construction.
- E. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting.

1.04 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

- A. Provide and maintain LED, compact fluorescent, or high-intensity discharge lighting as suitable for the application for construction operations in accordance with requirements of 29 CFR 1926 and authorities having jurisdiction.
- B. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
- C. Maintain lighting and provide routine repairs.

1.05 TEMPORARY HEATING

- A. Provide heating devices and heat as needed to maintain specified conditions for construction operations.
- B. Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.

1.06 TEMPORARY COOLING

- A. Provide cooling devices and cooling as needed to maintain specified conditions for construction operations.
- B. Maintain maximum ambient temperature of 80 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.

1.07 TEMPORARY VENTILATION

- A. Existing ventilation equipment may not be used.

1.08 TEMPORARY WATER SERVICE

- A. Connect to existing water source.
 - 1. Exercise measures to conserve water.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION - NOT USED**

END OF SECTION 01 5100

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**SECTION 01 5500
VEHICULAR ACCESS AND PARKING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Access roads.
- B. Haul routes.
- C. Maintenance.
- D. Removal, repair.
- E. Mud from site vehicles.

PART 3 EXECUTION

2.01 ACCESS ROADS

- A. Use of existing on-site streets and driveways for construction traffic is permitted.
- B. Tracked vehicles not allowed on paved areas.
- C. Provide unimpeded access for emergency vehicles. Maintain 20 foot width driveways with turning space between and around combustible materials.
- D. Provide and maintain access to fire hydrants free of obstructions.

2.02 HAUL ROUTES

- A. Consult with authority having jurisdiction, establish public thoroughfares to be used for haul routes and site access.

2.03 MAINTENANCE

- A. Maintain traffic and parking areas in a sound condition free of excavated material, construction equipment, products, mud, snow, and ice.
- B. Maintain existing paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.

2.04 REMOVAL, REPAIR

- A. Repair existing facilities damaged by use, to original condition.
- B. Remove equipment and devices when no longer required.
- C. Repair damage caused by installation.

2.05 MUD FROM SITE VEHICLES

- A. Provide means of removing mud from vehicle wheels before entering streets.

END OF SECTION 01 5500

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**SECTION 01 6000
PRODUCT REQUIREMENTS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. General product requirements.
- B. Re-use of existing products.
- C. Transportation, handling, storage and protection.
- D. Product option requirements.
- E. Substitution limitations.
- F. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

- A. Section 01 2500 - Substitution Procedures: Substitutions made during procurement and/or construction phases.
- B. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.
- C. Section 01 7419 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging and substitutions.

1.03 SUBMITTALS

- A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.
- D. Indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

PART 2 PRODUCTS**2.01 EXISTING PRODUCTS**

- A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.
- B. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

2.02 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by the Contract Documents.
- B. Use of products having any of the following characteristics is not permitted:
 - 1. Made using or containing CFC's or HCFC's.
 - 2. Containing lead, cadmium, or asbestos.
- C. Where other criteria are met, Contractor shall give preference to products that:
 - 1. If used on interior, have lower emissions, as defined in Section 01 6116.
 - 2. If wet-applied, have lower VOC content, as defined in Section 01 6116.
 - 3. Have longer documented life span under normal use.

4. Result in less construction waste. See Section 01 7419
5. Are made of recycled materials.

2.03 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.
- D. Products specified as "Basis of Design": The product has been selected as an example and standard of the performance, appearance, or function desired, or for one or more other reasons. The product named is used as the basis of comparison of other products which may be proposed or submitted for review. In some cases, other details or construction assemblies are based on the characteristics of the product named. Products named in addition to the Basis of Design product must still comply with other technical criteria and requirements listed.

2.04 MAINTENANCE MATERIALS

- A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
- B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

- A. See Section 01 2500 - Substitution Procedures.

3.02 TRANSPORTATION AND HANDLING

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- D. Transport and handle products in accordance with manufacturer's instructions.
- E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
- H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION

- A. Provide protection of stored materials and products against theft, casualty, or deterioration.
- B. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 01 7419.
- C. Store and protect products in accordance with manufacturers' instructions.
- D. Store with seals and labels intact and legible.
- E. Arrange storage of materials and products to allow for visual inspection for the purpose of determination of quantities, amounts, and unit counts.

- F. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.
- G. For exterior storage of fabricated products, place on sloped supports above ground.
- H. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- I. Comply with manufacturer's warranty conditions, if any.
- J. Do not store products directly on the ground.
- K. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- L. Prevent contact with material that may cause corrosion, discoloration, or staining.
- M. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- N. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION 01 6000

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**SECTION 01 6116
VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Requirements for VOC-Content-Restricted products.
- B. Requirement for installer certification that they did not use any non-compliant products.
- C. VOC restrictions for product categories listed below under "DEFINITIONS."
- D. All products of each category that are installed in the project must comply; Owner's project goals do not allow for partial compliance.

1.02 RELATED REQUIREMENTS

- A. Section 01 3000 - Administrative Requirements: Submittal procedures.
- B. Section 01 3329.07 - Prohibited Content Installer Certification: Form for certifying that no non-compliant products were used.

1.03 DEFINITIONS

- A. VOC-Content-Restricted Products: All products in the following product categories, whether specified or not:
 - 1. Interior paints and coatings applied on site.
 - 2. Interior adhesives and sealants applied on site, including flooring adhesives.
- B. VOC-Restricted Products: All products of each of the following categories when installed or applied on-site in the building interior:
 - 1. Adhesives, sealants, and sealer coatings.
 - 2. Paints and coatings.
 - 3. Insulation.
 - 4. Gypsum board.
- C. Interior of Building: Anywhere inside the exterior weather barrier.
- D. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- E. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Evidence of Compliance: Submit for each different product in each applicable category.
- C. Product Data: For each VOC-restricted product used in the project, submit evidence of compliance.
- D. Installer Certifications Regarding Prohibited Content: Require each installer of any type of product (not just the products for which VOC restrictions are specified) to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of installer's products, or 2) that such products used comply with these requirements.

1.05 QUALITY ASSURANCE

- A. VOC Content Test Method: 40 CFR 59, Subpart D (EPA Method 24), or ASTM D3960, unless otherwise indicated.
 - 1. Evidence of Compliance: Acceptable types of evidence are:
 - a. Report of laboratory testing performed in accordance with requirements.
- B. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

1.06 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 PRODUCTS

2.01 MATERIALS

- A. All Products: Comply with the most stringent of federal, State, and local requirements, or these specifications.
- B. VOC-Content-Restricted Products: VOC content not greater than required by the following:
 - 1. Adhesives, Including Flooring Adhesives: SCAQMD 1168 Rule.
 - 2. Joint Sealants: SCAQMD 1168 Rule.
 - 3. Paints and Coatings: Each color; most stringent of the following:
 - a. 40 CFR 59, Subpart D.
 - b. SCAQMD 1113 Rule.
 - c. CARB (SCM).
- C. Adhesives and Joint Sealants: Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168.
 - 1. Evidence of Compliance: Acceptable types of evidence are:
 - a. Report of laboratory testing performed in accordance with requirements.
- D. Aerosol Adhesives: Provide only products having volatile organic compound (VOC) content not greater than required by GreenSeal GS-36.
 - 1. Evidence of Compliance: Acceptable types of evidence are:
 - a. Current GreenSeal Certification.

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

- A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.
- B. Additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Contractor.

END OF SECTION 01 6116

**SECTION 01 7000
EXECUTION AND CLOSEOUT REQUIREMENTS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Examination, preparation, and general installation procedures.
- B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.
- C. Pre-installation meetings.
- D. Cutting and patching.
- E. Surveying for laying out the work.
- F. Cleaning and protection.
- G. Starting of systems and equipment.
- H. Demonstration and instruction of Owner personnel.
- I. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.
- J. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

- A. Section 01 1000 - SUMMARY: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.
- B. Section 01 3000 - Administrative Requirements: Submittals procedures, Electronic document submittal service.
- C. Section 01 4000 - Quality Requirements: Testing and inspection procedures.
- D. Section 01 5000 - Temporary Facilities and Controls: Temporary interior partitions.
- E. Section 01 5100 - Temporary Utilities: Temporary heating, cooling, and ventilating facilities.
- F. Section 01 7800 - Closeout Submittals: Project record documents, operation and maintenance data, warranties, and bonds.
- G. Section 07 8400 - Firestopping.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
 - 1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences. Include design drawings and calculations for bracing and shoring.
 - 2. Identify demolition firm and submit qualifications.
 - 3. Include a summary of safety procedures.
- C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
 - 1. Structural integrity of any element of Project.
 - a. Do not cut and patch structural elements in a manner that could change their load supporting capacity or load deflection ratio.
 - 2. Integrity of weather exposed or moisture resistant element.
 - 3. Efficiency, maintenance, or safety of any operational element.
 - a. 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.
 - 4. Visual qualities of sight exposed elements.

- a. 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 the Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- 5. Work of Owner or separate Contractor.
- 6. Include in request:
 - a. Identification of Project.
 - b. Location and description of affected work.
 - c. Necessity for cutting or alteration.
 - d. Description of proposed work and products to be used.
 - e. Effect on work of Owner or separate Contractor.
 - f. Written permission of affected separate Contractor.
 - g. Date and time work will be executed.
- D. Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.
- E. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.04 QUALIFICATIONS

- A. For demolition work, employ a firm specializing in the type of work required.
- B. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in Wisconsin. Employ only individual(s) trained and experienced in establishing and maintaining horizontal and vertical control points necessary for laying out construction work on project of similar size, scope and/or complexity.
- C. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in Wisconsin.

1.05 PROJECT CONDITIONS

- A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- D. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
- E. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
 - 1. Comply with applicable local and State ordinances and codes.
 - 2. Develop and submit to authorities having jurisdiction written erosion control plan, if applicable.
- F. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
- G. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

1.06 COORDINATION

- A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Notify affected utility companies and comply with their requirements.

- C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- F. Coordinate completion and clean-up of work of separate sections.
- G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

- A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Architect seven days in advance of meeting date.

- D. Prepare agenda and preside at meeting:
 - 1. Review conditions of examination, preparation and installation procedures.
 - 2. Review coordination with related work.
- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify Architect of any discrepancies discovered.
- C. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- D. Utilize recognized engineering survey practices.
- E. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
 - 1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
 - 2. Grid or axis for structures.
 - 3. Building foundation, column locations, ground floor elevations.
- F. Periodically verify layouts by same means.
- G. Maintain a complete and accurate log of control and survey work as it progresses.

3.05 GENERAL INSTALLATION REQUIREMENTS

- A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 ALTERATIONS

- A. Drawings showing existing construction and utilities are based on the best information available. Do not rely on drawings for locations of existing site improvements.
 - 1. Verify that construction and utility arrangements are as indicated.
 - 2. Report discrepancies to Architect before disturbing existing installation.
 - 3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
 - 1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.
 - 2. Insulate existing ducts or pipes that are exposed to outdoor ambient temperatures by alterations work.
- C. Remove existing work as indicated and as required to accomplish new work.
 - 1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
 - 2. Remove items indicated on drawings.
 - 3. Relocate items indicated on drawings.
 - 4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.

5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
- D. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, Telecommunications, and Fiber Optics): Remove, relocate, and extend existing systems to accommodate new construction.
 1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
 2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
 3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 - a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
 - b. Provide temporary connections as required to maintain existing systems in service.
 4. Verify that abandoned services serve only abandoned facilities.
 5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.
- E. Protect existing work to remain.
 1. Prevent movement of structure; provide shoring and bracing if necessary.
 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 3. Repair adjacent construction and finishes damaged during removal work.
- F. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
 1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
- G. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.
- H. Refinish existing surfaces as indicated:
 1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
 2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.
- I. Clean existing systems and equipment.
- J. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.
- K. Do not begin new construction in alterations areas before demolition is complete.
- L. Comply with all other applicable requirements of this section.

3.07 CUTTING AND PATCHING

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. See Alterations article above for additional requirements.
- C. Perform whatever cutting and patching is necessary to:
 1. Complete the work.
 2. Fit products together to integrate with other work.

3. Provide openings for penetration of mechanical, electrical, and other services.
 4. Match work that has been cut to adjacent work.
 5. Repair areas adjacent to cuts to required condition.
 6. Repair new work damaged by subsequent work.
 7. Remove samples of installed work for testing when requested.
 8. Remove and replace defective and non-complying work.
- D. Execute cutting and patching including excavation and fill to complete the work, to uncover work in order to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit products together to integrate with other work.
- E. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- F. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- G. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- H. Restore work with new products in accordance with requirements of Contract Documents.
- I. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- J. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 8400, to full thickness of the penetrated element.
- K. Patching:
1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
 2. Match color, texture, and appearance.
 3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.
- L. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
- M. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.
- N. Patch or replace surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. Repair substrate prior to patching finish. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.08 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.09 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.10 SYSTEM STARTUP

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Architect and Owner seven days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
- G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.11 DEMONSTRATION AND INSTRUCTION

- A. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.
- B. For equipment or systems requiring seasonal operation, perform demonstration for other season within twelve months.
- C. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of Owner's personnel.
- D. The amount of time required for instruction on each item of equipment and system is that specified in individual sections.

3.12 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.
- B. Testing, adjusting, and balancing HVAC systems: See Section 23 0593 - Testing, Adjusting, and Balancing for HVAC.

3.13 FINAL CLEANING

- A. Use cleaning materials that are nonhazardous.
- B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

- C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
- D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- E. Clean filters of operating equipment.
- F. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and drainage systems.
- G. Clean site; sweep paved areas, rake clean landscaped surfaces.
- H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.14 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities.
 - 1. Provide copies to Architect.
- B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.
- C. Notify Architect when work is considered ready for Substantial Completion.
 - 1. Preliminary Procedures: Before requesting final verification for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
 - a. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - b. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 - c. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 - 2. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
 - a. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
 - b. Results of completed inspection will form the basis of requirements for Final Completion.
- D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.
- E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.
- F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.
- G. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.
 - 1. Preliminary Procedures: Before requesting final verification of compliance for determining date of Final Completion, complete the following:

- a. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
 - b. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 - c. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 - d. Submit a statement, accounting for changes to the Contract Sum.
 - e. Submit consent of surety to final payment.
 - f. Submit waivers of liens from subcontractors and material suppliers.
 - g. Submit record drawings, maintenance manuals, final project photographs, damage or settlement surveys, property surveys and similar final record information.
 - h. Submit sworn affidavit stating that no material containing asbestos or polychlorinated biphenyl (PCB) were used or installed under this project.
 - i. Complete final cleanup requirements, including touchup painting.
- H. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

3.15 MAINTENANCE

- A. Provide service and maintenance of components indicated in specification sections.
- B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.
- C. Furnish service and maintenance of components indicated in specification sections during the warranty period.
- D. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- E. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- F. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION 01 7000

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**SECTION 01 7800
CLOSEOUT SUBMITTALS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Project Record Documents.
- B. Closeout Release Documents.
- C. Operation and Maintenance Data.
- D. Warranties and bonds.

1.02 RELATED REQUIREMENTS

- A. Section 01 3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- B. Individual Product Sections: Specific requirements for operation and maintenance data.
- C. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

- A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
 - 1. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
 - 2. Final Submission: Submit one full size set of revised final documents in final form within 10 days after final inspection.
 - a. Submit one electronic set in the form of pdf documents.
- B. Closeout Release Documents:
 - 1. Asbestos and or polychlorinated biphenyl (PCB) Affidavit. Each contractor shall furnish to the Owner and Architect a sworn affidavit stating that materials used under this contract did not contain asbestos or polychlorinated biphenyl (PCB).
- C. Operation and Maintenance Data:
 - 1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
 - 2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
 - 3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
 - 4. Submit two sets of revised final documents in final form within 10 days after final inspection.
- D. Warranties and Bonds:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
 - 2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION****3.01 PROJECT RECORD DOCUMENTS**

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:

1. Drawings.
 2. Specifications.
 3. Addenda.
 4. Change Orders and other modifications to the Contract.
 5. Reviewed shop drawings, product data, and samples.
 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
1. Changes made by Addenda and modifications.
- F. Record Drawings and Shop Drawings : Legibly mark each item to record actual construction including:
1. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 3. Field changes of dimension and detail.
 4. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

- A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
- D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

- A. For Each Product, Applied Material, and Finish:
- B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- C. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. For Each Item of Equipment and Each System:
1. Description of unit or system, and component parts.
 2. Identify function, normal operating characteristics, and limiting conditions.
 3. Include performance curves, with engineering data and tests.
 4. Complete nomenclature and model number of replaceable parts.
- B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

- C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
- D. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- F. Provide servicing and lubrication schedule, and list of lubricants required.
- G. Include manufacturer's printed operation and maintenance instructions.
- H. Include sequence of operation by controls manufacturer.
- I. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- K. Include test and balancing reports.
- L. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

- A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.
- B. Where systems involve more than one specification section, provide separate tabbed divider for each system.
- C. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
- D. Prepare data in the form of an instructional manual.
- E. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
- F. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- G. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.
- H. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.
- I. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.
- J. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.
- K. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

3.06 WARRANTIES AND BONDS

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.

- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.

END OF SECTION 01 7800

**SECTION 02 4100
DEMOLITION****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Building demolition excluding removal of hazardous materials and toxic substances.
- B. Selective demolition of building elements for alteration purposes.

1.02 RELATED REQUIREMENTS

- A. Section 00 3100 - Available Project Information: Existing building survey conducted by Owner; information about known hazardous materials.
- B. Section 01 1000 - SUMMARY: Limitations on Contractor's use of site and premises.
- C. Section 01 1000 - SUMMARY: Description of items to be salvaged or removed for re-use by Contractor.
- D. Section 01 5000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
- E. Section 01 6000 - Product Requirements: Handling and storage of items removed for salvage and relocation.
- F. Section 01 7000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.
- G. Section 31 2200 - Grading: Fill material for filling holes, pits, and excavations generated as a result of removal operations.
- H. Section 31 2323 - Fill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

PART 2 PRODUCTS**2.01 MATERIALS**

- A. Fill Material: As specified in Section 31 2323 - Fill.

PART 3 EXECUTION**3.01 SCOPE**

- A. Remove the entire building designated Office Area.
- B. Remove paving as indicated on demolition drawing(s)..
- C. Remove other items indicated, for salvage, relocation, recycling, and reinstallation.
- D. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in Section 31 2200.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. Comply with other requirements specified in Section 01 7000.
- B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
 - 1. Obtain required permits.
 - 2. Comply with applicable requirements of NFPA 241.
 - 3. Use of explosives is not permitted.
 - 4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
 - 5. Provide, erect, and maintain temporary barriers and security devices.
 - 6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.

7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 8. Do not close or obstruct roadways or sidewalks without permit.
 9. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
 10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
- C. Do not begin removal until receipt of notification to proceed from Owner.
 - D. Do not begin removal until built elements to be salvaged or relocated have been removed.
 - E. Do not begin removal until vegetation to be relocated has been removed and specified measures have been taken to protect vegetation to remain.
 - F. Protect existing structures and other elements that are not to be removed.
 1. Provide bracing and shoring.
 2. Prevent movement or settlement of adjacent structures.
 3. Stop work immediately if adjacent structures appear to be in danger.
 - G. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
 - H. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.
 - I. Perform demolition in a manner that maximizes salvage and recycling of materials.
 1. Dismantle existing construction and separate materials.
 2. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

3.03 EXISTING UTILITIES

- A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.
- E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.
- F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
- G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

3.04 SELECTIVE DEMOLITION FOR ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
 1. Verify that construction and utility arrangements are as indicated.
 2. Report discrepancies to Architect before disturbing existing installation.
 3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
- B. Remove existing work as indicated and as required to accomplish new work.
 1. Remove items indicated on drawings.

- C. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, Telecommunications, and _____): Remove existing systems and equipment as indicated.
 - 1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
 - 2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 - 3. Verify that abandoned services serve only abandoned facilities before removal.
 - 4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.
- D. Protect existing work to remain.
 - 1. Prevent movement of structure; provide shoring and bracing if necessary.
 - 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 - 3. Repair adjacent construction and finishes damaged during removal work.
 - 4. Patch as specified for patching new work.

3.05 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Leave site in clean condition, ready for subsequent work.
- C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION 02 4100

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**SECTION 06 1000
ROUGH CARPENTRY**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Structural dimension lumber framing.
- B. Miscellaneous framing and sheathing.
- C. Communications and electrical room mounting boards.
- D. Concealed wood blocking, nailers, and supports.

1.02 RELATED REQUIREMENTS

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 03 3000 - Cast-in-Place Concrete: Setting anchors in masonry.
- C. Section 07 2500 - Weather Barriers: Air barrier over sheathing.
- D. Section 07 2500 - Weather Barriers: Water-resistive barrier over sheathing.
- E. Section 07 6200 - Sheet Metal Flashing and Trim: Including counterflashings, fascia and coping.
- F. Section 07 6200 - Sheet Metal Flashing and Trim: Sill flashings.
- G. Section 09 2116 - Gypsum Board Assemblies: Gypsum-based sheathing.

1.03 REFERENCE STANDARDS

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- C. PS 1 - Structural Plywood; 2009.
- D. PS 20 - American Softwood Lumber Standard; 2010.
- E. SPIB (GR) - Grading Rules; 2014.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide technical data on insulated sheathing, wood preservative materials, and application instructions.
- C. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

PART 2 PRODUCTS**2.01 GENERAL REQUIREMENTS**

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
 - 1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
 - 2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

- B. Lumber fabricated from old growth timber is not permitted.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

- A. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).
- B. Sizes: Nominal sizes as indicated on drawings, S4S.
- C. Moisture Content: S-dry or MC19.
- D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
 - 1. Lumber: S4S, No. 2 or Standard Grade.

2.03 STRUCTURAL PANELS

- A. Roof Sheathing, For Restroom cap: Any PS 1 type, rated Structural 1 Sheathing.
 - 1. Material: Plywood.
 - 2. Edges: Tongue and Groove.
 - 3. Bond Classification: Exterior.
 - 4. Span Rating: 24/16
 - 5. A-D plywood; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
- B. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
- C. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
- D. Concealed Plywood for Roofing Applications:
 - 1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
 - a. Thickness indicated but not less than 1/2 inch nominal.

2.04 ACCESSORIES

- A. Fasteners and Anchors:
 - 1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
- B. Sill Gasket on Top of Foundation Wall: 1/4 inch thick, plate width, closed cell plastic foam from continuous rolls. Provide _____ manufactured by _____ .
- C. Sill Flashing: As specified in Section 07 6200.
- D. Water-Resistive Barrier: As specified in Section 07 2500.

2.05 FACTORY WOOD TREATMENT

- A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
 - 1. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.
- B. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative.
 - 1. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
 - 2. Treat lumber in contact with roofing, flashing, or waterproofing.
 - 3. Treat lumber in contact with masonry or concrete.

PART 3 EXECUTION

3.01 PREPARATION

- A. Install sill gasket under sill plate of framed walls bearing on foundations; puncture gasket cleanly to fit tightly around protruding anchor bolts.

3.02 INSTALLATION - GENERAL

- A. Select material sizes to minimize waste.
- B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
- C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 BLOCKING, NAILERS, AND SUPPORTS

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
- B. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.
- C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
- D. Provide the following specific non-structural framing and blocking:
 - 1. Cabinets and shelf supports.
 - 2. Wall brackets.
 - 3. Handrails.
 - 4. Grab bars.
 - 5. Towel and bath accessories.
 - 6. Wall-mounted door stops.
 - 7. Chalkboards and marker boards.
 - 8. Joints of rigid wall coverings that occur between studs.

3.04 ROOF-RELATED CARPENTRY

- A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.
- B. Cut and fit miscellaneous carpentry accurately and securely fasten. Install members plumb and true to line and level.
- C. Install perimeter wood nailers true to line and level, with the outside edge of wood nailer aligned flush with outermost wall face. Comply with recommendations of National Roofing Contractors Association (NRCA) "Roofing and Waterproofing Manual", third edition.
- D. Install perimeter wood nailers as recommended "Low Slope membrane edge securement, except gutter, shall be designated, tested and installed for Building Code wind load requirements, and tested for resistance in accordance with ANSI/SPRI ES-1.
- E. Install wood grounds, nailers, blocking, and sleepers where shown and where required for screeding or attachment of other work as follows:
- F. Wood nailers installed at building corners (with corners being defined as the distance from the building corner that is 10% of the minimum building width or 40% of the building height at the eaves, whichever is smaller, but in case less than 3 feet) are to be installed and secured so that basic attachment is sufficient enough to resist a minimum of 200 pounds per foot force.
- G. Wood nailers installed at perimeter sections of the roof edge located between the corners, are to be installed and secured so that the basic attachment is sufficient enough to resist a minimum of 100 pounds per foot force.

- H. Blocking at all edge conditions should be a minimum thickness of 1.5 inches and be sufficient width to extend at least 1/2 inch minimum beyond the nailing flange of the roof edge flashing.
- I. Install fasteners without splitting wood blocking.
- J. Fasten wood blocking to allow for expansion at joints, unless otherwise noted.
- K. Wood blocking secured to either masonry, steel or additional wood members as follows:
 - 1. Masonry: when the bottom nailer is to be installed in direct contact with masonry, the nailer is to be secured with a corrosion resistant anchor bolt, countersunk into nailer and attached to nailer with a nut and washer. Anchor bolts should be a minimum 1/2 inch in diameter and spaced 4 feet c/c max. apart. If nailer is larger than 6 inches, then anchor bolts should be staggered to avoid splitting the wood. Anchors are to be bent 90 degrees at the base or have heads designed to prevent rotation and slipping out. When securing nailers to hollow block masonry at roof line, fill cores or voids in the top row with full density concrete.
 - 2. Steel deck: when bottom nailer is anchored directly to steel, a steel angle needs to be installed. Nailer is anchored to steel with corrosion resistant anchor bolts, minimum 1/2 inch in diameter and spaced 4 foot center to center maximum. When the deck is a minimum 22 ga steel, the angle should be secured to the deck with fasteners having a minimum 360 pound pull out rating. Fasteners for steel angle are to be installed on maximum 12 inch centers with a minimum 5/8 inch diameter washer under the screw heads.
 - 3. Additional Wood Blocking: when additional wood blocking is stacked onto new or existing blocking, the securement of the blocking that is being anchored too should be verified for proper securement. Additional stacked wood blocking onto existing blocking properly secured, should be fastened with corrosion resistant screws having a pull-out resistance of at least 360 pounds per fastener. Screws are to be staggered and spaced a maximum 12-inches center to center. Screws in corners are to be staggered and spaced 6-inches maximum center to center.
 - 4. Concrete and Gypsum Decks: Wood blocking is not to be fastened directly to concrete or gypsum decks. Wood blocking needs to be installed directly to wall structure.

3.05 CLEANING

- A. Waste Disposal: Comply with the requirements of Section 01 7419 - Construction Waste Management and Disposal.
 - 1. Comply with applicable regulations.
 - 2. Do not burn scrap on project site.
 - 3. Do not burn scraps that have been pressure treated.
 - 4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or "waste-to-energy" facilities.
- B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.
- C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION 06 1000

**SECTION 07 8400
FIRESTOPPING****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Firestopping systems.
- B. Firestopping of all joints and penetrations in fire resistance rated and smoke resistant assemblies, whether indicated on drawings or not, and other openings indicated.

1.02 RELATED REQUIREMENTS

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 01 7000 - Execution and Closeout Requirements: Cutting and patching.
- C. Section 09 2116 - Gypsum Board Assemblies: Gypsum wallboard fireproofing.

1.03 REFERENCE STANDARDS

- A. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2024.
- B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2024.
- C. FM (AG) - FM Approval Guide; Current Edition.
- D. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition.
- E. UL (FRD) - Fire Resistance Directory; current edition.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Schedule of Firestopping: List each type of penetration, perimeter and joint, fire rating of the assembly, and firestopping test or design number.
- C. Product Data: Provide data on product characteristics.
- D. Submit material safety data sheets (MSDS) for product used on the project.
- E. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- G. Manufacturer's engineering judgment identification number and document details when no qualified tested system is available for an application. Engineering judgment must include both project name and contractor's name who will install firestop system as described in document.
- H. Contractor to submit FM 4991 or UL Accredited Certificate from qualified installer.
- I. Manufacturer to provide and contractor to submit firestop training letter.

1.05 QUALITY ASSURANCE

- A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
 - 1. Listing in UL (FRD), FM (AG), or ITS (DIR) will be considered as constituting an acceptable test report.
- B. Engineering Judgment: For those firestop applications that exist for which no qualified tested system is available through a manufacturer, an engineering judgment derived from similar qualified tested system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineering judgment documents must follow requirements set forth by the International Firestop Council.
- C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- D. Installer Qualifications: Company specializing in performing the work of this section and:

1. UL Approved Contractor
2. Approved by Factory Mutual Research Corporation under FM 4991.
3. Verification of minimum three years documented experience installing work of this type.
4. Verification of at least five satisfactorily completed projects of comparable size and type.
5. Licensed by local authorities having jurisdiction (AHJ).

1.06 FIELD CONDITIONS

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for recommended number of days after installation of materials.
- B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.

2.02 FIRESTOPPING FOR FLOOR-TO-FLOOR, WALL-TO-FLOOR, AND WALL-TO-WALL JOINTS

- A. Concrete and Concrete Masonry Walls and Floors:
 1. Concrete/Concrete Masonry Wall to Wall Joint Systems That Have Movement Capabilities (Dynamic):
 - a. 3 Hour Construction: UL System WW-D-1001; Specified Technologies Inc. SIL silicone sealant.
 - b. 3 Hour Construction: UL System WW-D-1007; Specified Technologies Inc. ES Elastomeric Firestop Sealant.
 - c. 3 Hour Construction: UL System WW-D-1037; Specified Technologies Inc. AS200 Elastomeric Spray.
 - d. 2 Hour Construction: UL System WW-D-1077; Tremco, TREMstop Acrylic Firestop Sealant.
 - e. 2 Hour Construction: UL System WW-D-0032; Hilti CP 606 Flexible Firestop Sealant.

2.03 FIRESTOPPING PENETRATIONS THROUGH CONCRETE AND CONCRETE MASONRY CONSTRUCTION

- A. Penetrations Through Floors or Walls By:
 1. Multiple Penetrations in Large Openings:
 - a. 3 Hour Construction: UL System C-AJ-8016; Specified Technologies Inc. SSM mortar.
 - b. 3 Hour Construction: UL System C-AJ-8093; Specified Technologies Inc. SSB Intumescent Firestop pillows.
 - c. 3 Hour Construction: UL System C-AJ-8181; Specified Technologies Inc. Composite Sheet.
 - d. 3 Hour Construction: UL System C-AJ-8099; Hilti FS-ONE MAX Intumescent Firestop Sealant.
 - e. 3 Hour Construction: UL System C-AJ-8110; Hilti CFS-BL Firestop Block.
 - f. 2 Hour Construction: UL System C-AJ-8143; Hilti FS-ONE MAX Intumescent Firestop Sealant.
 - g. 2 Hour Construction: UL System C-AJ-8055; Specified Technologies Inc. SSP Firestop Putty.
 - h. 2 Hour Construction: UL System C-AJ-8093; Specified Technologies Inc. SSB Intumescent Firestop pillows.
 - i. 2 Hour Construction: UL System C-AJ-8181; Specified Technologies Inc. Composite Sheet.
 2. Uninsulated Metallic Pipe, Conduit, and Tubing:
 - a. 3 Hour Construction: UL System C-AJ-1079; Specified Technologies Inc. SSS Intumescent Firestop Sealant.

- b. 3 Hour Construction: UL System C-AJ-1184; Hilti FS-ONE MAX Intumescent Firestop Sealant.
 - c. 3 Hour Construction: UL System C-AJ-1198; Specified Technologies Inc. SIL silicone sealant.
 - d. 2 Hour Construction: UL System C-AJ-1090; Specified Technologies Inc. SSP Firestop Putty.
 - e. 2 Hour Construction: UL System C-AJ-1198; Specified Technologies Inc. SIL silicone sealant.
 - f. 2 Hour Construction: UL System C-AJ-1226; Hilti FS-ONE MAX Intumescent Firestop Sealant.
3. Electrical Cables Not In Conduit:
- a. 3 Hour Construction: UL System C-AJ-3085; Specified Technologies Inc. LC Endothermic Firestop Sealant.
 - b. 3 Hour Construction: UL System C-AJ-3095; Hilti FS-ONE MAX Intumescent Firestop Sealant.
 - c. 3 Hour Construction: UL System C-AJ-3154; Specified Technologies Inc. SSS Intumescent Firestop Sealant.
 - d. 2 Hour Construction: UL System C-AJ-3154; Specified Technologies Inc. SSP Firestop Putty.
 - e. 2 Hour Construction: UL System C-AJ-3216; Hilti CFS-PL Firestop Plug.
4. Insulated Pipes:
- a. 3 Hour Construction: UL System C-AJ-5090; Hilti FS-ONE MAX Intumescent Firestop Sealant.
 - b. 2 Hour Construction: UL System C-AJ-5087; Specified Technologies Inc. SSS Intumescent Firestop Sealant.
 - c. 2 Hour Construction: UL System C-AJ-5091; Hilti FS-ONE IMAX intumescent Firestop Sealant.
5. HVAC Ducts, Uninsulated:
- a. 3 Hour Construction: UL System C-AJ-7051; Hilti FS-ONE MAX Intumescent Firestop Sealant.

2.04 MATERIALS

- A. Firestopping Sealants: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.
- B. Elastomeric Silicone Firestopping: Single component silicone elastomeric compound and compatible silicone sealant; conforming to the following:
 - 1. Manufacturers:
 - a. A/D Fire Protection Systems Inc: www.adfire.com.
 - b. 3M Fire Protection Products: www.3m.com/firestop.
 - c. Hilti, Inc: www.us.hilti.com.
 - d. Specified Technologies, Inc: www.stifirestop.com.
 - e. Substitutions: See Section 01 6000 - Product Requirements.
- C. Foam Firestopping: Single component silicone foam compound; conforming to the following:
 - 1. Manufacturers:
 - a. 3M Fire Protection Products: www.3m.com/firestop.
 - b. Hilti, Inc: www.us.hilti.com.
 - c. Specified Technologies, Inc: www.stifirestop.com.
 - d. Substitutions: See Section 01 6000 - Product Requirements.
- D. Fibered Compound Firestopping: Formulated compound mixed with incombustible non-asbestos fibers; conforming to the following:
 - 1. Manufacturers:
 - a. A/D Fire Protection Systems Inc: www.adfire.com.
 - b. USG: www.usg.com.

- c. Substitutions: See Section 01 6000 - Product Requirements.
- E. Firestop Devices - Wrap Type: Mechanical device with incombustible filler and collar, intended to be installed after penetrating item has been installed; conforming to the following:
 - 1. Manufacturers:
 - a. RectorSeal: www.rectorseal.com.
 - b. 3M Fire Protection Products: www.3m.com/firestop.
 - c. Hilti, Inc: www.us.hilti.com.
 - d. Specified Technologies, Inc: www.stifirestop.com.
 - e. Substitutions: See Section 01 6000 - Product Requirements.
- F. Intumescent Putty: Compound that expands on exposure to surface heat gain; conforming to the following:
 - 1. Manufacturers:
 - a. RectorSeal: www.rectorseal.com.
 - b. 3M Fire Protection Products: www.3m.com/firestop.
 - c. Hilti, Inc: www.us.hilti.com.
 - d. Specified Technologies, Inc: www.stifirestop.com.
 - e. Substitutions: See Section 01 6000 - Product Requirements.
- G. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify openings are ready to receive the work of this section.

3.02 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.
- B. Remove incompatible materials that could adversely affect bond.
- C. Install backing materials to prevent liquid material from leakage.

3.03 INSTALLATION

- A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
- B. Do not cover installed firestopping until inspected by authorities having jurisdiction.
- C. Install labeling required by code.

3.04 CLEANING

- A. Clean adjacent surfaces of firestopping materials.

3.05 PROTECTION

- A. Protect adjacent surfaces from damage by material installation.

END OF SECTION 07 8400

**SECTION 07 9200
JOINT SEALANTS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Nonsag gunnable joint sealants.
- B. Joint backings and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions: Additional requirements for sealants and primers.
- B. Section 07 2500 - Weather Barriers: Sealants required in conjunction with air barriers and vapor retarders.
- C. Section 07 8400 - Firestopping: Firestopping sealants.
- D. Section 08 7100 - Door Hardware: Setting exterior door thresholds in sealant.
- E. Section 08 8000 - Glazing: Glazing sealants and accessories.
- F. Section 23 3100 - HVAC Ducts and Casings: Duct sealants.

1.03 REFERENCE STANDARDS

- A. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants; 2015.
- B. ASTM C834 - Standard Specification for Latex Sealants; 2014.
- C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.
- D. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2000 (Reapproved 2011).
- E. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.
- F. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2008 (Reapproved 2012).
- G. ASTM C1311 - Standard Specification for Solvent Release Sealants; 2014.
- H. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2002 (Reapproved 2013).

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
 - 1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
 - 2. List of backing materials approved for use with the specific product.
 - 3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
 - 4. Substrates the product should not be used on.
 - 5. Substrates for which use of primer is required.
 - 6. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
- C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
- D. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section and with at least five years of documented experience.
- C. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
 - 1. Adhesion Testing: In accordance with ASTM C794.
 - 2. Compatibility Testing: In accordance with ASTM C1087.
 - 3. Allow sufficient time for testing to avoid delaying the work.
 - 4. Deliver to manufacturer sufficient samples for testing.
 - 5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.
 - 6. Testing is not required if sealant manufacturer provides data showing previous testing, not older than 24 months, that shows satisfactory adhesion, lack of staining, and compatibility.

1.06 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a five year period after Date of Substantial Completion.
- C. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal , exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 JOINT SEALANT APPLICATIONS

- A. Scope:
 - 1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
 - a. Wall expansion and control joints.
 - b. Joints between door, window, and other frames and adjacent construction.
 - c. Joints between different exposed materials.
 - d. Openings below ledge angles in masonry.
 - e. Other joints indicated below.
 - 2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
 - a. Joints between door, window, and other frames and adjacent construction.
 - b. Other joints indicated below.
 - 3. Do not seal the following types of joints.
 - a. Intentional weepholes in masonry.
 - b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
 - c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
 - d. Joints where installation of sealant is specified in another section.
 - e. Joints between suspended panel ceilings/grid and walls.
- B. Exterior Joints: Use non-sag non-staining silicone sealant, unless otherwise indicated.
- C. Interior Joints: Use non-sag polyurethane sealant, unless otherwise indicated.

2.02 JOINT SEALANTS - GENERAL

- A. Sealants and Primers: Provide products with levels of volatile organic compound (VOC) content as indicated in Section 01 6116.
- B. Color: As selected by Architect from manufacturer's full range.

2.03 NONSAG JOINT SEALANTS

- A. Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
 - 1. Movement Capability: Plus and minus 50 percent, minimum.
 - 2. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.
 - 3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
- B. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.
 - 1. Movement Capability: Plus and minus 25 percent, minimum.
 - 2. Color: To be selected by Architect from manufacturer's standard range.
 - 3. Service Temperature Range: Minus 40 to 180 degrees F.
- C. Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.
 - 1. Color: To be selected by Architect from manufacturer's standard range.
 - 2. Grade: ASTM C834; Grade - Minus 18 Degrees C.
- D. Butyl Sealant: Solvent-based; ASTM C1311; single component, nonsag; not expected to withstand continuous water immersion or traffic.
 - 1. Color: To be selected by Architect from manufacturer's standard range.
 - 2. Service Temperature Range: Minus 13 to 180 degrees F.

2.04 ACCESSORIES

- A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
 - 1. Type for Joints Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type O - Open Cell Polyurethane.
 - 2. Open Cell: 40 to 50 percent larger in diameter than joint width.
- B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.
- C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.
- D. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.
- E. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.

3.02 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.
- E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. Install bond breaker backing tape where backer rod cannot be used.
- D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
- E. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
- F. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

END OF SECTION 07 9200

**SECTION 08 0671
DOOR HARDWARE SCHEDULE**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Preliminary schedule of door hardware sets for swinging as indicated on drawings.

1.02 RELATED REQUIREMENTS

- A. Section 08 7100 - Door Hardware: Requirements to comply with in coordination with this section.

1.03 REFERENCE STANDARDS

- A. BHMA A156.5 - American National Standard for Cylinders and Input Devices for Locks; 2014.
- B. BHMA A156.18 - American National Standard for Materials and Finishes; 2012.
- C. DHI (H&S) - Sequence and Format for the Hardware Schedule; 1996.

1.04 PROJECT INFORMATION

- A. Project Name: 025037 Marathon County Public Library Restroom Renovation .
 - 1. Location: 100 W. County Road 'Y', Oshkosh, WI 54901.
- B. Architect: MartinRiley architects-engineers.
 - 1. Location: 404 N. Main Street, Suite 601, Oshkosh, WI 54901.
 - 2. Phone Number: 920-267-3600.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Comply with submittal requirements as indicated in Section 08 7100.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Only manufacturers listed in Door Hardware Schedule or Section 08 7100 are considered acceptable, unless noted otherwise.
- B. Obtain each type of door hardware as indicated from a single manufacturer and single supplier.
- C. Manufacturer's Abbreviations: Coordinate with manufacturers listed in Section 08 7100.
 - 1. AR - Adams Rite.
 - 2. BAS - Best Access Systems.
 - 3. CR - Corbin Russwin.
 - 4. CUR - Curries.
 - 5. GJ - Glynn Johnson.
 - 6. HGR - Hager.
 - 7. HIA - Hiawatha.
 - 8. IVE - Ives.
 - 9. LCN - LCN.
 - 10. McK - McKinney.
 - 11. NOR - Norton.
 - 12. PEM - Pemko.
 - 13. ROC - Rockwood.
 - 14. SA - Sargent.
 - 15. SCH - Schlage.
 - 16. SH - Stanley Hinges.
 - 17. TR - Trimco.
 - 18. VD - Von Duprin.
 - 19. YA - Yale.

2.02 DESCRIPTION

- A. Door hardware sets provided represent the design intent, they are only a guideline and should not be considered a detailed or complete hardware schedule.
 - 1. Provide door hardware item(s) as required for similar purposes, even when item is not listed for a door in Door Hardware Schedule.
 - 2. Necessary items that are not included in a Hardware Set should be added and have the appropriate additional hardware as required for proper application and functionality.
 - 3. Door hardware supplier is responsible for providing proper size and hand of door for products required in accordance with Door Hardware Schedule and as indicated on drawings.
 - 4. Quantities listed are for each Pair (PR) of doors, or for each Single (SGL) door, as indicated in hardware sets.

2.03 LOCK FUNCTION CODES

- A. Function Codes for Cylindrical Locks: Complying with BHMA A156.5.
 - 1. Code F76; Privacy Lock: Outside knob/lever locked by pushbutton on inside knob/lever. Rotating inside knob/lever or closing door releases/unlocks button. Emergency release in outside knob/lever.
 - 2. Code F82; Entry Lock: Push button locking. Button on inside locks outside knob/lever until unlocked by key or by rotating the inside knob/lever. Inside knob/lever always free. Deadlocking latch bolt.

2.04 FINISHES

- A. Finishes: Complying with BHMA A156.18.
 - 1. Code 626: Satin chromium plated over nickel, with brass or bronze base material (former US equivalent US26D).
 - 2. Code 630: Satin stainless steel, with stainless steel 300 series base material (former US equivalent US32D).

PART 3 EXECUTION

3.01 DOOR HARDWARE SCHEDULE

- A. Organize listing of door hardware components within each hardware set in compliance with 10-Part scheduling sequence indicated in DHI (H&S), unless otherwise indicated.

3.02 HARDWARE SET # 01: "RESTROOM"

- A. For use on Door Number(s): 101A.
- B. Provide for each Single (SGL) door(s).

UNITS	LOCK	ITEM	DESCRIPTION	FINISH	MFR
3 Each		HINGE	5BB1 4.5X4.5 MORTISE	626	SH
1 Each	F76	PRIVACY LOCK	TUBULAR, LEVER HANDLES	626	SCH
1 Each		SURFACE CLOSER	4011 REG AL	AL	LCN
1 Each		KICKPLATE	8400 8" X 2" LDW ON 101 SIDE	630	IVE
1 Kit		WEATHERSTRIPPING	PERIMETER, BULB TYPE		PEM
1 Each		SWEEP	ALUM W/ NEOPRENE BLADE	NA	PEM
1 Each		THRESHOLD	ADA, 1/2" HIGH, ALUM	NA	PEM

Lever style to be selected by architect.

Provide aluminum double coats hook screwed to door.

Kickplate to be screw mounted.

Closer to have spring stop/holder function and painted metal cover..

3.03 HARDWARE SET # 02: "VESTIBULE"

- A. For use on Door Number(s): 104A.
- B. Provide for each Single (SGL) door(s).
- C. 8400 8 Inch X 2 Inch LDW

<u>UNITS</u>	<u>LOCK</u>	<u>ITEM</u>	<u>DESCRIPTION</u>	<u>FINISH</u>	<u>MFR</u>
3 Each		HINGE	EXISTING		
1 Each		ENTRY LOCK	EXISTING W/ CORE		
1 Each		SURFACE CLOSER	EXISTING		
1 Each		KICKPLATE	8400 8 Inch X 2 Inch LDW	630	IVE
1 Kit		WEATHERSTRIPPING	PERIMETER, BULB TYPE		PEM
1 Each		SWEEP	ALUM W/ NEOPRENE BLADE	NA	PEM
3 Each		THRESHOLD	ADA, 1/2" HIGH, ALUM	NA	PEM

Fit new components to new door leaf and existing HM frame.

Existing lockset is tubular with lever handles.

Kickplate to be screw mounted on push side.

Fit existing closer with spring stop function, if closer cannot be retrofit with stop, provide a separate overhead stop device.

Provide new lockset, and/or closer if existing component is not appropriate for new condition.

Door may be locked or unlocked with a key, free egress at all times, self closing.

END OF SECTION 08 0671

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**SECTION 08 1213
HOLLOW METAL FRAMES**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Non-fire-rated hollow metal frames for non-hollow metal doors.

1.02 RELATED REQUIREMENTS

- A. Section 08 1416 - Flush Wood Doors: Non-hollow metal door for hollow metal frames.
- B. Section 08 7100 - Door Hardware: Hardware, silencers, and weatherstripping.
- C. Section 08 8000 - Glazing: Glazed borrowed lites.
- D. Section 09 9123 - Interior Painting: Field painting.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2009.
- C. ANSI/SDI A250.3 - Test Procedure and Acceptance Criteria for Factory Applied Finish Coatings for Steel Doors and Frames; 2007 (R2011).
- D. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2011.
- E. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames; 2003 (R2009).
- F. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2014.
- G. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2011.
- H. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- I. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2014.
- J. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- K. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.
- L. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.
- M. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; 2007.
- N. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2006.
- O. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2013.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced grade standard.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.
- D. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.
- E. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

- F. Manufacturer's Qualification Statement.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Manufacturer Qualifications: Provide hollow metal frames from SDI Certified manufacturer: www.steeldoor.org/sdicertified.php.
- C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store in accordance with applicable requirements and in compliance with standards and/or custom guidelines as indicated.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Hollow Metal Frames with Integral Casings:
 - 1. Ceco Door, an Assa Abloy Group company; _____: www.assaabloydss.com/#sle.
 - 2. Curries, an Assa Abloy Group company; _____: www.assaabloydss.com/#sle.
 - 3. Steelcraft, an Allegion brand; _____: www.allegion.com/#sle.
 - 4. or equivalent, as approved.
 - 5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DESIGN CRITERIA

- A. Refer to Door and Frame Schedule on the drawings for frame sizes, fire ratings, sound ratings, finishing, door hardware to be installed, and other variations, if any.
- B. Steel used for fabrication of frames shall comply with one or more of the following requirements; galvanized steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, Commercial Steel (CS) Type B for each.
- C. Accessibility: Comply with ICC A117.1 and ADA Standards.
- D. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturers standard.
- E. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior frame that is also indicated as being sound-rated must comply with the requirements specified for exterior frames and for sound-rated frames; where two requirements conflict, comply with the most stringent.
- F. Hardware Preparations, Selections and Locations: Comply with BHMA A156.115, NAAMM HMMA 830, NAAMM HMMA 831 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
- G. Zinc Coating for Units Subject to Corrosive Conditions: Components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvanized) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise.

2.03 HOLLOW METAL DOOR FRAMES WITH INTEGRAL CASINGS

- A. Frame Finish: Factory primed and field finished.
- B. Type ____, Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
 - 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 2 - Heavy-duty.
 - b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.

2. Terminated Stops: Provide at interior doors; closed end stop terminated 6 inch above floor at 45 degree angle.

2.04 FINISHES

- A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

2.05 ACCESSORIES

- A. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.
- B. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.
- C. Grout for Frames: Portland cement grout with maximum 4 inch slump for hand troweling; thinner pumpable grout is prohibited.
- D. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

- A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.
- B. Coat inside of other frames with bituminous coating to a thickness of 1/16 inch.

3.03 INSTALLATION

- A. Install frames in accordance with manufacturer's instructions and related requirements of specified frame standards or custom guidelines indicated.
- B. Coordinate frame anchor placement with wall construction.
- C. Comply with glazing installation requirements of Section 08 8000.
- D. Install door hardware as specified in Section 08 7100.
 1. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861.
- E. Touch up damaged factory finishes.

3.04 TOLERANCES

- A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.
- B. Maximum Diagonal Distortion: 1/16 inch measured with straight edges, crossed corner to corner.

3.05 SCHEDULE - SEE DRAWINGS

- A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION 08 1213

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**SECTION 08 1416
FLUSH WOOD DOORS**

PART 1 GENERAL**1.01 RELATED REQUIREMENTS**

- A. Section 08 1113 - Hollow Metal Doors and Frames.
- B. Section 08 7100 - Door Hardware.
- C. Section 08 8000 - Glazing.
- D. Section 09 9123 - Interior Painting: Field finishing of doors.
- E. Section 09 9300 - Staining and Transparent Finishing: Field finishing of doors.

1.02 REFERENCE STANDARDS

- A. ANSI A135.4 - American National Standard for Basic Hardboard; 2012.
- B. ANSI A208.1 - American National Standard for Particleboard; 2009.
- C. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.
- D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.0; 2016.
- E. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- F. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.
- G. WDMA I.S. 1A - Interior Architectural Wood Flush Doors; 2013.
- H. WI (CCP) - Certified Compliance Program (CCP); current edition at www.woodworkinstitute.com/certification.

1.03 SUBMITTALS

- A. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- B. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
- C. Samples: Submit two samples of door veneer, 8 by 10 inch in size illustrating wood grain, stain color, and sheen.
- D. Manufacturer's Installation Instructions: Indicate special installation instructions.
- E. Manufacturer's Qualification Statement.
- F. Installer's Qualification Statement.
- G. Warranty, executed in Owner's name.

1.04 WARRANTY

- A. Interior Doors: Provide manufacturer's warranty for ten years.
- B. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Wood Veneer Faced Doors:
 - 1. Graham Wood Doors: www.grahamdoors.com.
 - 2. Eggers Industries: www.eggersindustries.com/#sle.
 - 3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DOOR AND PANEL CORES

- A. Non-Rated Solid Core and 20 Minute Rated Doors: Type structural composite lumber core (SCLC), plies and faces as indicated.

2.03 DOOR FACINGS

- A. Facing Adhesive: Type I - waterproof.

2.04 DOOR CONSTRUCTION

- A. Fabricate doors in accordance with door quality standard specified.
- B. Cores Constructed with stiles and rails:
- C. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
- D. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
- E. Provide edge clearances in accordance with the quality standard specified.

2.05 ACCESSORIES

- A. Hollow Metal Door Frames: As specified in Section 08 1113.
- B. Glazed Openings:
 - 1. Heat-Strengthened and Fully Tempered Glass: ASTM C1048.
 - 2. Tint: Clear.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 TOLERANCES

- A. Comply with specified quality standard for fit and clearance tolerances.
- B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.03 ADJUSTING

- A. Adjust doors for smooth and balanced door movement.
- B. Adjust closers for full closure.

END OF SECTION 08 1416

**SECTION 08 7100
DOOR HARDWARE**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Hardware for wood and aluminum doors.
- B. Hardware for fire-rated doors.
- C. Electrically operated and controlled hardware.
- D. Lock cylinders for doors that hardware is specified in other sections.
- E. Thresholds.
- F. Weatherstripping and gasketing.

1.02 RELATED REQUIREMENTS

- A. Section 07 9200 - Joint Sealants: Sealants for setting exterior door thresholds.
- B. Section 08 1113 - Hollow Metal Doors and Frames.
- C. Section 08 4313 - Aluminum-Framed Storefronts: Door hardware, except as noted in section.
- D. Section 10 1400 - Signage: Additional signage requirements.
- E. Section 28 1000 - Access Control: Electronic access control devices.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. BHMA A156.2 - American National Standard for Bored and Preassembled Locks & Latches; 2011.
- C. BHMA A156.3 - American National Standard for Exit Devices; 2014.
- D. BHMA A156.4 - American National Standard for Door Controls - Closers; 2013.
- E. BHMA A156.8 - American National Standard for Door Controls - Overhead Stops and Holders; 2010.
- F. BHMA A156.15 - American National Standard for Release Devices - Closer Holder, Electromagnetic and Electromechanical; 2011.
- G. BHMA A156.22 - American National Standard for Door Gasketing and Edge Seal Systems, Builders Hardware Manufacturers Association; 2012.
- H. BHMA A156.31 - American National Standard for Electric Strikes and Frame Mounted Actuators; 2013.
- I. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2014.
- J. DHI (LOCS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames; 2004.
- K. DHI WDHS.3 - Recommended Locations for Architectural Hardware for Flush Wood Doors; 1993; also in WDHS-1/WDHS-5 Series, 1996.
- L. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- M. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025.
- N. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2025.
- O. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2012.
- P. UL (DIR) - Online Certifications Directory; Current Edition.

- Q. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- R. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.
- B. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.
- C. Convey Owner's keying requirements to manufacturers.
- D. Coordinate with electrician for proper installation of all electrical door elements and accessories.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.
- C. Samples: For each exposed finish.
- D. Product certificates.
- E. Door Hardware Sets: Prepared by hardware supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams.
 - 1. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.
 - 2. Content: Include the following information:
 - a. Identification number, location, hand, fire rating, and material of each door and frame.
 - b. Type, style, function, size, quantity, and finish of each door hardware item. Include description and function of each lockset and exit device.
 - c. Complete designations of every item required for each door or opening including name and manufacturer.
 - d. Description of each electrified door hardware function, including location, sequence of operation, and interface with other building control systems.
- F. Hardware Schedule: Detailed listing of each item of hardware to be installed on each door. Use door numbering scheme as included in the Contract Documents. Identify electrically operated items and include power requirements.
- G. Keying Schedule: Prepared by hardware supplier, detailing Owner's final keying instructions for locks.
- H. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- I. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- J. Keys: Deliver with identifying tags to Owner by security shipment direct from hardware supplier.
- K. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years of documented experience.

- B. Supplier Qualifications: Company with certified Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC) to assist in work of this section.
- C. Source Limitations: Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.
- D. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.
 - 1. Test Pressure: After 5 minutes into the test, neutral pressure level in furnace shall be established at 40 inches or less above the sill.
- E. Keying Conference: Conduct conference at Project. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system.
- F. Preinstallation Conference: Conduct conference at Project site.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Package hardware items individually; label and identify each package with door opening code to match door hardware schedule.
- B. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.
- C. Deliver keys to Owner by registered mail or overnight package service.

1.08 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Warranty against defects in material and workmanship for period indicated, from Date of Substantial Completion.
 - 1. Closers: Ten years, minimum.
 - 2. Exit Devices: Three years, minimum.
 - 3. Locksets and Cylinders: Three years, minimum.
 - 4. Other Hardware: Two years, minimum.

PART 2 PRODUCTS

201 DESIGN AND PERFORMANCE CRITERIA

- A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.
- B. Provide individual items of single type, of same model, and by same manufacturer.
- C. Provide door hardware products that comply with the following requirements:
 - 1. Applicable provisions of federal, state, and local codes.
 - 2. Fire-Rated Doors: NFPA 80, listed and labeled by qualified testing agency for fire protection ratings indicated, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.
 - 3. Hardware for Smoke and Draft Control Doors (Indicated as "S" on Drawings): Provide door hardware that complies with local codes, and requirements of assemblies tested in accordance with UL 1784.
 - 4. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified.
- D. Electrically Operated and/or Controlled Hardware: Provide necessary power supplies, power transfer hinges, relays, and interfaces as required for proper operation; provide wiring between hardware and control components and to building power connection in compliance with NFPA 70.

- E. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Sets" Article. Products are identified by using door hardware designations, as follows:
1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 "Door Hardware Sets" Article.

202 HINGES

- A. Manufacturers:
1. Hager Companies: www.hagerco.com/#sle.
 2. IVES Hardware; an Allegion Company (IVS).
 3. BEST, dormakaba Group: www.bestaccess.com.
- B. Hinges: Complying with BHMA A156.1, Grade 1.
1. Continuous Hinges: Complying with BHMA A156.26.
 - a. General: Minimum 0.120-inch- (3.0-mm-) thick; fabricated to full height of door and frame and to template screw locations; with components finished after milling and drilling are complete.
 - b. Fire Pins: Steel pins to hold labeled fire doors in place if required by tested listing.
 - c. Continuous, Gear-Type Hinges: Extruded-aluminum, pinless, geared hinge leaves; joined by a continuous extruded-aluminum channel cap; with concealed, self-lubricating thrust bearings.
 2. Provide hinges on every swinging door.
 3. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
 4. Provide ball-bearing hinges at each door with closer.
 5. Provide hinges in the quantities indicated.
 6. Provide non-removable pins on exterior and corridor outswinging doors with locks.
 7. Provide power transfer hinges where electrified hardware is mounted in door leaf.
 8. Provide following quantity of butt hinges for each door:
 - a. Doors up to 60 inches High: Two hinges.
 - b. Doors From 60 inches High up to 90 inches High: Three hinges.
 - c. Doors 90 inches High up to 120 inches High: Four hinges.
- C. Template Requirements: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.
- D. Hinge Base Metal: Unless otherwise indicated, provide the following:
1. Exterior Hinges: Stainless Steel, with stainless-steel pin.
 2. Interior Hinges: Steel, with steel pin.
 3. Hinges for Fire-Rated Assemblies: Steel, with steel pin.
- E. Hinge Weight: Unless otherwise indicated, provide the following:
1. Provide standard weight hinges .134" thick on doors up to and including 36" wide.
 2. Provide heavy weight hinges .180" thick on doors over 36" wide.
- F. Hinge Size: Unless otherwise indicated, provide the following:
1. 4.5" x 4.5" hinges.
- G. Fasteners: Comply with the following:
1. Machine Screws: For metal doors and frames. Install into drilled and tapped holes.
 2. Wood Screws: For wood doors and frames.
 3. Threaded-to-the-Head Wood Screws: For fire-rated wood doors.
 4. Screws: Phillips flat-head; Finish screw heads to match surface of hinges.

203 LOCK CYLINDERS

- A. Manufacturers:
1. Best Access Systems, division of Stanley Access Technologies LLC: www.bestaccess.com.
 2. No substitution.

- B. Accessibility Requirements: Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf (22N).
- C. Latches and Locks for Means of Egress Doors: Comply with NFPA IO I. Latches shall not require more than 15 lbf (67 NJ) to release the latch. Locks shall not require use of a key, tool, or special knowledge for operation.
- D. Locks: BHMA A156.2, cylindrical, Grade I lockset.
- E. Lock Trim:
 - 1. Levers: Cast
 - 2. Dummy Trim: Match lever lock trim and escutcheons.
- F. Backset: 2-3/4 inches (70 mm), unless otherwise indicated or required.
- G. Lever Design: Best "14D" style lever at cylindrical locks.
- H. Lock Cylinders: Provide key access on outside of each lock, unless otherwise indicated.
 - 1. Provide cylinders from same manufacturer as locking device.
 - 2. Provide cams and/or tailpieces as required for locking devices.
- I. Standard Lock Cylinders: BHMA A156.5, Grade I.
- J. Cylinders: Manufacturer's standard tumbler type, constructed from brass or bronze, stainless steel, or nickel silver, and complying with the following:
 - 1. Number of Pins: Seven.
- K. Construction Keying: Comply with the following:
 - 1. Construction Cores: Provide construction cores for use during construction period. Provide 10 construction master keys.
- L. Lock Cylinders are described in specification but supplied, keyed, and installed by owner. This is not Work of the General Contractor.

204 KEYING

- A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A. Incorporate decisions made in keying conference into new grand master key system.
 - 1. Quantity: In addition to one extra key blank for each lock, provide five master keys and five grand master keys.
 - 2. Keying and Keying Schedule to be by owner. Installation of Cores to be by owner.

205 DOOR PULLS AND PUSH PLATES

- A. Manufacturers:
 - 1. Ives (IVE).
 - 2. Trimco: www.trimcohardware.com/#sle.
- B. Door Pulls and Push Plates: Complying with BHMA A156.6.
 - 1. Material: Stainless steel, unless otherwise indicated.

206 CLOSERS

- A. Manufacturers; Surface Mounted:
 - 1. LCN
 - 2. BEST, dormakaba Group: www.bestaccess.com.
 - 3. No substitution.
- B. Accessibility Requirements: Comply with the following maximum opening-force requirements:
 - 1. Interior, Non-Fire-Rated Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
 - 2. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
- C. Door Closers for Means of Egress Doors: Comply with NFPA 101.
- D. Size of Units: Unless otherwise indicated, comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use.
- E. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening

force.

- F. Closers: Complying with BHMA A156.4, Grade 1.
 - 1. Provide door closer on each exterior door.
 - 2. Provide door closer on each fire-rated and smoke-rated door.
 - a. Spring hinges are not an acceptable self-closing device, unless otherwise indicated.
 - 3. Where an overlapping astragal is included on pairs of swinging doors, provide coordinator to ensure door leaves close in proper order.

207 PROTECTION PLATES

- A. Manufacturers:
 - 1. Ives, an Allegion brand: www.allegion.com/us/#sle.
 - 2. Rockwood
 - 3. Trimco: www.trimcohardware.com/#sle.
- B. Protection Plates: Complying with BHMA A156.6.
- C. Size: 2 inches less than door width on push side and 2 inches less than door width on pull side, by height specified in door hardware sets.
- D. Metal Protective Trim Units: BHMA A156.6; beveled top and 2 sides
- E. Metal Properties: Brass.
 - 1. Metal, Standard Duty: Thickness 0.05 inch, minimum.
- F. Edges: Beveled, on four sides unless otherwise indicated.
- G. Fasteners: Countersunk screw fasteners.

210 WALL STOPS

- A. Manufacturers:
 - 1. IVES (IVE).
 - 2. Trimco.
- B. Wall Stops: Complying with BHMA A156.16, Grade 1 and Resilient Material Retention Test as described in this standard.
 - 1. Provide wall stops to prevent damage to wall surface upon opening door, unless otherwise indicated.
 - 2. If wall stops are not practical, due to configuration of room or furnishings, provide overhead stop.
 - 3. Stop is not required if positive stop feature is specified for door closer; positive stop feature of door closer is not an acceptable substitute for a stop unless specifically so stated.

211 FABRICATION

- A. Base Metals: Produce door hardware units of base metal, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A 156.18. Do not furnish manufacturer's standard materials or forming methods if different from specified standard.
- B. Fasteners: Provide screws according to commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
 - 1. Comply with NFPA 80 for fasteners of door hardware in fire-rated applications.

212 FINISHES

- A. BHMA A156.18, as indicated in door hardware sets.

PART 3 EXECUTION

301 EXAMINATION

- A. Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames

are properly installed, and dimensions are as indicated on shop drawings.

- B. Verify that electric power is available to power operated devices and of correct characteristics.

302 INSTALLATION

- A. Install hardware in accordance with manufacturer's instructions and applicable codes.
 - 1. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 09 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- B. Install hardware on fire-rated doors and frames in accordance with applicable codes and NFPA 80.
- C. Steel Doors and Frames: Comply with OHi AI 15 Series. Drill and tap doors and frames for surface - applied door hardware according to ANSI A250.6.
- D. Wood Doors: Comply with DHI A115-W Series.
- E. Install hardware for smoke and draft control doors in accordance with NFPA 105.
- F. Use templates provided by hardware item manufacturer to avoid conflicts between hardware components. Contact hardware supplier prior to making field modifications.
- G. Do not install surface mounted items until application of finishes to substrate are fully completed.
- H. Door Hardware Mounting Heights: Distance from finished floor to center line of hardware item. As indicated in following list; unless noted otherwise in Door Hardware Schedule or on drawings.
 - 1. For Steel Doors and Frames: Install in compliance with DHI (LOCS) recommendations.
 - 2. For Wood Doors: Install in compliance with DHI WDHS.3 recommendations.
- I. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.

303 ADJUSTING

- A. Adjust work under provisions of Section 01 7000 - Execution and Closeout Requirements.
- B. Adjust hardware for smooth operation.
- C. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.
- D. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
 - 1. Door Closers: Unless otherwise required by authorities having jurisdiction, adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.
- E. Items of hardware not definitely specified herein but necessary for completion of the Work shall be provided. Such items shall be of type and quality suitable to the service required and comparable to the adjacent hardware. Where size and shape of members is such as to prevent the use of types specified, hardware shall be furnished of suitable types having as nearly as practicable the same operation and quality as the type specified. Sizes shall be adequate for the service required. Include such nuances as strike type, strike lip, raised barrel hinges, mounting brackets, blade stop spacers, special templates, fasteners, shims, and coordination between conflicting products. All doors shall be provided with a stop.

304 CLEANING

- A. Clean finished hardware in accordance with manufacturer's written instructions after final adjustments have been made.

- B. Clean adjacent surfaces soiled by hardware installation.
- C. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

3.05 PROTECTION

- A. Protect finished Work under provisions of Section 01 7000 - Execution and Closeout Requirements.
- B. Do not permit adjacent work to damage hardware or finish.

3.06 HARDWARE SCHEDULE**SET 01**

3 EA	HINGES	BB1279 (4.5" x 4.5")	10A	HAGER
1 EA	ENTRANCE LOCK	93K7AB 15C	613	BEST
1 EA	WALL STOP	409	613E	ROCKWOOD

SET 02

3 EA	HINGES	BB1279 (4.5" x 4.5")	10A	HAGER
1 EA	PUSH PLATE	70E	613E	ROCKWOOD
1 EA	PULL PLATE	111 x 70E	613E	ROCKWOOD
1 EA	CLOSER	4010 / 4110	STA	LCN
1 EA	WALL STOP	409	613E	ROCKWOOD
1 EA	KICK PLATE	8400 10" x 2" LDW B4E	613E	ROCKWOOD

SET 03

3 EA	HINGES	BB1279 (4.5" x 4.5")	10A	HAGER
1 EA	PRIVACY SET	45H0L VIB 15H	613	BEST
1 EA	WALL STOP	409	613E	ROCKWOOD

SET 04

3 EA	HINGES	BB1279 (4.5" x 4.5")	10A	HAGER
1 EA	ENTRANCE LOCK	93K7AB 15C	613	BEST
1 EA	OVERHEAD STOP	9000A	613	ABH

SET 05

3 EA	HINGES	BB1279 (4.5" x 4.5")	10A	HAGER
1 EA	PASSAGE SET	93K0N 15C	613	BEST
1 EA	WALL STOP	409	613E	ROCKWOOD

END OF SECTION

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**SECTION 09 2116
GYPSUM BOARD ASSEMBLIES**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Performance criteria for gypsum board assemblies.
- B. Acoustic insulation.
- C. Gypsum sheathing.
- D. Gypsum wallboard.
- E. Joint treatment and accessories.
- F. Water-resistive barrier over exterior wall sheathing.

1.02 RELATED REQUIREMENTS

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.
- C. Section 07 2100 - Thermal Insulation: Acoustic insulation.
- D. Section 07 2500 - Weather Barriers: Water-resistive barrier over sheathing.
- E. Section 07 9200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

1.03 REFERENCE STANDARDS

- A. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2015.
- B. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2014.
- C. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2015.
- D. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2013.
- E. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014.
- F. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base; 2014a.
- G. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014.
- H. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.
- I. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.
- J. ASTM E413 - Classification for Rating Sound Insulation; 2010.
- K. GA-216 - Application and Finishing of Gypsum Board; 2013.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on metal framing and gypsum board.
- C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum three years of experience.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

- A. Provide completed assemblies complying with ASTM C840 and GA-216.
- B. Interior Partitions, Indicated as Acoustic: Provide completed assemblies with the following characteristics:
 - 1. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

2.02 METAL FRAMING MATERIALS

- A. Manufacturers - Metal Framing, Connectors, and Accessories:
 - 1. Clarkwestern Dietrich Building Systems LLC: www.clarkdietrich.com.
 - 2. Jaimes Industries: www.jaimesind.com/#sle.
 - 3. Marino: www.marinoware.com.
 - 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 10 psf.
 - 1. Studs: "C" shaped with flat or formed webs.
 - 2. Runners: U shaped, sized to match studs.

2.03 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
 - 1. American Gypsum Company: www.americangypsum.com.
 - 2. CertainTeed Corporation: www.certainteed.com.
 - 3. Georgia-Pacific Gypsum: www.gpgypsum.com.
 - 4. National Gypsum Company: www.nationalgypsum.com.
 - 5. USG Corporation: www.usg.com.
 - 6. Substitutions: See Section 01 6000 - Product Requirements.
- B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
 - 1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
 - 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - 3. Thickness:
 - a. Vertical Surfaces: 5/8 inch.
 - b. Ceilings: 5/8 inch.
 - 4. Mold Resistant Paper Faced Products:

2.04 GYPSUM WALLBOARD ACCESSORIES

- A. Water-Resistive Barrier: As specified in Section 07 2500.
- B. Beads, Joint Accessories, and Other Trim: ASTM C1047, rigid plastic, galvanized steel, or rolled zinc, unless noted otherwise.
 - 1. Corner Beads: Low profile, for 90 degree outside corners.
 - 2. L-Trim with Tear-Away Strip: Sized to fit 5/8 inch thick gypsum wallboard.
 - 3. J-Trim: Sized to fit 5/8 inch thick gypsum wallboard.
- C. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
 - 1. Joint Compound: Drying type, vinyl-based, ready-mixed.
- D. High Build Drywall Surfacers: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.
- E. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

- A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.
- B. Studs: Space studs at 16 inches on center.
 - 1. Extend partition framing to structure where indicated and to ceiling in other locations.
 - 2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
- C. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

3.03 ACOUSTIC ACCESSORIES INSTALLATION

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Acoustic Sealant: Install in accordance with manufacturer's instructions.

3.04 BOARD INSTALLATION

- A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
 - 1. Exception: Tapered edges to receive joint treatment at right angles to framing.
- C. Installation on Metal Framing: Use screws for attachment of gypsum board.

3.05 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as follows:
 - 1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. J-trim (Casing Bead): Install at perimeter of gypsum board where indicated, or otherwise needed.
- D. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.06 JOINT TREATMENT

- A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
 - 1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish, glass mat gypsum locations and other areas specifically indicated.
 - 2. Level 0: Temporary partitions.
- B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
 - 1. Feather coats of joint compound so that camber is maximum 1/32 inch.
- C. Where Level 5 finish is indicated, spray apply high build drywall surfer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

END OF SECTION 09 2116

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**SECTION 09 3000
TILING****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Porcelain tile for floor applications.
- B. Ceramic tile for wall applications.
- C. Cementitious backer board as tile substrate.
- D. Cove Base Trim
- E. Non-ceramic trim.

1.02 RELATED REQUIREMENTS

- A. Section 07 9200 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.

1.03 REFERENCE STANDARDS

- A. ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium).; 2017.
- B. ANSI A108/A118/A136.1 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium).; 2013.1.
 - 1. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy; 1999 (Reaffirmed 2010).
 - 2. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 1999 (Reaffirmed 2010).
 - 3. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2010 (Reaffirmed 2016).
 - 4. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2005 (Reaffirmed 2010).
 - 5. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 2013 (Revised).
 - 6. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 1999 (Reaffirmed 2016).
 - 7. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes For Thin-Set Ceramic Tile And Dimension Stone Installation; 2014.
 - 8. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-set Ceramic Tile and Dimension Stone Installation; 2014.
 - 9. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2013.1.
- C. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2011.
- D. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2011.
- E. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2015.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
- C. Samples: Provide two full size tile sample illustrating pattern and color variations.

- D. Installer's Qualification Statement:
 - 1. Submit documentation of National Tile Contractors Association (NTCA) or Tile Contractors' Association of America (TCAA) accreditation.
- E. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.

1.05 QUALITY ASSURANCE

- A. Maintain one copy of and ANSI A108/A118/A136 and TCNA (HB) on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.
- C. Installer Qualifications:
 - 1. Company specializing in performing tile installation, with minimum of five years of documented experience.
 - 2. Installer Certification:
 - a. Ceramic Tile Education Foundation (CTEF): Certified Tile Installer (CTI).

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.07 FIELD CONDITIONS

- A. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

PART 2 PRODUCTS

2.01 TILE

- A. Manufacturers: All products by the same manufacturer.
 - 1. Dal-Tile Corporation: www.daltile.com/#sle.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.
- B. Glazed Wall Tile: ANSI A137.1 standard grade.
 - 1. Size: 3 by 12 inch, nominal.
 - 2. Thickness: 3/8"
 - 3. Surface Finish: Glossy
 - 4. Color(s): As indicated on drawings.
 - 5. Grout Joint: 1/8"
 - 6. Installation Method: Stack bond and chevron. Refer to drawings.
 - 7. Trim Units: Matching jolly trim #S1/212J
 - 8. Products:
 - a. Dal-Tile Corporation; Artcrafted: www.daltile.com/#sle.
- C. Porcelain Floor Tile: ANSI A137.1, standard grade.
 - 1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
 - 2. Size: 12 by 24 inch, nominal.
 - 3. Thickness: 5/16 inch.
 - 4. Surface Finish: Matte.
 - 5. Color(s): As indicated on drawings.
 - 6. Installation Method: Staggered.
 - 7. Grout Joint: 1/8 inch
 - 8. Trim Units: Matching cove base shapes in sizes indicated.
 - 9. Products:
 - a. Dal-Tile Corporation; Fixture: www.daltile.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.

2.02 TRIM AND ACCESSORIES

- A. Trim: Matching cove base porcelain tile and ceramic tile trim

1. Applications:
 - a. Ceramic Wall Tile Open Edges: Jolly
 - b. Floor to Wall Joints: Cove base.
 2. Manufacturers: Same as for floor and wall tile.
- B. Non-Ceramic Trim: Integrally colored extruded PVC, style and dimensions to suit application, for setting using tile mortar or adhesive.
1. Applications:
 - a. Transition between floor finishes of different heights.
 2. Manufacturers:
 - a. Tarkett: www.tarkett.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- C. Surface & Expansion Joints
1. Applications:
 - a. Tiled flooring with expansion joints.
 2. Product:
 - a. Schluter-Systems Dilex-BT Expansion Joint Profile
 - b. Color: Satin Anodized Aluminum

2.03 SETTING MATERIALS

- A. Manufacturers:
1. LATICRETE International, Inc: www.laticrete.com/#sle.
 2. Substitutions: See Section 01 6000 - Product Requirements.
- B. Mortar Bond Coat: ANSI A118.3.
1. Applications: Heavy tile mortar specifically formulated for large format porcelain tile on floor. Suitable substrate: concrete
 2. Products:
 - a. LATICRETE International, Inc; LATICRETE LHT: www.laticrete.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.

2.04 GROUTS

- A. Manufacturers:
1. LATICRETE International, Inc: www.laticrete.com/#sle.
 2. Substitutions: See Section 01 6000 - Product Requirements.
- B. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
1. Applications: Areas as indicated on drawings..
 2. Color(s): As indicated on drawings.
 3. Products:
 - a. LATICRETE International, Inc; LATICRETE SPECTRALOCK PRO Premium Grout: www.laticrete.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- C. Tile Sealant: Gunnable, silicone, siliconized acrylic, or urethane sealant; moisture and mildew resistant type.
1. Applications: Between tile and plumbing fixtures.
 2. Color(s): As selected by Architect from manufacturer's full line.
 3. Products:
 - a. LATICRETE International, Inc; LATICRETE LATASIL: www.laticrete.com.
 - b. Substitutions: See Section 01 6000 - Product Requirements.

2.05 MAINTENANCE MATERIALS

- A. Tile Sealant: Gunnable, silicone, siliconized acrylic, or urethane sealant; moisture and mildew resistant type.
1. Applications: Between tile and plumbing fixtures.
 2. Products:

- a. LATICRETE International, Inc; LATICRETE LATASIL: www.laticrete.com/#sle.
- b. Substitutions: See Section 01 6000 - Product Requirements.

2.06 ACCESSORY MATERIALS

- A. Concrete Floor Slab Crack Isolation Membrane: Material complying with ANSI A118.12; not intended as waterproofing.
- B. Primer: To enhance the adhesion of mortar to substrate and improve bonding of self-leveling underlayments
 1. Type: Fluid-applied.
 2. Applications: Use on existing concrete substrate where floor tile is indicated to be installed.
 3. Thickness: 20 mils, maximum.
 4. Fluid or Trowel Applied Type:
 - a. Material: Synthetic rubber.
 - b. Thickness: 20 mils, maximum.
 - c. Products:
 - 1) LATICRETE International, Inc; LATICRETE Blue 92 Anti-Fracture Membrane: www.laticrete.com/#sle.
 - 2) Substitutions: See Section 01 6000 - Product Requirements.
 5. Products:
 - a. LATICRETE International, Inc; PRIME-N-BOND; www.laticrete.com/#sle.
- C. Waterproofing Membrane at Floors: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
 1. Fluid or Trowel Applied Type:
 - a. Material: Synthetic rubber.
 - b. Products:
 - 1) LATICRETE International, Inc; LATICRETE HYDRO BAN: www.laticrete.com/#sle.
 - 2) Substitutions: See Section 01 6000 - Product Requirements.
- D. Backer Board: Underlayment for wall tile.
 1. Products:
 - a. Custom Building Products; WonderBoard Lite Backerboard: www.custombuildingproducts.com/#sle.
 - b. Laticrete Hydro Ban Board; www.laticrete.com/#sle.
 - c. Substitutions: See Section 01 6000 - Product Requirements.
- E. Mesh Tape: 2 inch wide self-adhesive fiberglass mesh tape.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.
- B. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.
- C. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.

3.02 PREPARATION

- A. Protect surrounding work from damage.
- B. Vacuum clean surfaces and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

- D. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.

3.03 INSTALLATION - GENERAL

- A. Install tile and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.13, manufacturer's instructions, and TCNA (HB) recommendations.
- B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor and base joints.
- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
- E. Install non-ceramic trim in accordance with manufacturer's instructions.
- F. Keep control and expansion joints free of mortar, grout, and adhesive.
- G. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- H. Grout tile joints unless otherwise indicated.
- I. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.04 INSTALLATION - FLOORS - THIN-SET METHODS

- A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F131, with epoxy grout.
- B. Install tile-to-tile floor movement joints in accordance with TCNA (HB) Method EJ171F.

3.05 INSTALLATION - WALL TILE

- A. Over backer units on studs, install in accordance with TCNA (HB) Method W244, using membrane at toilet rooms.

3.06 CLEANING

- A. Clean tile and grout surfaces.

3.07 PROTECTION

- A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION 09 3000

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**SECTION 09 5100
ACOUSTICAL CEILINGS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Suspended metal grid ceiling system.
- B. Acoustical units.

1.02 RELATED REQUIREMENTS

- A. Section 26 5100 - Interior Lighting: Light fixtures in ceiling system.
- B. Section 28 4600 - Fire Detection and Alarm: Fire alarm components in ceiling system.

1.03 REFERENCE STANDARDS

- A. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2013a.
- B. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2014.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on suspension system components.
- C. Samples: Submit two samples 6 by 6 inch in size illustrating material and finish of acoustical units.
- D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Extra Acoustical Units: Quantity equal to 5 percent of total installed of each product specified.

1.06 QUALITY ASSURANCE

- A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.07 FIELD CONDITIONS

- A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Acoustic Tiles/Panels:
 - 1. USG: www.usg.com.
 - 2. Substitutions: Not allowed
- B. Suspension Systems:
 - 1. Same as for acoustical units.
 - 2. Substitutions: Not allowed

2.02 ACOUSTICAL UNITS

- A. Acoustical Units - General: ASTM E1264, Class A.
- B. Acoustical Panels, Type III: Painted mineral fiber, with the following characteristics:
 - 1. Classification: ASTM E1264-23 Type A
 - a. Form: A1.2

- b. Pattern: "C" - perforated, small holes.
 2. Thickness: 7/8 inches
 3. Light Reflectance: 0.84 percent, determined in accordance with ASTM E1264.
 4. NRC: 0.70, determined in accordance with ASTM E1264.
 5. Ceiling Attenuation Class (CAC): 35, determined in accordance with ASTM E1264.
 6. Panel Edge: SLT.
 7. Color: White.
 8. Suspension System: Exposed grid.
 9. Products:
 - a. USG Corporation; Radar High-NRC/High-CAC Acoustical Panels:
www.usg.com/#sle.
 - b. Substitutions: Not Allowed
- C. Acoustical Tile Type G: Vinyl faced gypsum panel with the following characteristics:
 1. Form: ASTM E1264-23 Form G2
 2. Pattern: ASTM E1264-23 Pattern G
 3. Size: 24 by 24 inches.
 4. Thickness: 1/2 inches.
 5. Composition: Gypsum Panel.
 6. Light Reflectance: 77 percent, determined in accordance with ASTM E1264.
 7. Edge: Square.
 8. Surface Color: White.
 9. Products:
 - a. Sheetrock Brand Lay-In Gypsum Ceiling Panel with ClimaPlus Performance.
 - b. Item No. 3260 .
 - c. Substitutions: Not Allowed

2.03 SUSPENSION SYSTEM(S)

- A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with stabilizer bars, clips, splices, and perimeter moldings as required.
- B. Exposed Steel Suspension System: Formed galvanized steel, commercial quality cold rolled; heavy-duty.
 1. Profile: Tee; 15/16 inch wide face.
 2. Fire Rating: Class A
 3. Finish: Standard Flat White 050.
 4. Products:
 - a. USG Donn Brand DX/DXL Acoustical Suspension System.
 - b. Substitutions: Not Allowed

2.04 ACCESSORIES

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.
- B. Hanger Wire: 12-gage 0.08 inch galvanized steel wire.
- C. Perimeter Moldings: Same metal and finish as grid.
 1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers will not interfere with other work.

3.02 PREPARATION

- A. Install after major above-ceiling work is complete.

- B. Coordinate the location of hangers with other work.

3.03 INSTALLATION - SUSPENSION SYSTEM

- A. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- B. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.
- C. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 - 1. Use longest practical lengths.
- D. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
- E. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- H. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
- I. Do not eccentrically load system or induce rotation of runners.
- J. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.

3.04 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Fit border trim neatly against abutting surfaces.
- D. Install units after above-ceiling work is complete.
- E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- F. Cutting Acoustical Units:
 - 1. Make field cut edges of same profile as factory edges.

3.05 TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION 09 5100

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**SECTION 09 6500
RESILIENT FLOORING**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Resilient base.
- B. Installation accessories.

1.02 RELATED REQUIREMENTS

- A. Section 09 6813 Tile Carpeting

1.03 REFERENCE STANDARDS

- A. ASTM F1861 - Standard Specification for Resilient Wall Base; 2008 (Reapproved 2012).

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Verification Samples: Submit two full size samples illustrating color and pattern for each resilient wall base specified.
- D. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Extra Wall Base: 5% of the total quantity installed.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum five years documented experience.
- B. Installer Qualifications: Company specializing in installing specified flooring with minimum of five years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.
- B. Store all materials off of the floor in an acclimatized, weather-tight space.
- C. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
- D. Protect roll materials from damage by storing on end.

1.07 FIELD CONDITIONS

- A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

PART 2 PRODUCTS**2.01 RESILIENT BASE**

- A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove.
 - 1. Manufacturers:
 - a. Johnsonite, a Tarkett Company: www.johnsonite.com/#sle.
 - 2. Height: 4 inch.
 - 3. Thickness: 0.125 inch.
 - 4. Finish: Matte.
 - 5. Length: Roll.

6. Color: As indicated on drawings.

2.02 ACCESSORIES

- A. Transition and Edge Strips: Vinyl
 1. Manufacturers:
 - a. Tarkett; Johnsonite Finishing Accessories: www.tarkett.com/#sle.
 - b. Color: As indicated on drawings.
- B. Filler for Coved Base: Plastic.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.

3.02 PREPARATION

- A. Prohibit traffic until filler is fully cured.
- B. Clean substrate.

3.03 INSTALLATION - GENERAL

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. Install in accordance with manufacturer's written instructions.
- C. Spread only enough adhesive to permit installation of materials before initial set.
- D. Fit joints and butt seams tightly.

3.04 INSTALLATION - RESILIENT BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 30 inches between joints.
- B. Job-Formed Corners:
 1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends. Shave back of base at points where bends occur and remove strips perpendicular to length of base that are only deep enough to produce a snug fit without removing more than half the wall base thickness. Base which has been overstretched or deformed at corners to effectively eliminate the cove or loses bond at corners will be rejected.
 2. Inside Corners: Use straight pieces of maximum lengths possible. Form by cutting an inverted V-shaped notch in toe of wall base at the point where corner is formed. Shave back of base where necessary to produce a snug fit to substrate.
- C. Install base on solid backing. Bond tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.

3.05 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean in accordance with manufacturer's written instructions.

3.06 PROTECTION

- A. Protect until substantial completion.

END OF SECTION 09 6500

**SECTION 09 6813
TILE CARPETING****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Carpet tile, fully adhered.
- B. Removal of existing carpet tile.

1.02 RELATED REQUIREMENTS

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 09 0561 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.

1.03 REFERENCE STANDARDS

- A. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials; 2006 (Reapproved 2011).
- B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2014c.
- C. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2011.
- D. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2011.
- E. CRI 104 - Standard for Installation of Commercial Carpet; 2015.
- F. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2015.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics.
- C. Manufacturer's Installation Instructions: Indicate special procedures.
- D. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.
- E. Installer's Qualification Statement.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in installing carpet tile with minimum five years documented experience and approved by carpet tile manufacturer.
- B. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

1.06 FIELD CONDITIONS

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Tile Carpeting: Furnished By Owner, Installed by General Contractor
 - 1. Interface, Inc: www.interfaceinc.com/#sle.

2.02 MATERIALS

- A. Tile Carpeting: Tufted, manufactured in one color dye lot.
 - 1. Product: The Standard #1467302500 manufactured by Interface.
 - 2. Tile Size: 19.69 inch x 19.69 inch (50 cm x 50 cm)

3. Pile Thickness: 0.074 inch.
4. Color: 009361 Mangrove.
5. Dye Method: 100% Solution Dyed
6. Product Construction: Tufted Textured Loop.
7. Critical Radiant Flux: Minimum of 0.22 watts/sq cm, when tested in accordance with ASTM E648 or NFPA 253.
8. Surface Flammability Ignition: Pass ASTM D2859 (the "pill test").
9. Primary Backing Material: GlasBac.
10. Total Weight: 15 oz/sq yd.
11. Installation Method: Non Directional

2.03 ACCESSORIES

- A. Edge Strips: Vinyl, color as indicated on drawings.
 1. Installation Method: Manufacturer recommended.
- B. Carpet Tile Adhesive (Provided by General Contractor): Recommended by carpet tile manufacturer..
- C. Expansion Joint:
 1. Construction Specialties "GFPS Series"; flush gasketed floor cover designed for carpeted floors for minimal bump.
 2. Finish: Platinum, clear anodized finish

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.
- B. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to subfloor surfaces.
- C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for flooring installation by testing for moisture and pH.
 1. Test in accordance with Section 09 0561.
 2. Test as Follows:
 - a. Alkalinity (pH): ASTM F710.
 - b. Internal Relative Humidity: ASTM F2170.
 - c. Moisture Vapor Emission: ASTM F1869.
 3. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.

3.02 PREPARATION

- A. Remove existing carpet tile.
- B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- C. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.
- D. Vacuum clean substrate.

3.03 INSTALLATION

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. Install carpet tile in accordance with manufacturer's instructions.
- C. Blend carpet from different cartons to ensure minimal variation in color match.
- D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
- E. Installation Method: Non Directional
- F. Fully adhere carpet tile to substrate.

- G. Trim carpet tile neatly at walls and around interruptions.
- H. Complete installation of edge strips, concealing exposed edges.

3.04 CLEANING

- A. Remove excess adhesive without damage, from floor, base, and wall surfaces.
- B. Clean and vacuum carpet surfaces.

END OF SECTION 09 6813

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**SECTION 09 9113
EXTERIOR PAINTING**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
 - 1. Exposed surfaces of steel lintels and ledge angles.
- D. Do Not Paint or Finish the Following Items:
 - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
 - 5. Floors, unless specifically indicated.
 - 6. Glass.
 - 7. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 05 5000 - Metal Fabrications: Shop-primed items.
- C. Section 09 9123 - Interior Painting.

1.03 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition, www.paintinfo.com.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide complete list of products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
 - 2. MPI product number (e.g. MPI #47).
 - 3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
- C. Samples: Submit two paper chip samples, ___x___ inch in size illustrating range of colors and textures available for each surface finishing product scheduled.
- D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum five years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum five years experience and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.07 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply exterior paint and finishes during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- D. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.
- B. Paints:

2.02 PAINTS AND FINISHES - GENERAL

- A. Paints and Finishes: Ready mixed, unless required to be a field-catalyzed paint.
 - 1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 - 2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
 - 3. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
 - 4. Supply each paint material in quantity required to complete entire project's work from a single production run.
 - 5. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
 - 6. The use of deep colors or high contrast colors will require a minimum of three or more finish coats over primer to achieve satisfactory hiding results.
- B. Volatile Organic Compound (VOC) Content: Comply with Section 01 6116.
- C. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.
- D. Colors: To be selected from manufacturer's full range of available colors.
 - 1. Selection to be made by Architect after award of contract.

2.03 PAINT SYSTEMS - EXTERIOR

2.04 ACCESSORY MATERIALS

- A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
- C. Test shop-applied primer for compatibility with subsequent cover materials.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

3.03 APPLICATION

- A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- C. Apply each coat to uniform appearance.
- D. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- E. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

3.06 COLOR SCHEDULE

END OF SECTION 09 9113

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**SECTION 09 9123
INTERIOR PAINTING**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
- D. Do Not Paint or Finish the Following Items:
 - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
 - 5. Floors, unless specifically indicated.
 - 6. Glass.
 - 7. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 09 9113 - Exterior Painting.

1.03 DEFINITIONS

- A. Comply with ASTM D16 for interpretation of terms used in this section.

1.04 REFERENCE STANDARDS

- A. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2014.
- B. ASTM D4258 - Standard Practice for Surface Cleaning Concrete for Coating; 2005 (Reapproved 2012).
- C. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition, www.paintinfo.com.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Samples: Submit one paper "draw down" sample, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
 - 1. Where sheen is specified, submit samples in only that sheen.
- C. Certification: By manufacturer that paints and finishes comply with VOC limits specified.
- D. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Extra Paint and Finish Materials: 1 gallon of each color; from the same product run, store where directed.
 - 3. Label each container with color in addition to the manufacturer's label.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum five years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum five years experience and approved by manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.08 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide paints and finishes from the same manufacturer to the greatest extent possible.
- B. Paints:
 - 1. Base Manufacturer: Hallman Lindsay: www.hallmanlindsay.com.
- C. Primer Sealers: Same manufacturer as top coats.
- D. Substitutions: Not permitted.

2.02 PAINTS AND FINISHES - GENERAL

- A. Paints and Finishes: Ready mixed, unless intended to be a field-catalyzed paint.
 - 1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 - 2. Supply each paint material in quantity required to complete entire project's work from a single production run.
 - 3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
 - 4. The use of deep colors or high contrast colors will require a minimum of three or more finish coats over primer to achieve satisfactory hiding results.
- B. Volatile Organic Compound (VOC) Content: Comply with Section 01 6116.
- C. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.
- D. Colors: To be selected from manufacturer's full range of available colors.
 - 1. Selection to be made by Architect after award of contract.

2.03 PAINT SYSTEMS - INTERIOR

- A. Paint I-OP - Interior Surfaces to be Painted, Unless Otherwise Indicated: Including gypsum board.
 - 1. Two top coats and one coat primer.
 - 2. Top Coat(s): Institutional Low Odor/VOC Interior Latex.
 - a. Products:

- 1) Hallman Lindsay Pro Kote Zero VOC Professional Interior Latex Paint, Lo-Sheen
 - 2) Substitutions: Not permitted.
- B. Paint I-OP-MD-DT - Medium Duty Door/Trim: For surfaces subject to frequent contact by occupants, including metals:
1. Medium duty applications include doors and door frames.
 2. Two top coats
 3. Top Coat(s): Interior Light Industrial Coating, Water Based.
 - a. Products:
 - 1) Hallman Lindsay Metalguard 338 Premium Acrylic DTM Primer/Finish, Semi-Gloss
 - 2) Substitutions: Not permitted.
- C. Top Coats: Industrial coating, manufacturerer finished aluminum.
1. Two top coats and one coat primer.
 2. Top Coat(s): High Performance Architectural Waterborne Acrylic Enamel.
 - a. Products:
 - 1) Hallman Lindsay Ultima Premium Water-Based Acrylic Enamel, semi-gloss
 - 2) Substitutions: Not permitted.

2.04 PRIMERS

- A. Primers: Provide the following unless other primer is required or recommended by manufacturer of top coats.
1. Interior Institutional Low Odor/VOC Primer Sealer.
 - a. Products:
 - 1) Hallman Lindsay Builders Legacy 227 Primer/Sealer
 - 2) Substitutions: Not permitted.
 2. Interior Rust-Inhibitive Water Based Primer.
 - a. Products:
 - 1) Hallman Lindsay Metalguard 338 Premium Acrylic DTM Primer/Finish
 - 2) Substitutions: Not permitted.

2.05 ACCESSORY MATERIALS

- A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin application of paints and finishes until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
- D. Test shop-applied primer for compatibility with subsequent cover materials.
- E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 1. Gypsum Wallboard: 12 percent.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Concrete:
 - 1. Clean concrete according to ASTM D4258. Allow to dry.
- F. Masonry:
 - 1. Prepare surface as recommended by top coat manufacturer.
- G. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.
- H. Aluminum: Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
- I. Galvanized Surfaces:
 - 1. Prepare surface according to SSPC-SP 2.
- J. Ferrous Metal:
 - 1. Solvent clean according to SSPC-SP 1.
 - 2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
 - 3. Remove rust, loose mill scale, and other foreign substances using using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.
- K. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

- A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- C. Apply each coat to uniform appearance in thicknesses specified by manufacturer.
- D. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.
- E. Sand metal surfaces lightly between coats to achieve required finish.
- F. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

- A. Protect finishes until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION 09 9123

**SECTION 10 1400
SIGNAGE****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. ADA Room Identification Signage

1.02 RELATED REQUIREMENTS

- A. Section 26 5100 - Interior Lighting: Exit signs required by code.

1.03 REFERENCE STANDARDS

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- B. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.
- C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including, room name, other text to be applied, sign and letter sizes, fonts, and colors.
 - 1. Submit for approval by Owner through Architect prior to fabrication.
- D. Manufacturer's Installation Instructions: Include installation templates and attachment devices.
- E. Manufacturer's Qualification Statement.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Package signs as required to prevent damage before installation.
- B. Store tape adhesive at normal room temperature.

1.07 FIELD CONDITIONS

- A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
- B. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Flat Signs:
 - 1. Basis of Design Product: Inpro Corporation, SignScape
 - a. PO Box 406 Muskego, WI 53150 USA
 - 2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SIGNAGE APPLICATIONS

- A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.
- B. Room and Door Signs: Provide a sign for restrooms and janitor storage.
 - 1. Sign Type: Interior unframed Signage
 - a. Tactile- Raised Characters

- b. Grade 2 Braille: Provide Grade 2 Braille produced with Raster Method patented process for placing Braille on signage. Raster Braille is computer engineered using a carbide-engraving bit, press-fit tool with vacuum pump and UV stable acrylic rasters.
 - c. Painted Colors: Provide sign panel consisting of .118" acrylic sheet bonded with .0312" sheet that is cut and assembled to create signage.
 - d. Painted Images: Provide sign panel consisting of .118" acrylic sheet bonded with .0312" sheet that is cut and assembled to create signage.
2. Character Height: Refer to drawings.
 3. Janitor Storage: Identify with room name and braille as indicated on drawings.
 4. Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN", and braille.

2.03 SIGN DESIGNS & SERIES

- A. Reference Inpro Corp for Collection Info
 1. Collection: Aspen
 2. Material: Applied Acrylic
 3. Corners: Square.
 4. Sizes: As indicated on drawings.
 5. Pictograms: Inpro Corp P2, P4,P6, and P26
 6. Background Color: To be selected from manufacturer standard colors
 7. Text/Pictogram Color: White
 8. Font: Helvetica, Arial or other Sans Serif font
 9. Character Case: Upper Case Only
 10. Wall Mounting of One-Sided Signs: Provide double-sided 3M VHB adhesive with conformable foam core to adhere unframed signage to clean, dry, well-sealed surfaces.

2.04 ACCESSORIES

- A. Tape Adhesive: Double sided tape, permanent adhesive.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
 1. Complete all finishing operations, including painting, before beginning installation of signage systems.
 2. Wall surface shall be dry and free from dirt, grease, and loose paint.

3.02 PREPARATION

- A. General: Prior to installation, clean substrate to remove dust, debris, and loose particles.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

3.04 CLEANING

- A. At completion of the installation, clean surfaces in accordance to the Inpro SignScape clean-up and maintenance instructions.

**SECTION 10 2113.19
PLASTIC TOILET COMPARTMENTS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Solid plastic toilet compartments.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Blocking and supports.
- B. Section 10 2800 - Toilet, Bath, and Laundry Accessories.

1.03 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- B. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2015.

1.04 ADMINISTRATIVE

- A. Coordination: Coordinate the work with placement of support framing and anchors in walls and ceilings.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on panel construction, hardware, and accessories.
- C. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.
- D. Samples: Submit two samples of partition panel material in size illustrating panel finish, color, and sheen.
- E. Manufacturer's Installation Instructions: Indicate special procedures.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A company regularly engaged in manufacturer of products specified in this section, and whose products have been in satisfactory use under similar service conditions for not less than 5 years.
- B. Installer Qualifications: A company regularly engaged in installation of products specified in this Section, with a minimum of 5 years of experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.

1.08 WARRANTY

- A. Manufacturer guarantees in plastic against breakage, corrosion, and delamination under normal conditions for 25 years from the date of receipt by the customer. If materials are found to be defective during that period for reasons listed above, the materials will be replaced free of charge. (Labor not included in warranty).

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Solid Plastic Toilet Compartments:
 - 1. Scranton Products (Santana/Comtec/Capital): www.scrantonproducts.com/#sle.
 - a. Address: 801 E. Cory Street, Scranton, PA 18505
 - b. Phone: 800-445-5148
 - 2. Substitutions: Section 01 6000 - Product Requirements.

2.02 PLASTIC TOILET COMPARTMENTS

- A. Solid Plastic Toilet Compartments: Factory fabricated doors, pilasters, and divider panels made of solid molded high density polyethylene (HDPE), graffiti-resistant textured surface; floor-mounted headrail-braced.
 - 1. Product: Eclipse Toilet Partitions as manufactured by and supplied by Scranton Products.
 - 2. Color: NPFA 286, As indicated on drawings.
- B. Doors:
 - 1. Thickness: 1 inch.
 - 2. Edges: Shiplap
 - 3. Width: 24 inch.
 - 4. Width for Handicapped Use: 36 inch, out-swinging.
 - 5. Height: 62 inch. Mounted at 10 inches above finished floor
- C. High Privacy Panels:
 - 1. Thickness: 1 inch.
 - 2. Height: 62 inch. Mounted at 10 inches above finished floor
- D. Metal Posts:
 - 1. 82.75 inches high, heavy duty extruded aluminum, clear anodized finish.
 - 2. Fasteners: Stainless steel resistant screws.
- E. Hidden Shoe:
 - 1. One-piece molded polyethylene invisible shoe inserted into metal post and secured to metal post with stainless steel tamper resistant screw.
- F. Headrail:
 - 1. Heavy duty extruded aluminum, designer anti-grip design, clear anodized finish, fastened to headrail bracket with stainless steel tamper resistant screw and to headrail cap or corner cap with stainless steel tamper resistant screw.
 - 2. Headrail brackets: Heavy duty extruded aluminum, clear anodized finish, secured to wall with stainless steel tamper resistant

2.03 ACCESSORIES

- A. Head Rail Cap and Corner Cap: One-piece molded polyethylene secured to metal post with stainless steel tamper resistant screw; adjustable to level headrail to finished floor.
 - 1. Size: Manufacturer's standard size.
- B. Wall Brackets: Continuous heavy duty extruded aluminum, clear anodized finish, inserted into slotted panel and fastened to panels with stainless steel tamper resistant screws.
 - 1. Type: Double ear bracket aluminum
 - 2. Length: For 62 inch high privacy panels
- C. Attachments, Screws, and Bolts: Stainless steel , tamper proof type.
- D. Hinges:
 - 1. Edge-mounted helix styl stainless steel continuous hinge
 - 2. Comes to a full close on its own weight.
- E. Occupancy Indicator Latch and Housing:
 - 1. Material: Satin Stainless Steel
 - 2. Occupancy Indicators: Green for occupied and red not occupied.
- F. Coat Hook and Door Bumper Combination: One per compartment, mounted on door.
 - 1. Material: Clear Anodized Aluminum
 - 2. Handicap Door: Equip with second door pull and door stop
- G. Door Pulls: Clear Anodized Aluminum

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify correct spacing of and between plumbing fixtures.
- C. Verify correct location of built-in framing, anchorage, and bracing.

3.02 INSTALLATION

- A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.
- B. Maintain 3/8 inch to 1/2 inch space between wall and panels and between wall and end pilasters.
- C. Attach panel brackets securely to walls using anchor devices.
- D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.

3.03 ADJUSTING

- A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.
- B. Adjust adjacent components for consistency of line or plane.

3.04 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 10 2113.19

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**SECTION 10 2601
WALL AND CORNER GUARDS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Corner guards.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Blocking for wall and corner guard anchors.

1.03 REFERENCE STANDARDS

- A. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Indicate physical dimensions and anchorage details.
- C. Samples: Verification sample of corner guard, 8" long, full size profile of each type indicated.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in unopened factory packaging to the jobsite.
- B. Inspect materials at delivery to assure that specified products have been received.
- C. Store in original packaging in a climate controlled location away from direct sunlight.

1.06 WARRANTY

- A. Standard IPC Limited Lifetime Warranty against material and manufacturing defects.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Corner Guards:
 - 1. Inpro: www.inprocorp.com/#sle.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 COMPONENTS

- A. Corner Guards - Surface Mounted:
 - 1. Product:
 - a. Clear Corner Guard manufactured and supplied by Inpro Corp.
 - 2. Material: PC/PETG: Clear corner guards shall be extruded from clear thermoplastic material.
 - 3. Wing Size: 1 1/8" inch
 - 4. Angle: 90 degree.
 - 5. Lengt: 48 inches.
- B. Hardware: Corner guards to be mounted with screws appropriate to component and substrate. Apply to corner with chrome plated screws for 1 1/8" wings.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.
- B. Verify conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
- C. Field verify dimensions of wall guards specified.

- D. Materials must be acclimated in environment of 65-75 degrees fahrenheit for at least 24 hours prior to beginning the installation.
- E. Do not proceed until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to wall framing members only.
- B. Position corner guard 4 inches above finished floor or wall base.

3.03 CLEANING

- A. General: Immediately upon completion of installation, clean guards in accordance with manufacturer's recommended cleaning method.
- B. Remove surplus materials, rubbish and debris resulting from installation as work progresses and upon completion of work.

3.04 PROTECTION

- A. Protect installed materials to prevent damage by other trades. Use materials that may be easily removed without leaving residue or permanent stains.

END OF SECTION 10 2601

**SECTION 10 2800
TOILET, BATH, AND LAUNDRY ACCESSORIES - ASI**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Baby changing stations.
- B. Feminine hygiene vendors and disposals.
- C. Grab bars.
- D. Waste receptacles.

1.02 RELATED REQUIREMENTS

- A. Section 09 3000 - Tiling: Ceramic washroom accessories.
- B. Section 10 2113.19 - Plastic Toilet Compartments.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2023.
- C. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use; 2004 (Reapproved 2010).
- D. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate work with the placement of internal wall reinforcement and reinforcement of toilet partitions to receive anchor attachments.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.
- C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Basis of Design Manufacturer: American Specialties, Inc: www.americanspecialties.com/#sle.
- B. Other Acceptable Manufacturers:
 - 1. Bradley Corp: www.bradleycorp.com/#sle.
 - 2. Bobrick: www.bobrick.com/#sle.
- C. Substitutions: See Section 01 6000 - Product Requirements.

2.02 BABY CHANGING STATIONS

- A. Baby Changing Station: Wall-mounted folding baby changing station for use in commercial toilet facilities, meeting or exceeding ASTM F2285.
 - 1. Material: As indicated in product listing.
 - 2. Mounting: As indicated in product listing.
 - 3. Minimum Rated Load: 250 lb.
 - 4. Products:
 - a. Model 9018-9 - Satin Stainless Steel Finish - Baby Changing Station - Horizontal - Surface-mounted.

2.03 FEMININE HYGIENE VENDORS AND DISPOSALS

- A. Sanitary Napkin Disposal Unit: Stainless steel, self-closing door, locking bottom panel with full-length heavy-duty stainless steel multi-staked piano hinge, removable receptacle.
 - 1. Mounting: As indicated in product listing.
 - 2. Cabinet and Door: Fully welded, 22 gauge, 0.03 inch thick sheet.
 - 3. Products:
 - a. Model 0472-1 - with Lock - Sanitary Napkin Disposal - Dual Access - Partition-mounted.
 - b. Model 20852 - Roval Collection - Sanitary Waste Receptacle - Surface-mounted.
 - c. Substitutions: Section 01 6000 - Product Requirements.

2.04 GRAB BARS

- A. Grab Bars: Type 304 stainless steel.
 - 1. Standard Duty Grab Bars:
 - a. Push/Pull Point Load: 250 lbf, minimum.
 - b. Clearance: 1-1/2 inch clearance between wall and inside of grab bar.
 - c. Finish: Stainless steel-satin
 - d. Length and Configuration: As indicated in product listing.
 - e. Products:
 - 1) Model 3800-18 length, Concealed Mounting, 1-1/2 inch OD - Straight Grab Bar, Type 304 Stainless Steel- Satin Finish; snap over mounting flange
 - 2) Model 3800- 24 length: Concealed Mounting, 1-1/2 inch OD - Straight Grab Bar, Type 304 Stainless Steel-Satin Finish; snap over mounting flange
 - 3) Model 3800-36 length; Concealed Mounting, 1 1/2 inch OD Straight Grab Bar, Type 304 Stainless Steel-Satin Finish, snap over mounting flange
 - 4) Model 304 3800-42 length; Concealed Mounting, 1 1/2 inch OD Straight Grab Bar, Type 304 Stainless Steel-Satin Finish; snap over mounting flange
 - 5) Substitutions: Section 01 6000 - Product Requirements.

2.05 MATERIALS

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
- B. Stainless Steel Sheet: ASTM A666, Type 304.
- C. Fasteners, Screws, and Bolts: Hot dip galvanized; tamperproof; security type.

2.06 FABRICATION

- A. Roval Collection:
 - 1. Basic Construction Requirements:
 - a. Doors: Curved design, one piece Type 304, 18 gauge, 0.05 inch stainless steel.
 - b. Cabinets: Type 304, 22 gauge, 0.0312 inch stainless steel, trimless; joints welded, sight-exposed welds finished to match sheet finish. Full access back panels.
 - c. Hinges: Concealed, heavy-duty stainless steel multi-staked piano hinge, full length of cabinet.
 - d. Locks: Two flush, rimless tumbler locks, keyed alike other toilet accessory locks, with one key for each lock.
 - e. Exposed Finish: No.4 satin finish, unless noted otherwise.

2.07 FINISHES

- A. Stainless Steel: Satin finish, unless otherwise noted.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify exact location of accessories for installation.

3.02 INSTALLATION

- A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.

3.03 PROTECTION

- A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION 10 2800

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**SECTION 12 3600
COUNTERTOPS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Wall-hung counters.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry for Wood Blocking Reinforcement Walls
- B. Section 22 4000 - Plumbing Fixtures: Sinks.

1.03 REFERENCE STANDARDS

- A. ANSI A208.1 - American National Standard for Particleboard; 2009.
- B. AWI (QCP) - Quality Certification Program; current edition at www.awiqcp.org.
- C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.
- D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.0; 2016.
- E. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Specimen warranty.
- C. Shop Drawings: Complete details of materials and installation ; combine with shop drawings of cabinets and casework specified in other sections.
- D. Verification Samples: For each finish product specified, minimum size 3 inches square, representing actual product, color, and patterns.
- E. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than five years of documented experience.
- B. Quality Certification:
 - 1. Comply with AWI (QCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section: www.awiqcp.org/#sle.
 - 2. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.07 FIELD CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 COUNTERTOPS

- A. Quality Standard: Custom Grade, in accordance with AWI/AWMAc/WI (AWS) or AWMAc/WI (NAAWS), unless noted otherwise.
- B. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting over continuous substrate.
 - 1. Flat Sheet Thickness: 1/2 inch, minimum.
 - 2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
 - a. Manufacturers:
 - 1) Livingstone: www.livingstone.com/#sle.
 - 2) Substitutions: Not permitted.
 - b. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
 - 3. Exposed Edge Treatment: Built up to minimum 1 1/2 inch thick; radiused edge.
 - 4. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.
 - 5. Skirts: As indicated on drawings.
 - 6. Fabricate in accordance with AWI/AWMAc/WI (AWS) or AWMAc/WI (NAAWS), Section 11 - Countertops, Premium Grade.

2.02 MATERIALS

- A. Wood-Based Components:
 - 1. Wood fabricated from old growth timber is not permitted.
- B. Moisture-Resistant Particleboard for Supporting Substrate: ANSI A208.1 Grade (MR), minimum density; minimum 3/4 inch thick; join lengths using metal splines.
- C. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.
- D. Countertop Bracket:
 - 1. Rakks EH-1818 countertop support bracket
 - 2. Finish: Off-White
- E. Wall Cleats
- F. Joint Sealant: Silicone sealant, white.

2.03 FABRICATION

- A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
 - 1. Join lengths of tops using best method recommended by manufacturer.
 - 2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
 - 3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
- B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
 - 1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
 - 2. Height: 4 inches, unless otherwise indicated.
- C. Wall-Mounted Counters: Provide aprons, brackets, and braces as indicated on drawings.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.

- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

- A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
- B. Seal joint between back/end splashes and vertical surfaces.
 - 1. Where indicated use rubber cove molding.
 - 2. Where applied cove molding is not indicated use specified sealant.

3.04 CLEANING

- A. Clean countertops surfaces thoroughly.

3.05 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION 12 3600

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**SECTION 22 0516
EXPANSION FITTINGS AND LOOPS FOR PLUMBING PIPING**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Flexible pipe connectors.
- B. Expansion joints and compensators.

1.02 REFERENCE STANDARDS

- A. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2024.
- B. EJMA (STDS) - EJMA Standards; Tenth Edition.
- C. UL (DIR) - Online Certifications Directory; Current Edition.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data:
 - 1. Flexible Pipe Connectors: Indicate maximum temperature and pressure rating, face-to-face length, live length, hose wall thickness, hose convolutions per foot and per assembly, fundamental frequency of assembly, braid structure, and total number of wires in braid.
 - 2. Expansion Joints: Indicate maximum temperature and pressure rating, and maximum expansion compensation.

PART 2 PRODUCTS**2.01 REGULATORY REQUIREMENTS**

- A. Comply with UL (DIR) requirements.

2.02 FLEXIBLE PIPE CONNECTORS - STEEL PIPING

- A. Inner Hose: Stainless steel.
- B. Exterior Sleeve: Single braided, stainless steel.
- C. Pressure Rating: 125 psi up to 12 inch.
- D. Maximum Service Temperature: 450 degrees F.
- E. End Connections: As specified for pipe joints.
- F. Size: Use pipe sized units.
- G. Maximum offset: 3/4 inch on each side of installed center line.

2.03 FLEXIBLE PIPE CONNECTORS - COPPER PIPING

- A. Inner Hose: Bronze.
- B. Exterior Sleeve: Braided bronze.
- C. Pressure Rating: 125 psi up to 2 inch.
- D. Maximum Service Temperature: 450 degrees F.
- E. End Connections: As specified for pipe joints.
- F. Size: Use pipe sized units.
- G. Maximum offset: 3/4 inch on each side of installed center line.
- H. Application: Copper piping.

2.04 EXPANSION JOINTS - STAINLESS STEEL BELLOWS TYPE

- A. Pressure Rating: 125 psi and 400 degrees F.
- B. Maximum Compression: 1-3/4 inches.
- C. Maximum Extension: 1/4 inch.

- D. Joint Type: Externally Externally pressurized as specified for pipe joints.
- E. Size: Use pipe sized units.
- F. Application: Steel piping 4 inches and under.

2.05 EXPANSION JOINTS - EXTERNAL RING CONTROLLED STAINLESS STEEL BELLOWS TYPE

- A. Pressure Rating: 125 psi and 400 degrees F.
- B. Maximum Compression: 15/16 inch.
- C. Maximum Extension: 5/16 inch.
- D. Maximum Offset: 1/8 inch.
- E. End Connections: Flanged.
- F. Size: Use pipe sized units.
- G. Accessories: Internal flow liner.
- H. Application: Steel piping over 2 inches.

2.06 EXPANSION JOINTS - SINGLE SPHERE, FLEXIBLE CONNECTOR

- A. Body Construction: Nylon-reinforced rubber tube.
- B. End Connections: Carbon steel flanges.
- C. Cover and Tube Elastomer: EPDM and EPDM.
- D. Maximum Compression: 1/2 inch.
- E. Maximum Elongation: 3/8 inch.
- F. Maximum Offset: 3/8 inch.
- G. Maximum Angular Movement: 15 degrees.
- H. Accessories: Control rods.
- I. Service Rating: Up to 35 psi at 220 degrees F.

2.07 EXPANSION JOINTS - TWO-PLY BRONZE BELLOWS TYPE

- A. Construction: Bronze with anti-torque device, limit stops, internal guides.
- B. Pressure Rating: 125 psi and 400 degrees F.
- C. Maximum Compression: 1-3/4 inches.
- D. Maximum Extension: 1/4 inch.
- E. Joint: As specified for pipe joints.
- F. Size: Use pipe sized units.
- G. Application: Copper piping.

2.08 EXPANSION JOINTS - COMPENSATORS

- A. Type: Two-ply 304 stainless steel bellows with carbon steel shroud.
- B. Maximum Working Pressure: 200 psi.
- C. Maximum Working Temperature: 400 degrees F.
- D. Maximum Compression: 1/2 inch.
- E. Maximum Extension: 5/32 inch.
- F. End Connections: Female copper sweat.
- G. Application: Copper piping up to 3 inches in size or steel piping up to 4 inches in size.

2.09 EXPANSION JOINTS - STEEL WITH PACKED SLIDING SLEEVE

- A. Working Pressure and Temperature: Class 150.
- B. End Connections: As specified for pipe joints.

- C. Size: Use pipe sized units.
- D. Application: Steel piping 2 inches and over.

2.10 EXPANSION JOINTS - COPPER WITH PACKED SLIDING SLEEVE

- A. Working Pressure: 125 psi.
- B. Maximum Temperature: 250 degrees F.
- C. End Connections: As specified for pipe joints.
- D. Size: Use pipe sized units.
- E. Application: Copper or steel piping 2 inches and over.

2.11 EXPANSION JOINTS - HOSE AND BRAID

- A. Provide flexible loops with two flexible sections of hose and braid, two 90 degree elbows, and 180 degree return with support brackets, air release valve, and plugged drain port.
- B. Maximum Allowable Motion: 2 inch in the x, y, and z planes with no thrust loads to the building structure.
- C. Maximum Working Pressure: 150 psi at 800 degrees F.
- D. Construction: Class 150, schedule 40, stainless steel hose and braid assembly with carbon steel fittings, including elbows and flanged end connections sized to match pipe segment.
 - 1. Selected Product to Accommodate:
 - a. Angular Rotation: 15 degrees.
 - b. Force developed by 1.5 times specified maximum allowable operating pressure.
 - 2. Provide necessary accessories including, but not limited to, swivel joints, limit stops, internal guides, anti-torque device, internal flow liners, control rods, and control cables.

2.12 EXPANSION JOINTS - EXTERNALLY PRESSURIZED

- A. Bellows Type: Two-ply, single bellows constructed of 304 stainless steel.
- B. Internal Liner: Carbon steel with internal and external guides.
- C. Specialty: Carbon steel anchor base, lifting lugs, and drain port with tapered plug.
- D. End Connections: Class 150, carbon steel, welded flange.
- E. Maximum Axial Compression: 4 inches.
- F. Maximum Working Pressure: 150 psi at 700 degrees F.
- G. Application: Steel piping 2 inches and over.

2.13 ACCESSORIES

- A. Stainless Steel Pipe: ASTM A269/A269M, seamless type, Grade TP304.
- B. Pipe Alignment Guides:
 - 1. Two piece welded steel with enamel paint, bolted, with spider to fit standard pipe, frame with four mounting holes, clearance for minimum 1 inch thick insulation, minimum 3 inches travel.
- C. Swivel Joints:
 - 1. Fabricated steel body, double ball bearing race, field lubricated, with rubber (Buna-N) o-ring seals.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with EJMA (Expansion Joint Manufacturers Association) Standards.
- C. Install flexible pipe connectors on pipes connected to vibration isolated equipment. Provide line size flexible connectors.

- D. Install flexible connectors at right angles to displacement. Install one end immediately adjacent to isolated equipment and anchor other end. Install in horizontal plane unless indicated otherwise.
- E. Anchor pipe to building structure where indicated. Provide pipe guides so movement is directed along axis of pipe only. Erect piping such that strain and weight is not on cast connections or apparatus.

END OF SECTION 22 0516

SECTION 22 0517
SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Pipe sleeves.
- B. Pipe sleeve-seals.

1.02 RELATED REQUIREMENTS

- A. Section 07 8400 - Firestopping.

1.03 REFERENCE STANDARDS

- A. ASTM C592 - Standard Specification for Mineral Fiber Blanket Insulation and Blanket-Type Pipe Insulation (Metal-Mesh Covered) (Industrial Type); 2024.
- B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2024.
- C. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.

1.05 QUALITY ASSURANCE

- A. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store sleeve and sleeve seals in shipping containers, with labeling in place.
- B. Provide temporary protective coating on cast iron and steel sleeves if shipped loose.

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS**2.01 PIPE SLEEVES**

- A. Vertical Piping:
 - 1. Sleeve Length: 1 inch above finished floor.
 - 2. Provide sealant for watertight joint.
 - 3. Blocked Out Floor Openings: Provide 1-1/2 inch angle set in silicon adhesive around opening.
 - 4. Drilled Penetrations: Provide 1-1/2 inch angle ring or square set in silicone adhesive around penetration.
- B. Sheet Metal: Pipe passing through interior walls, partitions, and floors, unless steel or brass sleeves are specified below.
- C. Pipe Passing Through Below Grade Exterior Walls:
 - 1. Zinc coated or cast iron pipe.
 - 2. Provide watertight space with link rubber or modular seal between sleeve and pipe on both pipe ends.
- D. Pipe Passing Through Concrete Beam Flanges, except where Brass Pipe Sleeves are Specified:
 - 1. Galvanized steel pipe or black iron pipe with asphalt coating.
 - 2. Connect sleeve with floor plate except in mechanical rooms.
- E. Pipe Passing Through Mechanical, Laundry, and Animal Room Floors above Basement:
 - 1. Galvanized steel pipe or black iron pipe with asphalt coating.
 - 2. Connect sleeve with floor plate except in mechanical rooms.

- F. Penetrations in concrete beam flanges are permitted but are prohibited through ribs or beams without prior approval from the Architect.
- G. Clearances:
 - 1. Provide allowance for insulated piping.
 - 2. Wall, Floor, Partitions, and Beam Flanges: 1 inch greater than external pipe diameter.
 - 3. All Rated Openings: Caulked tight with fire stopping material complying with ASTM E814 in accordance with Section 07 8400 to prevent the spread of fire, smoke, and gases.

2.02 PIPE-SLEEVE SEALS

- A. Modular Mechanical Sleeve-Seal:
 - 1. Elastomer-based interlocking links continuously fill annular space between pipe and wall-sleeve, wall or casing opening.
 - 2. Watertight seal between pipe and wall-sleeve, wall or casing opening.
 - 3. Size and select seal component materials in accordance with service requirements.
 - 4. Service Requirements:
 - a. Corrosion resistant.
 - b. Oil, fuel, gas, and solvent resistant.
 - c. Underground, buried, and wet conditions.
 - d. Fire Resistant: 1 hour, UL (DIR) approved.
 - e. High Temperature, up to 400 degrees F.
 - f. Low temperature, down to minus 67 degrees F.
 - 5. Glass-reinforced plastic pressure end plates.
- B. Sealing Compounds:
 - 1. Provide packing and sealing compound to fill pipe to sleeve thickness.
 - 2. Combined packing and sealing compounding to match partition fire-resistance hourly rating.
- C. Pipe Sleeve Material:
 - 1. Bearing Walls: Steel, cast iron, or terra-cotta pipe.
 - 2. Masonry Structures: Sheet metal or fiber.
- D. Wall Sleeve: PVC material with waterstop collar, and nailer end-caps.
- E. Sleeve-Forming Disk: Non-conductive plastic-based material, 3 inch thick.
- F. Pipeline-Casing Seals:
 - 1. Coated boltless casing-spacer for 4 inch carrier pipe.
 - 2. Coated boltless modular seal for 6 inch carrier pipe.
 - 3. Carbon steel band with risers for 12 inch carrier pipe.
 - 4. End Seals: 1/8 inch, pull-on type, rubber or synthetic rubber based.

PART 3 EXECUTION

3.01 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and foreign material, from inside and outside, before assembly.

3.02 INSTALLATION

- A. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
- B. Install piping to conserve building space, to not interfere with use of space and other work.
- C. Install piping and pipe sleeves to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- D. Structural Considerations: Do not penetrate building structural members unless indicated.
- E. Provide sleeves when penetrating footings, floors, walls, and partitions. Seal pipe including sleeve penetrations to achieve fire resistance equivalent to fire separation required.

1. Underground Piping: Caulk pipe sleeve watertight with mechanically expandable chloroprene inserts with bitumen sealed metal components.
 2. Aboveground Piping:
 - a. Pack solid using mineral fiber complying with ASTM C592.
 - b. Fill space with an elastomer caulk to a depth of 0.50 inch where penetrations occur between conditioned and unconditioned spaces.
 3. All Rated Openings: Caulk tight with fire stopping material complying with ASTM E814 in accordance with Section 07 8400 to prevent the spread of fire, smoke, and gases.
 4. Caulk exterior wall sleeves watertight with mechanically expandable chloroprene inserts with mastic-sealed components.
- F. Manufactured Sleeve-Seal Systems:
1. Install manufactured sleeve-seal systems in sleeves located in grade slabs and exterior concrete walls at piping entrances into building.
 2. Provide sealing elements of the size, quantity, and type required for the piping and sleeve inner diameter or penetration diameter.
 3. Locate piping in center of sleeve or penetration.
 4. Install field assembled sleeve-seal system components in annular space between sleeve and piping.
 5. Tighten bolting for a water-tight seal.
 6. Install in accordance with manufacturer's recommendations.
- G. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

3.03 CLEANING

- A. Upon completion of work, clean all parts of the installation.
- B. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.

END OF SECTION 22 0517

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**SECTION 22 0523
GENERAL-DUTY VALVES FOR PLUMBING PIPING**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Ball valves.

1.02 ABBREVIATIONS AND ACRONYMS

- A. CWP: Cold working pressure.
- B. EPDM: Ethylene propylene copolymer rubber.
- C. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.
- D. NRS: Non-rising stem.
- E. OS&Y: Outside screw and yoke.
- F. PTFE: Polytetrafluoroethylene.
- G. RS: Rising stem.
- H. TFE: Tetrafluoroethylene.
- I. WOG: Water, oil, and gas.
- J. WSP: Working steam pressure.

1.03 REFERENCE STANDARDS

- A. ASME B1.20.1 - Pipe Threads, General Purpose, Inch; 2013 (Reaffirmed 2018).
- B. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250; 2020.
- C. ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 Through NPS 24 Metric/Inch Standard; 2025.
- D. ASME B16.10 - Face-to-Face and End-to-End Dimensions of Valves; 2022, with Errata (2023).
- E. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2021.
- F. ASME B16.34 - Valves — Flanged, Threaded, and Welding End; 2025.
- G. ASME B31.9 - Building Services Piping; 2020.
- H. ASTM A536 - Standard Specification for Ductile Iron Castings; 2024.
- I. MSS SP-45 - Drain and Bypass Connections; 2020.
- J. MSS SP-72 - Ball Valves with Flanged or Butt-Welding Ends for General Service; 2010a.
- K. MSS SP-85 - Gray Iron Globe and Angle Valves, Flanged and Threaded Ends; 2011.
- L. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends; 2010, with Errata .
- M. NSF 61 - Drinking Water System Components - Health Effects; 2024.
- N. NSF 372 - Drinking Water System Components - Lead Content; 2024.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on valves including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
 - 1. Minimize exposure of operable surfaces by setting plug and ball valves to open position.
 - 2. Protect valve parts exposed to piped medium against rust and corrosion.
 - 3. Protect valve piping connections such as threads and flange faces.
- B. Use the following precautions during storage:

1. Maintain valve end protection and protect flanges and specialties from dirt.
 - a. Provide temporary inlet and outlet caps.
 - b. Maintain caps in place until installation.
2. Store valves in shipping containers and maintain in place until installation.
 - a. Store valves indoors in dry environment.
 - b. Store valves off the ground in watertight enclosures when indoor storage is not an option.

1.06 EXERCISE THE FOLLOWING PRECAUTIONS FOR HANDLING:

- A. Handle large valves with sling, modified to avoid damage to exposed parts.
- B. Avoid the use of operating handles or stems as rigging or lifting points.

PART 2 PRODUCTS

2.01 APPLICATIONS

- A. Listed pipe sizes shown using nominal pipe sizes (NPS) and nominal diameter (DN).
- B. Provide the following valves for the applications if not indicated on drawings:
 1. Shutoff: Ball.
 2. Throttling: Provide ball.
- C. Substitutions of valves with higher CWP classes or WSP ratings for same valve types are permitted when specified CWP ratings or WSP classes are not available.
- D. Required Valve End Connections for Non-Wafer Types:
 1. Steel Pipe:
 - a. 2 inch and Smaller: Threaded ends.
 - b. 2-1/2 inch to 4 inch: Grooved or flanged ends except where threaded valve-end option is indicated in valve schedules below.
 - c. 5 inch and Larger: Grooved or flanged ends.
 2. Copper Tube:
 - a. 2 inch and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
 - b. 2-1/2 inch to 4 inch: Grooved or flanged ends except where threaded valve-end option is indicated in valve schedules below.
 - c. 5 inch and Larger: Grooved or flanged ends.
- E. Domestic, Hot and Cold Water Valves:
 1. 2 inch and Smaller:
 - a. Bronze and Brass and Brass: Provide with solder-joint, solder-joint, or threaded ends.
 - b. Ball: One piece, full port, brass with brass trim.
 2. 2-1/2 inch and Larger:
 - a. Iron, 2-1/2 inch 2-1/2 inch to 4 inch 4 inch: Provide with threaded, threaded, or flanged ends.
 - b. Iron Ball: Class 150.

2.02 GENERAL REQUIREMENTS

- A. Valve Pressure and Temperature Ratings: No less than rating indicated; as required for system pressures and temperatures.
- B. Valve Sizes: Match upstream piping unless otherwise indicated.
- C. Valve Actuator Types:
 1. Hand Lever: Quarter-turn valves 6 inch 6 inch and smaller.
- D. Insulated Piping Valves: With 2 inch stem extensions and the following features:
 1. Ball Valves: Extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.

2. Memory Stops: Fully adjustable after insulation is installed.
- E. Valve-End Connections:
1. Threaded End Valves: ASME B1.20.1.
 2. Flanges on Iron Valves: ASME B16.1 for flanges on iron valves.
 3. Pipe Flanges and Flanged Fittings 1/2 inch through 24 inch: ASME B16.5.
 4. Solder Joint Connections: ASME B16.18.
- F. General ASME Compliance:
1. Ferrous Valve Dimensions and Design Criteria: ASME B16.10 and ASME B16.34.
 2. Solder-joint Connections: ASME B16.18.
 3. Building Services Piping Valves: ASME B31.9.
- G. Potable Water Use:
1. Certified: Approved for use in compliance with NSF 61 and NSF 372.
 2. Lead-Free Certified: Wetted surface material includes less than 0.25 percent lead content.
- H. Valve Bypass and Drain Connections: MSS SP-45.
- I. Source Limitations: Obtain each valve type from a single manufacturer.

2.03 BRASS, BALL VALVES

- A. One Piece, Full Port and Full Port with Brass Trim and Press, Threaded, Threaded, or Soldered Connections:
1. Comply with MSS SP-110.
 2. CWP Rating: 200 psi.
 3. Body: Forged brass.
 4. Seats: PTFE.
 5. Stem: Brass.
 6. Ball: Chrome-plated brass.
 7. Operator: Handle.
- B. Two Piece, Full Port with Brass Trim and Female Thread, Male thread, or Solder Connections:
1. Comply with MSS SP-110.
 2. WSP Rating: 150 psi.
 3. WOG Rating: 600 psi.
 4. Vacuum Rating: 28.9 in-Hg.
 5. Body: Forged brass, low lead compliant.
 6. Seats: PTFE.
 7. Leak and Blow-out Proof Stem: Brass Brass.
 8. Ball: Chrome-plated brass.
 9. Operator: Lockable handle, memory stop, and stem extension.
- C. Two Piece, Full Port with Press Connections:
1. WOG Rating: 250 psi.
 2. Body: Forged brass.
 3. Seats: EPDM.
 4. Ball: Chrome-plated brass.
 5. Leak and Blowout Proof Stem: Forged brass.
 6. Operator: Provide lockable handle, memory stop, and stem extension.
 7. Maximum Service Temperature: 250 degrees F.
- D. Three Piece, Full Port with Stainless Steel Trim:
1. Comply with MSS SP-110.
 2. WSP Rating: 150 psi.
 3. CWP Rating: 600 psi.
 4. Body: Forged brass.
 5. End Connections: Pipe thread.

6. Seats: PTFE.
7. Stem: Stainless steel.
8. Ball: Stainless steel, vented.
9. Operator: Provide lockable handle, memory stop, and stem extension.

2.04 BRONZE, BALL VALVES

- A. General:
 1. Fabricate from dezincification resistant material.
 2. Copper alloys containing more than 15 percent zinc are not permitted.
- B. One Piece, Reduced Port with Bronze Trim:
 1. Comply with MSS SP-110.
 2. WSP Rating: 400 psi.
 3. CWP Rating: 600 psi.
 4. Body: Bronze.
 5. End Connections: Pipe thread.
 6. Seats: PTFE.
 7. Stem: Bronze.
 8. Ball: Chrome plated brass.
 9. Operator: Provide lockable handle, memory stop, and stem extension.
- C. Two Piece, Full Port with Bronze Trim:
 1. Comply with MSS SP-110.
 2. WSP Rating: 150 psi.
 3. WOG Rating: 600 psi.
 4. Body: Forged bronze or dezincified-brass alloy.
 5. Ends Connections: Pipe press, thread, thread, solder, or solder.
 6. Seats: PTFE.
 7. Stem: Bronze, blowout proof.
 8. Ball: Chrome plated brass.
 9. Operator: Provide lockable handle, memory stop, and stem extension.
- D. Three Piece, Full Port with Stainless Steel Trim:
 1. Comply with MSS SP-110.
 2. WSP Rating: 150 psi.
 3. CWP Rating: 600 psi.
 4. Body: Bronze.
 5. End Connections: Pipe thread or press.
 6. Seats: PTFE.
 7. Stem: Stainless steel.
 8. Ball: Stainless steel, vented.
 9. Operator: Provide lockable handle, memory stop, and stem extension.

2.05 CARBON STEEL, BALL VALVES

- A. One Piece, Standard Port, Fire Safe, Class 150, Flanged with Stainless Steel Trim:
 1. WSP Rating: 150 psi, fire safe.
 2. Seats: TFM.
 3. Stem: Stainless steel, blowout proof.
 4. Ball: Stainless steel, vented.
 5. Operator: Lockable handle with stem extension with actuator-mounting pad.
 6. Pressure and Temperature Rating: ASME B16.34.
- B. Two Piece, Full Port with Stainless Steel Trim:
 1. Comply with MSS SP-110.
 2. WSP Rating: 150 psi.
 3. CWP Rating: 2,000 psi.

4. Seats: TFM.
 5. Stem: Stainless steel, blowout proof.
 6. Ball: Stainless steel, vented.
 7. End Connections: Threaded.
 8. Operator: Lockable handle with stem extension.
 9. Pressure and Temperature Rating: ASME B16.34.
- C. Two Piece, Full Port, Fire Safe, Class 150, Flanged with Stainless Steel Trim:
1. WSP Rating: 150 psi.
 2. Seats: TFM.
 3. Stem: Stainless steel, blowout proof.
 4. Ball: Stainless steel, vented.
 5. Operator: Lockable handle with actuator-mounting pad.
 6. Pressure and Temperature Rating: ASME B16.34.
- D. Three Piece, Full Port with Stainless Steel Trim:
1. Comply with MSS SP-110.
 2. WSP Rating: 250 psi.
 3. CWP Rating: 2,000 psi.
 4. Vacuum Rating: Down to 29.3 in-Hg.
 5. Seats: TFM.
 6. Stem: Stainless steel, blowout proof.
 7. Ball: Stainless steel, vented.
 8. Bolts: Stainless steel.
 9. End Connections: Threaded.
 10. Operator: Lockable handle with stem extension.
 11. Pressure and Temperature Rating: ASME B16.34.

2.06 STAINLESS STEEL, BALL VALVES

- A. One Piece, Standard Port with Stainless-Steel Trim:
1. Comply with MSS SP-110.
 2. WSP Rating: 150 psi.
 3. CWP Rating: 1,000 psi.
 4. Seats: PTFE.
 5. Stem: Stainless steel, blowout proof.
 6. Ball: Stainless steel.
 7. End Connections: Threaded or press.
 8. Operator: Lockable handle.
- B. One Piece, Standard Port, Class 150, Flanged with Stainless Steel Trim:
1. WSP Rating: 150 psi.
 2. Seats: TFM.
 3. Stem: Stainless steel, blowout proof.
 4. Ball: Stainless steel.
 5. Operator: Lockable handle with stem extension with actuator-mounting pad.
 6. Pressure and Temperature Rating: ASME B16.34.
- C. Two Piece, Full Port with Stainless Steel Trim:
1. Comply with MSS SP-110.
 2. WSP Rating: 150 psi.
 3. CWP Rating: 2,000 psi.
 4. Seats: PTFE.
 5. Stem: Stainless steel, blowout proof.
 6. Ball: Stainless steel, vented.
 7. End Connections: Threaded or press.
 8. Operator: Lockable handle with stem extension.

- D. Two Piece, Full Port, Fire Safe, Class 150, Flanged with Stainless Steel Trim:
 - 1. WSP Rating: 150 psi.
 - 2. Seats: TFM.
 - 3. Stem: Stainless steel, blowout proof.
 - 4. Ball: Stainless steel, vented.
 - 5. Operator: Lockable handle with actuator-mounting pad.
 - 6. Pressure and Temperature Rating: ASME B16.34.
- E. Three Piece, Full Port with Stainless Steel Trim:
 - 1. Comply with MSS SP-110.
 - 2. WSP Rating: 150 psi.
 - 3. WOG Rating: 2,000 psi.
 - 4. Vacuum Rating: 26.9 in-Hg.
 - 5. Seats: PFTE.
 - 6. Stem: Stainless steel, blowout proof.
 - 7. Ball: Stainless steel, vented.
 - 8. Bolts: Stainless steel.
 - 9. End Connections: Threaded or press.
 - 10. Operator: Lockable handle.
 - 11. Comply with ASME B16.34 for pressure-temperature range.

2.07 IRON, BALL VALVES

- A. Class 125, Full Port, Stainless Steel Trim:
 - 1. Comply with MSS SP-72.
 - 2. CWP Rating: 200 psi.
 - 3. Body: ASTM A536 Grade 65-45-12, ductile iron.
 - 4. End Connections: Flanged.
 - 5. Seats: PTFE.
 - 6. Stem: Stainless steel.
 - 7. Ball: Stainless steel.
 - 8. Operator: Lever with locking handle.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Discard all packing materials and verify that valve interior, including threads and flanges are completely clean without signs of damage or degradation that could result in leakage.
- B. Verify valve parts to be fully operational in all positions from closed to fully open.
- C. Confirm gasket material to be suitable for the service, to be of correct size, and without defects that could compromise effectiveness.
- D. Should valve is determined to be defective, replace with new valve.

3.02 INSTALLATION

- A. Provide unions or flanges with valves to facilitate equipment removal and maintenance while maintaining system operation and full accessibility for servicing.
- B. Provide separate valve support as required and locate valve with stem at or above center of piping, maintaining unimpeded stem movement.

END OF SECTION 22 0523

**SECTION 22 0529
HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Prefabricated trapeze-framed systems.
- B. Strut systems for pipe or equipment support.
- C. Beam clamps.
- D. Pipe hangers.
- E. Pipe rollers and roller supports.
- F. Pipe supports, guides, shields, and saddles.
- G. Retrofit piping cover system.
- H. Anchors and fasteners.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete equipment pads.
- B. Section 05 5000 - Metal Fabrications.

1.03 REFERENCE STANDARDS

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- C. ASTM A181/A181M - Standard Specification for Carbon Steel Forgings, for General-Purpose Piping; 2023.
- D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- E. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings; 1999, with Editorial Revision (2022).
- F. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2024.
- G. ASTM A395/A395M - Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures; 1999 (Reapproved 2022).
- H. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- I. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2023.
- J. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.
- K. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- L. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
- M. FM (AG) - FM Approval Guide; Current Edition.
- N. MFMA-4 - Metal Framing Standards Publication; 2004.
- O. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2018, with Amendment (2019).

- P. UL (DIR) - Online Certifications Directory; Current Edition.
- Q. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.
 - 2. Coordinate the work with other trades to provide additional framing and materials required for installation.
 - 3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
 - 4. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
 - 5. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Sequencing:
 - 1. Do not install products on or provide attachment to concrete surfaces until concrete has fully cured in accordance with Section 03 3000.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for metal channel (strut) framing systems, metal channel (strut) framing systems, post-installed concrete and masonry anchors, post-installed concrete and masonry anchors, thermal insulated pipe supports, and thermal insulated pipe supports.

1.06 QUALITY ASSURANCE

- A. Comply with applicable building code.
- B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Provide required hardware to hang or support piping, equipment, or fixtures with related accessories as necessary to complete installation of plumbing work.
- B. Provide hardware products listed, classified, and labeled as suitable for intended purpose.
- C. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported. Include consideration for vibration, equipment operation, and shock loads where applicable.
- D. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.
- E. Fire Resistance: Provide hardware rated for 60 minutes resistance unless specifically indicated by the authority having jurisdiction.
- F. Materials for Metal Fabricated Supports: Comply with Section 05 5000.
 - 1. Zinc-Plated Steel: Electroplated in accordance with ASTM B633 unless stated otherwise.
 - 2. Galvanized Steel: Hot-dip galvanized in accordance with ASTM A123/A123M or ASTM A153/A153M unless stated otherwise.

- G. Corrosion Resistance: Use corrosion-resistant metal-based materials fully compatible with exposed piping materials and suitable for the environment where installed.
 - 1. Indoor Dry Locations: Use zinc-plated steel or approved equivalent unless otherwise indicated.
 - 2. Outdoor, Damp, or Wet-Indoor Locations: Use galvanized steel, stainless steel, or approved equivalent unless otherwise indicated.

2.02 PREFABRICATED TRAPEZE-FRAMED SYSTEMS

- A. Prefabricated Trapeze-Framed Metal Strut Systems:
 - 1. MFMA-4 compliant, pre-fabricated, MSS SP-58 Type 59 continuous-slot metal strut channel with associated tracks, fittings, and related accessories.
 - 2. Strut Channel or Bracket Material:
 - a. Indoor Dry Locations: Use zinc-plated steel or galvanized steel.
 - b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel.
 - 3. Minimum Channel Thickness: Steel sheet, 12 gauge, 0.1046 inch.
 - 4. Minimum Channel Dimensions: 1-5/8 inch width by 13/16 inch height.
 - 5. Accessories: Provide bracket covers, cable basket clips, cable tray clips, clamps, conduit clamps, fire-retarding brackets, j-hooks, protectors, and vibration dampeners.

2.03 STRUT SYSTEMS FOR PIPE OR EQUIPMENT SUPPORT

- A. Strut Channels:
 - 1. ASTM A653/A653M galvanized steel bracket with clamps for surface mounting of piping or plumbing equipment support.
 - 2. Channel or Bracket Kits: Include rods, brackets, end-fixed fittings, covers, clips, and other related hardware required to complete sectional trapeze section for piping or other support.
- B. Hanger Rods:
 - 1. Threaded zinc-plated steel unless otherwise indicated.
 - 2. Minimum Size, Unless Otherwise Indicated or Required:
 - a. Equipment Supports: 1/2 inch diameter.
 - b. Piping up to 1 inch: 1/4 inch diameter.
 - c. Piping larger than 1 inch: 3/8 inch diameter.
 - d. Trapeze Support for Multiple Pipes: 3/8 inch in length.
- C. Channel Nuts:
 - 1. Provide carbon steel channel nut with epoxy copper or zinc finish and long, regular, or short spring as indicated on drawings.

2.04 BEAM CLAMPS

- A. MSS SP-58 types 19 through 23, 25 or 27 through 30 based on required load.
- B. C-Clamp: MSS SP-58 type 23, malleable iron and steel with plain, stainless steel, and zinc finish.
- C. Small or Junior Beam Clamp: MSS SP-58 type 19, malleable iron with plain finish. For inverted usage provide manufacturer listed size(s).
- D. Wide Mouth Beam Clamp: MSS SP-58 type 19, malleable iron with plain finish.
- E. Centerload Beam Clamp with Extension Piece: MSS SP-58 type 30, malleable iron with plain finish.
- F. FM (AG) and UL (DIR) Approved Beam Clamp: MSS SP-58 type 19, plain finish.
- G. Provide clamps with hardened steel cup-point set screws and lock-nuts for anchoring in place.
- H. Material: ASTM A395/A395M ductile iron, ASTM A36/A36M carbon steel, ASTM A47/A47M malleable iron, ASTM A181/A181M forged steel, or ASTM A283/A283M steel.

2.05 PIPE HANGERS

- A. Band Hangers, Adjustable:
 - 1. MSS SP-58 type 7 or 9, zinc-plated ASTM A1011/A1011M steel or ASTM A653/A653M carbon steel.
- B. J-Hangers, Adjustable:
 - 1. MSS SP-58 type 5, zinc-plated ASTM A1011/A1011M steel or ASTM A653/A653M carbon steel.
 - 2. Felt-Lined: Provide for uninsulated pipe to reduce noise and prevent static issues.
- C. Swivel Ring Hangers, Adjustable:
 - 1. MSS SP-58 type 10, epoxy-painted, zinc-colored.
 - 2. Material: ASTM A395/A395M ductile iron, ASTM A36/A36M carbon steel, ASTM A47/A47M malleable iron, ASTM A181/A181M forged steel, or ASTM A283/A283M steel.
 - 3. FM (AG) and UL (DIR) listed for specific pipe size runs and loads.
 - 4. Felt-Lined: Provide for uninsulated pipe to reduce noise and prevent static issues.
- D. Clevis Hangers, Adjustable:
 - 1. Copper Tube: MSS SP-58 type 1, epoxy-plated copper.
 - 2. Felt-Lined: MSS SP-58 type 1, zinc-plated, silicone-free carbon steel.
 - 3. Light-Duty: MSS SP-58 type 1, zinc-colored, epoxy plated.
 - 4. Standard-Duty: MSS SP-58 type 1, zinc-colored, epoxy plated.
 - 5. UL (DIR) listed: Pipe sizes 2-1/2 to 8 inch.
 - 6. FM (AG) listed: Pipe sizes 2-1/2 to 8 inch.
- E. Nonmetallic Pipe Hangers:
 - 1. CPVC fabricated, snap-action hanger for pendant or sidewall applications.

2.06 PIPE CLAMPS

- A. Riser Clamps:
 - 1. For insulated pipe runs, provide two bolt-type clamps designed for installation under insulation.
 - 2. MSS SP-58 type 1 or 8, carbon steel or steel with epoxy plated, plain, stainless steel, or zinc plated finish.
 - 3. Medium Split Horizontal Pipe Clamp: MSS SP-58 type 4, carbon steel or stainless steel with epoxy plated, plain, stainless steel, or zinc plated finish.
 - 4. Copper Tube Pipe Clamp: MSS SP-58 type 8, epoxy plated copper.
 - 5. UL (DIR) listed: Pipe sizes 1/2 to 8 inch.
- B. Extension Split Pipe Clamp:
 - 1. MSS SP-58 type 12, hinged split ring and yoke roller hanger with epoxy copper or plain finish.
 - 2. Material: ASTM A47/A47M malleable iron or ASTM A36/A36M carbon steel.
 - 3. Provide hanger rod and nuts of the same type and material for a given pipe run.
 - 4. Provide coated or plated hangers to isolate steel hangers from dissimilar metal tube or pipe.
- C. Offset Pipe Clamps: Double-leg design two-piece pipe clamp.
- D. Strut Clamps:
 - 1. Pipe Clamp: Two-piece rigid, universal, or outer diameter type, carbon steel with epoxy copper or zinc finish.
 - 2. Cushioned Pipe or Tubing Strut Clamp: Provide strut clamp with thermoplastic elastomer cushion having dielectric strength of 670 V/mil.
 - 3. Service Temperature Range: Minus 65 to 275 degrees F.
- E. Insulation Coupling:
 - 1. Two bolt-type clamps designed for installation under insulation.
 - 2. Material: Carbon steel with epoxy copper or zinc finish.

2.07 PIPE ROLLERS AND ROLLER SUPPORTS

- A. MSS SP-58 type 43 based on required load, nonconductive and corrosion resistant.
- B. Steel Yoke Type: MSS SP-58 type 44, vertically adjustable, nonconductive, and corrosion resistant.
- C. Material: Zinc plated ASTM A36/A36M carbon steel or ASTM A47/A47M malleable iron.

2.08 PIPE SUPPORTS, GUIDES, SHIELDS, AND SADDLES

- A. Dielectric Barriers: Provide between metallic supports and metallic piping and associated items of dissimilar type; acceptable dielectric barriers include rubber or plastic sheets or coatings attached securely to pipe or item.
- B. Stanchions:
 - 1. Material: Malleable iron, ASTM A47/A47M; or carbon steel, ASTM A36/A36M.
 - 2. Provide coated or plated saddles to isolate steel hangers from dissimilar metal tube or pipe.
 - 3. For pipe runs, use stanchions of same type and material where vertical adjustment is required for stationary pipe.
- C. U-Bolts:
 - 1. MSS SP-58 type 24, carbon steel u-bolt for pipe support or anchoring.
- D. Intermediate Anchors and Pipe Alignment Guides:
 - 1. Pipe Sizes 6 inch and Smaller: Minimum clearance of 0.16 inch.
 - 2. Pipe Size 8 inch: 0.625 inch U-bolt with double nuts providing minimum clearance of 0.28 inch.
 - 3. Pipe Size 10 inch: 0.75 inch U-bolt.
 - 4. Pipe Sizes 12 to 16 inch: 0.875 inch U-bolt.
 - 5. Pipe Sizes 18 to 30 inches: 1 inch U-bolt.
 - 6. Use pipe clamps with oversize pipe sleeve that provides clearance around pipe.
- E. Pipe Alignment Guides:
 - 1. Pipe Sizes 8 inch and Smaller: Spider or sleeve type.
 - 2. Pipe Sizes 10 inch and Larger: Roller type.
 - 3. Pipe Sizes 18 to 30 inch: 1 inch U-bolt.
- F. Pipe Shields for Insulated Piping:
 - 1. MSS SP-58 type 40, ASTM A1011/A1011M steel or ASTM A653/A653M carbon steel.
 - 2. General Construction and Requirements:
 - a. Surface Burning Characteristics: Comply with ASTM E84 or UL 723.
 - b. Shields Material: UV-resistant polypropylene with glass fill.
 - c. Maximum Insulated Pipe Outer Diameter: 12-5/8 inch.
 - d. Service Temperature: Minus 40 to 178 degrees F.
 - e. Pipe shields to be provided at hanger, support, and guide locations on pipe requiring insulation or additional support.
- G. Pipe Supports:
 - 1. Material: ASTM A395/A395M ductile iron, ASTM A36/A36M carbon steel, ASTM A47/A47M malleable iron, ASTM A181/A181M forged steel, or ASTM A283/A283M steel.
 - 2. Liquid Temperatures Up to 122 degrees F:
 - a. Overhead Support: MSS SP-58 types 1, 3 through 12 clamps.
 - b. Support From Below: MSS SP-58 types 35 through 38.
 - 3. Operating Temperatures from 122 to 446 degrees F:
 - a. Overhead Support: MSS SP-58 type 1 or 3 through 12 clamps with appropriate saddle of MSS SP-58 type 40 for insulated pipe.
 - b. Roller Chair: MSS SP-58 types 41 or 43 through 46 roller chair support with appropriate saddle of MSS SP-58 type 39 for insulated pipe.
 - c. Sliding Support: MSS SP-58 types 35 through 38.

- H. Pipe Supports, Thermal Insulated:
 - 1. General Requirements:
 - a. Insulated pipe supports to be provided at hanger, support, and guide locations on pipe requiring insulation or additional support.
 - b. Surface Burning Characteristics: Flame spread index/smoke developed index of 5/30, maximum, when tested in accordance with ASTM E84 or UL 723.
 - c. Provide pipe supports for 1/2 to 30 inch iron pipes.
 - d. Insulation inserts to consist of rigid phenolic foam insulation surrounded by 360 degree, PVC jacketing.
 - 2. PVC Jacket:
 - a. Pipe insulation protection shields to be provided with ball bearing hinge and locking seam.
 - b. Minimum Service Temperature: Minus 40 degrees F.
 - c. Maximum Service Temperature: 180 degrees F.
 - d. Moisture Vapor Transmission: 0.0071 perm inch, when tested in accordance with ASTM E96/E96M.
 - e. Minimum Thickness: 60 mil, 0.06 inch.
 - f. Connections: Brush-on welding adhesive.
- I. Thermal Insulated, Surface-Mounted Pipe Supports:
 - 1. Material: Carbon steel with epoxy copper or zinc finish.
 - 2. Weather and UV light resistant foam, plastic, or rubber material with built-in strut. Maximum Load: 50 lb for single pipe or multiple landed on top strut.

2.09 RETROFIT PIPING COVER SYSTEM

- A. General Requirements:
 - 1. Surface Burning Characteristics: Flame spread index/smoke developed index of 20/250, maximum, when tested in accordance with ASTM E84 or UL 723.
- B. Materials:
 - 1. Piping Cover System: Removal-resistant, modular, snap-fit cover units, clips, and anchors for use with CPVC, steel, and copper piping systems.
 - 2. Cover Units: L-shaped and U-shaped cross-section units of flame retardant resin material, paintable finish.
 - 3. Unit Length: Per manufacturer.
 - 4. Provide coupling fittings for joining units end to end and prefabricated inside and outside corner fittings and end caps as required.
 - 5. Provide mounting clips to secure covers to wall-ceiling per manufacturer requirements.

2.10 ANCHORS AND FASTENERS

- A. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.
- B. Concrete: Use preset concrete inserts, expansion anchors, or screw anchors.
- C. Solid or Grout-Filled Masonry: Use expansion anchors or screw anchors.
- D. Hollow Masonry: Use toggle bolts.
- E. Hollow Stud Walls: Use toggle bolts.
- F. Steel: Use beam ceiling clamps, beam clamps, machine bolts, or welded threaded studs.
- G. Beam Ceiling Flanges: ASTM A47/A47M Grade 32510, malleable iron or stainless steel with copper, plain, stainless steel, or zinc finish.
- H. Sheet Metal: Use sheet metal screws.
- I. Wood: Use wood screws.
- J. Plastic and lead anchors are not permitted.
- K. Powder-actuated fasteners are not permitted.

- L. Hammer-driven anchors and fasteners are not permitted.
- M. Preset Concrete Inserts: Continuous metal strut channel and spot inserts specifically designed to be cast in concrete ceilings, walls, and floors.
 - 1. Channel Material: Use galvanized steel.
 - 2. Minimum Channel Thickness: Steel sheet, 12 gauge, 0.1046 inch minimum base metal thickness.
 - 3. Manufacturer: Same as manufacturer of metal strut channel framing system.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that mounting surfaces are ready to receive support and attachment components.
- B. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Provide independent support from building structure. Do not provide support from piping, ductwork, conduit, or other systems.
- C. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.
- D. Unless specifically indicated or approved by Architect, do not provide support from roof deck.
- E. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
- F. Provide thermal insulated pipe supports complete with hangers and accessories. Install thermal insulated pipe supports during the installation of the piping system.
- G. Equipment Support and Attachment:
 - 1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
 - 2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
 - 3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
 - 4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
- H. Preset Concrete Inserts: Use manufacturer-provided closure strips to inhibit concrete seepage during concrete pour.
- I. Secure fasteners according to manufacturer's recommended torque settings.
- J. Remove temporary supports.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Inspect support and attachment components for damage and defects.
- C. Correct deficiencies and replace damaged or defective support and attachment components.

END OF SECTION 22 0529

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**SECTION 22 0553
IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Pipe markers.

1.02 RELATED REQUIREMENTS

- A. Section 09 9123 - Interior Painting: Identification painting.

1.03 REFERENCE STANDARDS

- A. ASME A13.1 - Scheme for the Identification of Piping Systems; 2023.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturers catalog literature for each product required.

PART 2 PRODUCTS**2.01 PLUMBING COMPONENT IDENTIFICATION GUIDELINE**

- A. Pipe Markers: 3/4 inch diameter and higher.

2.02 PIPE MARKERS

- A. Flexible Marker: Factory fabricated, semi-rigid, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid conveyed.
- B. Flexible Tape Marker: Flexible, vinyl film tape with pressure-sensitive adhesive backing and printed markings.
- C. Identification Scheme, ASME A13.1:
 - 1. Primary: External Pipe Diameter, Uninsulated or Insulated.
 - a. 3/4 to 1-1/4 inches: Use 8 inch field-length with 1/2 inch text height.
 - b. 1-1/2 to 2 inches: Use 8 inch field-length with 3/4 inch text height.
 - c. 2-1/2 to 6 inches: Use 12 inch field-length with 1-1/4 inch text height.
 - d. 8 to 10 inches: Use 24 inch field-length with 2-1/2 inch text height.
 - e. Over 10 inches: Use 32 inch field-length with 3-1/2 inch text height.
 - 2. Secondary: Color scheme per fluid service.
 - a. Water; Potable, Cooling, Boiler Feed, and Other: White text on green background.

PART 3 EXECUTION**3.01 PREPARATION**

- A. Degrease and clean surfaces to receive identification products.

3.02 INSTALLATION

- A. Install plastic pipe markers in accordance with manufacturer's instructions.
- B. Install plastic tape pipe marker around pipe in accordance with manufacturer's instructions.
- C. Apply ASME A13.1 Pipe Marking Rules:
 - 1. Place pipe marker adjacent to changes in direction.
 - 2. Place pipe marker adjacent each valve port and flange end.
 - 3. Place pipe marker at both sides of floor and wall penetrations.
 - 4. Place pipe marker every 25 to 50 feet interval of straight run.

END OF SECTION 22 0553

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**SECTION 22 0719
PLUMBING PIPING INSULATION**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Flexible elastomeric cellular insulation.
- B. Glass fiber insulation.
- C. Jacketing and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 07 8400 - Firestopping.

1.03 REFERENCE STANDARDS

- A. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2023.
- B. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- C. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2019, with Editorial Revision (2023).
- D. ASTM C195 - Standard Specification for Mineral Fiber Thermal Insulating Cement; 2007 (Reapproved 2019).
- E. ASTM C449 - Standard Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement; 2007 (Reapproved 2024).
- F. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form; 2025.
- G. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation; 2022a.
- H. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel; 2008 (Reapproved 2023).
- I. ASTM C1423 - Standard Guide for Selecting Jacketing Materials for Thermal Insulation; 2021.
- J. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- K. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
- L. SAE AMS3779 - Tape, Adhesive, Pressure-Sensitive Thermal Radiation Resistant; 1984, Reaffirmed 1994..
- M. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

1.06 FIELD CONDITIONS

- A. Maintain ambient conditions required by manufacturers of each product.
- B. Maintain temperature before, during, and after installation for minimum of 24 hours.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84, UL 723, ASTM E84, or UL 723.

2.02 GLASS FIBER INSULATION

- A. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible.
 - 1. K Value: ASTM C177, 0.24 at 75 degrees F.
 - 2. Maximum Service Temperature: 850 degrees F.
 - 3. Maximum Moisture Absorption: 0.2 percent by volume.
- B. Vapor Barrier Jacket: White Kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E96/E96M of 0.02 perm.
- C. Tie Wire: 0.048 inch stainless steel with twisted ends on maximum 12 inch centers.
- D. Vapor Barrier Lap Adhesive: Compatible with insulation.
- E. Insulating Cement/Mastic: ASTM C195; hydraulic setting on mineral wool.
- F. Fibrous Glass Fabric:
 - 1. Cloth: Untreated; 9 oz/sq yd weight.
 - 2. Blanket: 1.0 pcf density.
 - 3. Weave: 5 by 5.
- G. Indoor Vapor Barrier Finish:
 - 1. Cloth: Untreated; 9 oz/sq yd weight.
 - 2. Vinyl emulsion type acrylic, compatible with insulation, white color.
- H. Insulating Cement: ASTM C449.

2.03 FLEXIBLE ELASTOMERIC CELLULAR INSULATION

- A. Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 1; use molded tubular material wherever possible.
 - 1. Minimum Service Temperature: Minus 40 degrees F.
 - 2. Maximum Service Temperature: 220 degrees F.
 - 3. Connection: Waterproof vapor barrier adhesive.
- B. Elastomeric Foam Adhesive: Air dried, contact adhesive, compatible with insulation.

2.04 JACKETING AND ACCESSORIES

- A. PVC Plastic Jacket:
 - 1. Jacket: One piece molded type fitting covers and sheet material, off-white color.
 - a. Minimum Service Temperature: 0 degrees F.
 - b. Maximum Service Temperature: 150 degrees F.
 - c. Moisture Vapor Permeability: 0.002 perm inch, maximum, when tested in accordance with ASTM E96/E96M.
 - d. Thickness: 10 mil, 0.010 inch.
 - e. Connections: Brush on welding adhesive.
 - 2. Covering Adhesive Mastic: Compatible with insulation.
- B. Aluminum Jacket:
 - 1. Comply with ASTM B209/B209M, Temper H14, minimum thickness of 0.016 inch with factory-applied polyethylene and kraft paper moisture barrier on the inside surface.
 - 2. Thickness: 0.016 inch sheet.
 - 3. Finish: Smooth.
 - 4. Joining: Longitudinal slip joints and 2 inch laps.
 - 5. Fittings: 0.016 inch thick die-shaped fitting covers with factory-attached protective liner.
 - 6. Metal Jacket Bands: 3/8 inch wide; 0.015 inch thick aluminum.
- C. Stainless Steel Jacket: ASTM A666, Type 304 stainless steel.

1. Thickness: 0.010 inch.
 2. Finish: Smooth.
 3. Metal Jacket Bands: 3/8 inch wide; 0.010 inch thick stainless steel.
- D. Reinforced Tape:
1. FSK tape suitable for sealing seams between insulation, insulated pipe bends, and fittings resulting in a tight, smooth surface without wrinkles.
 2. Comply with UL 723 or ASTM E84.
 3. Moisture Vapor Permeability: 0.00 perm inch, when tested in accordance with ASTM E96/E96M.
 4. Finish: Match insulation.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that piping has been tested before applying insulation materials.
- B. Verify that surfaces are clean and dry, with foreign material removed.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with North American Insulation Manufacturers Association (NAIMA) National Insulation Standards.
- C. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, and expansion joints.
- D. Glass fiber insulated pipes conveying fluids below ambient temperature:
 1. Provide vapor barrier jackets, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure-sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.
 2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.
- E. For hot piping conveying fluids 140 degrees F or less, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation.
- F. For hot piping conveying fluids over 140 degrees F, insulate flanges and unions at equipment.
- G. Glass fiber insulated pipes conveying fluids above ambient temperature:
 1. Provide standard jackets, with or without vapor barrier, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure-sensitive adhesive. Secure with outward clinch expanding staples.
 2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.
- H. Inserts and Shields:
 1. Application: Piping 1-1/2 inches diameter or larger.
 2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
 3. Insert Location: Between support shield and piping and under the finish jacket.
 4. Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
 5. Insert Material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.
- I. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, see Section 07 8400.
- J. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet above finished floor): Finish with PVC jacket and fitting covers.

END OF SECTION 22 0719

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**SECTION 22 1005
PLUMBING PIPING AND PUMPS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Sanitary waste piping, buried within 5 feet of building.
- B. Sanitary waste piping, above grade.
- C. Domestic water piping, buried within 5 feet of building.
- D. Domestic water piping, above grade.

1.02 RELATED REQUIREMENTS

- A. Section 22 0516 - Expansion Fittings and Loops for Plumbing Piping.
- B. Section 22 0553 - Identification for Plumbing Piping and Equipment.
- C. Section 22 0719 - Plumbing Piping Insulation.

1.03 REFERENCE STANDARDS

- A. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2021.
- B. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2021.
- C. ASME B16.51 - Copper and Copper Alloy Press-Connect Pressure Fittings; 2021.
- D. ASME B31.9 - Building Services Piping; 2020.
- E. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings; 2021.
- F. ASTM B32 - Standard Specification for Solder Metal; 2020.
- G. ASTM B42 - Standard Specification for Seamless Copper Pipe, Standard Sizes; 2020.
- H. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2022.
- I. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric); 2020.
- J. ASTM B813 - Standard Specification for Water Flushable Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube; 2024.
- K. ASTM B828 - Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings; 2023.
- L. ASTM C564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings; 2020a.
- M. ASTM C1277 - Standard Specification for Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings; 2020.
- N. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems; 2020 (Reapproved 2024).
- O. ASTM D2665 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings; 2024.
- P. ASTM D2855 - Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets; 2020 (Reapproved 2024).
- Q. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2024, with Editorial Revision (2025).
- R. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- S. AWWA C651 - Disinfecting Water Mains; 2023.
- T. CISPI 301 - Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications; 2021.

- U. CISPI 310 - Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications; 2020.
- V. IAPMO (UPC) - Uniform Plumbing Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- W. IAPMO/ANSI/CAN Z1117 - Standard for Press Connections; 2022.
- X. ICC (IPC) - International Plumbing Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- Y. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2018, with Amendment (2019).
- Z. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends; 2010, with Errata .
- AA. NSF 61 - Drinking Water System Components - Health Effects; 2024.
- BB. NSF 372 - Drinking Water System Components - Lead Content; 2024.
- CC. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.

1.05 QUALITY ASSURANCE

- A. Perform work in accordance with applicable codes.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- B. Provide temporary protective coating on cast iron and steel valves.
- C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

1.07 FIELD CONDITIONS

- A. Do not install underground piping when bedding is wet or frozen.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Potable Water Supply Systems: Provide piping, pipe fittings, and solder and flux (if used), that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.
- B. Plenum-Installed Acid Waste Piping: Flame-spread index equal or below 25 and smoke-spread index equal or below 50 according to ASTM E84 or UL 723 tests.

2.02 SANITARY WASTE PIPING, BURIED WITHIN 5 FEET OF BUILDING

- A. Cast Iron Pipe: ASTM A74 extra heavy weight.
 - 1. Fittings: Cast iron.
 - 2. Joints: Hub-and-spigot, CISPI HSN compression type with ASTM C564 neoprene gaskets.
- B. PVC Pipe: ASTM D2665 or ASTM D3034.
 - 1. Fittings: PVC.
 - 2. Joints: Solvent welded, with ASTM D2564 solvent cement.

2.03 SANITARY WASTE PIPING, ABOVE GRADE

- A. Cast Iron Pipe: CISPI 301, hubless, service weight.
 - 1. Fittings: Cast iron.
 - 2. Joints: CISPI 310, neoprene gaskets and stainless steel clamp-and-shield assemblies.
- B. PVC Pipe: ASTM D2665.
 - 1. Fittings: PVC.
 - 2. Joints: Solvent welded, with ASTM D2564 solvent cement.

2.04 DOMESTIC WATER PIPING, BURIED WITHIN 5 FEET OF BUILDING

- A. Copper Pipe: ASTM B42, hard drawn.
 - 1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22 wrought copper and bronze.
 - 2. Joints: ASTM B32, alloy Sn95 solder.

2.05 DOMESTIC WATER PIPING, ABOVE GRADE

- A. Copper Pipe: ASTM B88 (ASTM B88M), Type L (B), Drawn (H).
 - 1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
 - 2. Joints: ASTM B32, alloy Sn95 solder.
 - 3. Mechanical Press Sealed Fittings: ASME B16.51 or IAPMO/ANSI/CAN Z1117, ICC (IPC), and IAPMO (UPC) approved, NSF 61 and NSF 372 certified, with EPDM seals.
 - 4. Testing: In accordance with ASTM C1277 and CISPI 310.

2.06 PIPE FLANGES, UNIONS, AND COUPLINGS

- A. Unions for Pipe Sizes 2 inches and Under:
 - 1. Ferrous Pipe: Class 150 malleable iron threaded unions.
 - 2. Copper Tube and Pipe: Class 150 bronze unions with soldered joints.
- B. No-Hub Couplings:
 - 1. Gasket Material: Neoprene complying with ASTM C564.
 - 2. Band Material: Stainless steel.
 - 3. Eyelet Material: Stainless steel.
- C. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

2.07 PIPE HANGERS AND SUPPORTS

- A. Provide hangers and supports that comply with MSS SP-58.
 - 1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
 - 2. Overhead Supports: Individual steel rod hangers attached to structure or to trapeze hangers.
 - a. Cold and Hot Pipe Sizes 6 inch and Larger: Double hangers.
 - 3. Trapeze Hangers: Welded steel channel frames attached to structure.
 - 4. Vertical Pipe Support: Steel riser clamp.
 - 5. Floor Supports: Concrete pier or steel pedestal with floor flange; fixture attachment.
- B. Plumbing Piping - Drain, Waste, and Vent:
 - 1. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.
 - 2. Hangers for Pipe Sizes 2 inch and Over: Carbon steel, adjustable, clevis.
 - 3. Wall Support for Pipe Sizes to 3 inch: Cast iron hook.
 - 4. Wall Support for Pipe Sizes 4 inch and Over: Welded steel bracket and wrought steel clamp.
 - 5. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 - 6. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
- C. Plumbing Piping - Water:
 - 1. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Malleable iron, adjustable swivel, split ring.

2. Hangers for Cold Pipe Sizes 2 inch and Over: Carbon steel, adjustable, clevis.
3. Hangers for Hot Pipe Sizes 2 to 4 inch: Carbon steel, adjustable, clevis.
4. Hangers for Hot Pipe Sizes 6 inch and Larger: Adjustable steel yoke, cast iron pipe roll, double hanger.
5. Wall Support for Pipe Sizes Up to 3 inch: Cast iron hook.
6. Wall Support for Pipe Sizes 4 inch and Larger: Welded steel bracket and wrought steel clamp.
7. Wall Support for Hot Pipe Sizes 6 inch and Larger: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron pipe roll.
8. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
9. Floor Support for Hot Pipe Sizes to 4 inch: Cast iron adjustable pipe saddle, locknut, nipple, floor flange, and concrete pier or steel support.
10. Floor Support for Hot Pipe Sizes 6 inch and Larger: Adjustable cast iron pipe roll and stand, steel screws, and concrete pier or steel support.
11. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

2.08 FIELD TESTS AND INSPECTIONS

- A. Verify and inspect systems according to requirements by the Authority Having Jurisdiction. In the absence of specific test and inspection procedures proceed as indicated below.
- B. Domestic Water Systems:
 1. Perform hydrostatic testing for leakage prior to system disinfection.
 2. Test Preparation: Close each fixture valve or disconnect and cap each connected fixture.
 3. General:
 - a. Fill the system with water and raise static head to 10 psi above service pressure. Minimum static head of 50 to 150 psi. As an exception, certain codes allow a maximum static pressure of 80 psi.
 4. Metal Piping Systems Subject to Freezing Conditions:
 - a. Inject 40 psi of compressed air into piping to spot check for leaks with liquid soap. Document and repair leaks as necessary.
 - b. Raise injected compressed air pressure to 1.5 times rated service pressure or minimum pressure of 100 psi for a duration of 2 hours and verify with a gauge that no perceptible pressure drop is measured.
- C. Test Results: Document and certify successful results, otherwise repair, document, and retest.

2.09 PIPE SLEEVE-SEAL SYSTEMS

- A. Modular Mechanical Seals:
 1. Elastomer-based interlocking links continuously fill annular space between pipe and wall-sleeve, wall or casing opening.
 2. Watertight seal between pipe and wall-sleeve, wall or casing opening.
 3. Size and select seal component materials in accordance to service requirements.
 4. Glass reinforced plastic pressure end plates.

2.10 BALL VALVES

- A. Construction, 4 inch 4 inch and Smaller: MSS SP-110, Class 150, 400 psi 400 psi CWP, bronze, bronze, ductile iron, or ductile iron body, 304 stainless steel, 304 stainless steel, chrome plated brass, or chrome plated brass ball, regular port, teflon seats and stuffing box ring, blow-out proof stem, lever handle with balancing stops with balancing stops, solder, threaded, or threaded ends with union with union.

PART 3 EXECUTION

3.01 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt, on inside and outside, before assembly.

- C. Prepare piping connections to equipment with flanges or unions.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- D. Install piping to maintain headroom, conserve space, and not interfere with use of space.
- E. Group piping whenever practical at common elevations.
- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. See Section 22 0516.
- G. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
 - 1. See Section 22 0719.
- H. Provide access where valves and fittings are not exposed.
- I. Install vent piping penetrating roofed areas to maintain integrity of roof assembly.
- J. Install bell and spigot pipe with bell end upstream.
- K. Install valves with stems upright or horizontal, not inverted. See Section 22 0523.
- L. Install water piping to ASME B31.9.
- M. Copper Pipe and Tube: Make soldered joints in accordance with ASTM B828, using specified solder, and flux meeting ASTM B813; in potable water systems use flux also complying with NSF 61 and NSF 372.
- N. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.
- O. Sleeve pipes passing through partitions, walls, and floors.
- P. Pipe Hangers and Supports:
 - 1. Install in accordance with ASME B31.9.
 - 2. Support horizontal piping as indicated.
 - 3. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
 - 4. Place hangers within 12 inches of each horizontal elbow.
 - 5. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
 - 6. Support vertical piping at every floor. Support riser piping independently of connected horizontal piping.
 - 7. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
 - 8. Provide copper plated hangers and supports for copper piping.
 - 9. Support cast iron drainage piping at every joint.
- Q. Pipe Sleeve-Seal Systems:
 - 1. Install manufactured sleeve-seal systems in sleeves located in grade slabs and exterior concrete walls at piping entrances into building.
 - 2. Provide sealing elements of the size, quantity, and type required for the piping and sleeve inner diameter or penetration diameter.
 - 3. Locate piping in center of sleeve or penetration.
 - 4. Install field assembled sleeve-seal system components in annular space between sleeve and piping.
 - 5. Tighten bolting for a watertight seal.
 - 6. Install in accordance with manufacturer's recommendations.

- R. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

3.03 APPLICATION

- A. Install unions downstream of valves and at equipment or apparatus connections.
- B. Install gate or ball valves for shut-off and to isolate equipment, part of systems, or vertical risers.
- C. Install {CH#83196} valves for throttling, bypass, or manual flow control services.

3.04 TOLERANCES

- A. Drainage Piping: Establish invert elevations within 1/2 inch vertically of location indicated and slope to drain at minimum of 1/4 inch per foot slope.
- B. Water Piping: Slope at minimum of 1/32 inch per foot and arrange to drain at low points.

3.05 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Prior to starting work, verify system is complete, flushed, and clean.
- B. Ensure acidity (pH) of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
- C. Inject disinfectant, free chlorine in liquid, powder, tablet, or gas form throughout system to obtain 50 to 80 mg/L residual.
- D. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.
- E. Maintain disinfectant in system for 24 hours.
- F. If final disinfectant residual tests less than 25 mg/L, repeat treatment.
- G. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.
- H. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

END OF SECTION 22 1005

**SECTION 22 1006
PLUMBING PIPING SPECIALTIES**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Water hammer arrestors.
- B. Mixing valves.
- C. Relief valves.
- D. Air vents.

1.02 REFERENCE STANDARDS

- A. ASSE 1070 - Performance Requirements for Water Temperature Limiting Devices; 2020.
- B. NSF 61 - Drinking Water System Components - Health Effects; 2024.
- C. NSF 372 - Drinking Water System Components - Lead Content; 2024.
- D. PDI-WH 201 - Water Hammer Arresters; 2017.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Accept specialties on site in original factory packaging. Inspect for damage.

PART 2 PRODUCTS**2.01 GENERAL REQUIREMENTS**

- A. Specialties in Potable Water Supply Systems: Provide products that comply with NSF 61 and NSF 372 for maximum lead content.

2.02 WATER HAMMER ARRESTORS

- A. Water Hammer Arrestors:
 - 1. Stainless steel construction, bellows type sized in accordance with PDI-WH 201, precharged suitable for operation in temperature range minus 100 to 300 degrees F and maximum 250 psi working pressure.

2.03 MIXING VALVES

- A. Water Temperature Limiting Valves:
 - 1. Valve: ASSE 1070, bronze or brass body; thermostatic element; corrosion- and lime-resistant internal components; integral locking temperature adjustment with high-temperature limit stop; integral check valves with strainer screens on inlets.

2.04 RELIEF VALVES

- A. Bronze body, teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, capacities ASME certified and labelled.

2.05 AIR VENTS

- A. Manual Type: Short vertical sections of 2 inch diameter pipe to form air chamber, with 1/8 inch brass needle valve at top of chamber.
- B. Float Type:
 - 1. Brass or semi-steel body, copper, polypropylene, or solid non-metallic float, stainless steel valve and valve seat; suitable for system operating temperature and pressure; with isolating valve.
 - 2. Cast iron body and cover, float, bronze pilot valve mechanism suitable for system operating temperature and pressure; with isolating valve.

C. Washer Type:

1. Brass with hygroscopic fiber discs, vent ports, adjustable cap for manual shut-off, and integral spring loaded ball check valve.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install water hammer arrestors complete with accessible isolation valve on hot and cold water supply piping to lavatory sinks or water closets, urinals.

END OF SECTION 22 1006

**SECTION 22 4000
PLUMBING FIXTURES****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Existing plumbing fixtures
- B. Electric water coolers.

1.02 REFERENCE STANDARDS

- A. ASHRAE Std 18 - Methods of Testing for Rating Drinking-Water Coolers with Self-Contained Mechanical Refrigeration; 2008 (Reaffirmed 2013).
- B. NSF 61 - Drinking Water System Components - Health Effects; 2024.
- C. NSF 372 - Drinking Water System Components - Lead Content; 2024.
- D. UL (DIR) - Online Certifications Directory; Current Edition.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Accept fixtures on-site in factory packaging. Inspect for damage.
- B. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

1.05 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS**2.01 GENERAL REQUIREMENTS**

- A. Potable Water Systems: Provide plumbing fittings and faucets that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.

2.02 REGULATORY REQUIREMENTS

- A. Comply with applicable codes for installation of plumbing systems.
- B. Comply with UL (DIR) requirements.
- C. Perform work in accordance with local health department regulations.

2.03 EXISTING PLUMBING FIXTURES

- A. The existing plumbing fixtures are to be temporarily removed and reinstalled as indicated on the drawings. Each fixture shall be inspected for problems and thoroughly cleaned before reinstallation.

2.04 ELECTRIC WATER COOLERS

- A. Water Cooler: Electric, mechanically refrigerated; surface mounted, ADA compliant; stainless steel top, vinyl on steel body, elevated anti-squirt bubbler with stream guard, automatic stream regulator, push button, mounting bracket; integral air cooled condenser and stainless steel grille.
- B. Capacity: 8 gph of 50 degrees F water with inlet at 80 degrees F and room temperature of 90 degrees F, when tested in accordance with ASHRAE Std 18.
- C. Electrical: 115 VAC, 60 Hertz compressor, 6 foot cord and plug for connection to electric wiring system including grounding connector.
- D. Bottle Filler (where indicated on drawings): Materials to match fountain.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that walls and floor finishes are prepared and ready for installation of fixtures.
- B. Verify that electric power is available and of the correct characteristics.
- C. Confirm that millwork is constructed with adequate provision for the installation of counter top lavatories and sinks.

3.02 INSTALLATION

- A. Install each fixture with trap, easily removable for servicing and cleaning.
- B. Provide chrome-plated rigid or flexible supplies to fixtures with loose key stops, reducers, and escutcheons.
- C. Install components level and plumb.
- D. Install and secure fixtures in place with wall carriers and bolts.

3.03 INTERFACE WITH WORK OF OTHER SECTIONS

- A. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.

3.04 ADJUSTING

- A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

3.05 CLEANING

- A. Clean plumbing fixtures and equipment.

3.06 PROTECTION

- A. Protect installed products from damage due to subsequent construction operations.
- B. Do not permit use of fixtures by construction personnel.
- C. Repair or replace damaged products before Date of Substantial Completion.

END OF SECTION 22 4000

**SECTION 23 0529
HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Support and attachment components.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete equipment pads.
- B. Section 05 5000 - Metal Fabrications: Materials and requirements for fabricated metal supports.

1.03 REFERENCE STANDARDS

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- C. ASTM A181/A181M - Standard Specification for Carbon Steel Forgings, for General-Purpose Piping; 2023.
- D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- E. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings; 1999, with Editorial Revision (2022).
- F. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2024.
- G. ASTM A395/A395M - Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures; 1999 (Reapproved 2022).
- H. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- I. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.
- J. FM (AG) - FM Approval Guide; Current Edition.
- K. MFMA-4 - Metal Framing Standards Publication; 2004.
- L. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2018, with Amendment (2019).
- M. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.
 - 2. Coordinate the work with other trades to provide additional framing and materials required for installation.
 - 3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
 - 4. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
 - 5. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Sequencing:

1. Do not install products on or provide attachment to concrete surfaces until concrete has fully cured in accordance with Section 03 3000.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for channel (strut) framing systems and channel (strut) framing systems.

1.06 QUALITY ASSURANCE

- A. Comply with applicable building code.
- B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 SUPPORT AND ATTACHMENT COMPONENTS

- A. General Requirements:
 1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of plumbing work.
 2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
 3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported with a minimum safety factor of _____. Include consideration for vibration, equipment operation, and shock loads where applicable.
 4. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.
 5. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
 - a. Indoor Dry Locations: Use zinc-plated steel or approved equivalent unless otherwise indicated.
 - b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel, stainless steel, or approved equivalent unless otherwise indicated.
 - c. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
 - d. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.
- B. Materials for Metal Fabricated Supports: Comply with Section 05 5000.
- C. Prefabricated Trapeze-Framed Metal Strut Systems:
 1. MFMA-4 compliant, pre-fabricated, MSS SP-58 type 59 continuous-slot metal strut channel with associated tracks, fittings, and related accessories.
 2. Strut Channel or Bracket Material:
 - a. Indoor Dry Locations: Use painted steel, zinc-plated steel, or galvanized steel.
 - b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel.
 3. Minimum Channel Thickness: Steel sheet, 12 gauge, 0.1046 inch.
 4. Minimum Channel Dimensions: 1-5/8 inch width by 13/16 inch height.
 5. Accessories: Provide bracket covers, cable basket clips, cable tray clips, clamps, conduit clamps, fire-retarding brackets, j-hooks, protectors, and vibration dampeners.
- D. Strut Channels:
 1. ASTM A653/A653M galvanized steel bracket with clamps for surface mounting of piping or plumbing equipment support.

2. Channel or Bracket Kits: Include rods, brackets, end-fixed fittings, covers, clips, and other related hardware required to complete sectional trapeze section for piping or other support.
- E. Channel Nuts:
1. Provide carbon steel channel nut with epoxy copper or zinc finish and long, regular, or short spring.
- F. Hanger Rods:
1. Threaded zinc-plated steel unless otherwise indicated.
 2. Minimum Size, Unless Otherwise Indicated or Required:
 - a. Equipment Supports: 1/2 inch diameter.
- G. Beam Clamps:
1. MSS SP-58 types 19 through 23, 25 or 27 through 30 based on required load.
 2. Beam C-Clamp: MSS SP-58 type 23, malleable iron and steel with plain, stainless steel, and zinc finish.
 3. Small or Junior Beam Clamp: MSS SP-58 type 19, malleable iron with plain finish. For inverted usage provide manufacturer listed size(s).
 4. Wide Mouth Beam Clamp: MSS SP-58 type 19, malleable iron with plain finish.
 5. Centerload Beam Clamp with Extension Piece: MSS SP-58 type 30, malleable iron with plain finish.
 6. FM (AG) and UL (DIR) Approved Beam Clamp: MSS SP-58 type 19, plain finish,
 7. Provide clamps with hardened steel cup-point set screws and lock-nuts for anchoring in place.
 8. Material: ASTM A395/A395M ductile iron, ASTM A36/A36M carbon steel, ASTM A47/A47M malleable iron, ASTM A181/A181M forged steel, or ASTM A283/A283M steel.
- H. Dielectric Barriers: Provide between metallic supports and metallic piping and associated items of dissimilar type; acceptable dielectric barriers include rubber or plastic sheets or coatings attached securely to pipe or item.
- I. Anchors and Fasteners:
1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.
 2. Concrete: Use preset concrete inserts, expansion anchors, or screw anchors.
 3. Solid or Grout-Filled Masonry: Use expansion anchors or screw anchors.
 4. Hollow Masonry: Use toggle bolts.
 5. Hollow Stud Walls: Use toggle bolts.
 6. Steel: Use beam-ceiling clamps, beam clamps, machine bolts, or welded threaded studs.
 7. Beam Ceiling Flanges: ASTM A47/A47M Grade 32510, malleable iron or stainless steel with copper, plain, stainless steel, or zinc finish.
 8. Sheet Metal: Use sheet metal screws.
 9. Wood: Use wood screws.
 10. Plastic and lead anchors are not permitted.
 11. Powder-actuated fasteners are not permitted.
 12. Hammer-driven anchors and fasteners are not permitted.
 13. Preset Concrete Inserts: Continuous metal channel (strut) and spot inserts specifically designed to be cast in concrete ceilings, walls, and floors.
 - a. Comply with MFMA-4.
 - b. Channel Material: Use galvanized steel.
 - c. Minimum Channel Thickness: Steel sheet, 12 gauge, 0.1046 inch minimum base metal thickness.
 - d. Manufacturer: Same as manufacturer of metal channel (strut) framing system.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that mounting surfaces are ready to receive support and attachment components.
- B. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Provide independent support from building structure. Do not provide support from piping, ductwork, conduit, or other systems.
- C. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.
- D. Unless specifically indicated or approved by Architect, do not provide support from roof deck.
- E. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
- F. Equipment Support and Attachment:
 - 1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
 - 2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
 - 3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
 - 4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
- G. Preset Concrete Inserts: Use manufacturer-provided closure strips to inhibit concrete seepage during concrete pour.
- H. Secure fasteners according to manufacturer's recommended torque settings.
- I. Remove temporary supports.

END OF SECTION 23 0529

**SECTION 23 0593
TESTING, ADJUSTING, AND BALANCING FOR HVAC**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Testing, adjustment, and balancing of air systems.

1.02 REFERENCE STANDARDS

- A. AABC (NSTSB) - AABC National Standards for Total System Balance, 7th Edition; 2016.
- B. ASHRAE Std 111 - Measurement, Testing, Adjusting, and Balancing of Building HVAC Systems; 2024.
- C. SMACNA (TAB) - HVAC Systems Testing, Adjusting and Balancing; 2023.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Final Report: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
 - 1. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Architect and for inclusion in operating and maintenance manuals.
 - 2. Include actual instrument list, with manufacturer name, serial number, and date of calibration.
 - 3. Form of Test Reports: Where the TAB standard being followed recommends a report format use that; otherwise, follow ASHRAE Std 111.
 - 4. Units of Measure: Report data in I-P (inch-pound) units only.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION****3.01 GENERAL REQUIREMENTS**

- A. Perform total system balance in accordance with one of the following:
 - 1. AABC (NSTSB), AABC National Standards for Total System Balance.
 - 2. ASHRAE Std 111, Practices for Measurement, Testing, Adjusting and Balancing of Building Heating, Ventilation, Air-Conditioning, and Refrigeration Systems.
 - 3. SMACNA (TAB).
- B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work prior to Substantial Completion of the project.
- C. Where HVAC systems and/or components interface with life safety systems, including fire and smoke detection, alarm, and control, coordinate scheduling and testing and inspection procedures with the authorities having jurisdiction.
- D. TAB Agency Qualifications:
 - 1. Company specializing in the testing, adjusting, and balancing of systems specified in this section.
 - 2. Certified by one of the following:
 - a. AABC, Associated Air Balance Council: www.aabc.com/#sle; upon completion submit AABC National Performance Guaranty.
 - b. NEBB, National Environmental Balancing Bureau: www.nebb.org/#sle.
 - c. TABB, The Testing, Adjusting, and Balancing Bureau of National Energy Management Institute: www.tabbcertified.org/#sle.
- E. TAB Supervisor and Technician Qualifications: Certified by same organization as TAB agency.

3.02 EXAMINATION

- A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:

1. Systems are started and operating in a safe and normal condition.
2. Proper thermal overload protection is in place for electrical equipment.
3. Air outlets are installed and connected.
4. Duct system leakage is minimized.

3.03 ADJUSTMENT TOLERANCES

- A. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.

3.04 RECORDING AND ADJUSTING

- A. Ensure recorded data represents actual measured or observed conditions.
- B. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
- C. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
- D. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

3.05 AIR SYSTEM PROCEDURE

- A. Measure air quantities at air inlets and outlets.
- B. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.
- C. Use volume control devices to regulate air quantities only to extend that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.
- D. Vary branch air quantities by damper regulation.
- E. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.

END OF SECTION 23 0593

**SECTION 23 0713
DUCT INSULATION****<<<< UPDATE NOTES****PART 1 GENERAL****2.01 SECTION INCLUDES**

- A. Duct insulation.

2.02 RELATED REQUIREMENTS

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

2.03 REFERENCE STANDARDS

- A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.
- B. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form; 2025.
- C. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2024.
- D. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2014 (Reapproved 2019).
- E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- F. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
- G. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

2.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

2.05 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site in original factory packaging, labelled with manufacturer's identification, including product density and thickness.
- B. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

2.06 FIELD CONDITIONS

- A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.
- B. Maintain temperature during and after installation for minimum period of 24 hours.

PART 2 PRODUCTS**3.01 REGULATORY REQUIREMENTS**

- A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84, UL 723, ASTM E84, or UL 723.

3.02 GLASS FIBER, FLEXIBLE

- A. Insulation: ASTM C553; flexible, noncombustible blanket.
 1. K value: 0.36 at 75 degrees F, when tested in accordance with ASTM C518.
 2. Maximum Service Temperature: 1,200 degrees F.
 3. Maximum Water Vapor Absorption: 5.0 percent by weight.

- B. Vapor Barrier Jacket:
 - 1. Kraft paper with glass fiber yarn and bonded to aluminized film.
 - 2. Moisture Vapor Permeability: 0.02 perm inch, when tested in accordance with ASTM E96/E96M.
 - 3. Secure with pressure-sensitive tape.
- C. Vapor Barrier Tape:
 - 1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure-sensitive rubber-based adhesive.
- D. Indoor Vapor Barrier Mastic:
 - 1. Vinyl emulsion type acrylic or mastic, compatible with insulation, whit color.

3.03 GLASS FIBER, RIGID

- A. Insulation: ASTM C612; rigid, noncombustible.
 - 1. K Value: 0.24 at 75 degrees F, when tested in accordance with ASTM C518.
 - 2. Maximum Service Temperature: 450 degrees F.
 - 3. Maximum Water Vapor Absorption: 5.0 percent.
 - 4. Maximum Density: 8.0 pcf.
- B. Vapor Barrier Jacket:
 - 1. Kraft paper with glass fiber yarn and bonded to aluminized film.
 - 2. Moisture Vapor Permeability: 0.02 perm inch, when tested in accordance with ASTM E96/E96M.
 - 3. Secure with pressure-sensitive tape.
- C. Vapor Barrier Tape:
 - 1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure-sensitive rubber-based adhesive.
- D. Indoor Vapor Barrier Finish:
 - 1. Cloth: Untreated; 9 oz/sq yd weight, glass fabric.
 - 2. Vinyl emulsion type acrylic, compatible with insulation, white color.

3.04 FLEXIBLE ELASTOMERIC CELLULAR INSULATION

- A. Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 1, in sheet form.
 - 1. Minimum Service Temperature: Minus 40 degrees F.
 - 2. Maximum Service Temperature: 180 degrees F.
 - 3. Connection: Waterproof vapor barrier adhesive.
- B. Elastomeric Foam Adhesive: Air dried, contact adhesive, compatible with insulation.

PART 3 EXECUTION

4.01 EXAMINATION

- A. Test ductwork for design pressure prior to applying insulation materials.
- B. Verify that surfaces are clean, foreign material removed, and dry.

4.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with NAIMA National Insulation Standards.
- C. Insulated Ducts Conveying Air Below Ambient Temperature:
 - 1. Provide insulation with vapor barrier jackets.
 - 2. Finish with tape and vapor barrier jacket.
 - 3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
 - 4. Insulate entire system, including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.

- D. Insulated Ducts Conveying Air Above Ambient Temperature:
1. Provide with or without standard vapor barrier jacket.
 2. Insulate fittings and joints. Where service access is required, bevel and seal ends of insulation.

END OF SECTION 23 0713

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**SECTION 23 3100
HVAC DUCTS AND CASINGS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Metal ducts.
- B. Flexible ducts.

1.02 RELATED REQUIREMENTS

- A. Section 23 0713 - Duct Insulation: External insulation and duct liner.

1.03 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- D. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.
- E. NFPA 90B - Standard for the Installation of Warm Air Heating and Air-Conditioning Systems; 2024.
- F. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.
- G. UL 181 - Standard for Factory-Made Air Ducts and Air Connectors; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data for duct materials.

1.05 FIELD CONDITIONS

- A. Do not install duct sealants when temperatures are less than those recommended by sealant manufacturers.
- B. Maintain temperatures within acceptable range during and after installation of duct sealants.

1.06 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS**2.01 GENERAL REQUIREMENTS**

- A. Provide UL Class 1 ductwork, fittings, hangers, supports, and appurtenances in accordance with NFPA 90A and SMACNA (DCS) guidelines unless stated otherwise.
- B. Provide metal duct unless otherwise indicated.
- C. Duct Shape and Material in accordance with Allowed Static Pressure Range:
 - 1. Round: Plus or minus 2 in-wc of galvanized steel.
 - 2. Rectangular: Plus or minus 2 in-wc of galvanized steel.
- D. Duct Sealing and Leakage:
 - 1. Seal: Class A, apply sealing of transverse joints, longitudinal seams, and duct wall penetrations.
 - a. Leakage:
 - 1) Rectangular: Class 6 or 6 cfm/100 sq ft.
 - 2) Round: Class 3 or 3 cfm/100 sq ft.
- E. Duct Fabrication Requirements:

1. Duct and Fitting Fabrication and Support: SMACNA (DCS) including specifics for continuously welded round and oval duct fittings.
2. Use reinforced and sealed sheet-metal materials at recommended gauges for indicated operating pressures or pressure class.
3. Construct tees, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows must be used, provide airfoil turning vanes of perforated metal with glass fiber insulation.
4. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.

2.02 METAL DUCTS

- A. Material Requirements:
 1. Galvanized Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G60/Z180 coating.
- B. Rectangular Metal Duct:
 1. Rectangular Single Wall: Rectangular, longitudinal lock seam duct with galvanized steel wall.
- C. Round Metal Ducts:
 1. Round Single Wall Duct: Round lock seam duct with galvanized steel wall.
 2. Round Connection System: Interlocking duct connection system in accordance with SMACNA (DCS).
- D. Round Spiral Duct:
 1. Round spiral lock seam duct with galvanized steel wall.
- E. Connectors, Fittings, Sealants, and Miscellaneous:
 1. Fittings: Manufacture with solid wall of galvanized steel.
 2. Transverse Duct Connection System: SMACNA "E" rated rigid class connection, interlocking angle and duct edge connection system with sealant, gasket, cleats, and corner clips in accordance with SMACNA (DCS).
 3. Joint Sealers and Sealants: Non-hardening, water resistant, mildew and mold resistant.
 - a. Type: Heavy mastic or liquid used alone or with tape, suitable for joint configuration and compatible with substrates, and recommended by manufacturer for pressure class of ducts.
 - b. VOC Content: Not more than 250 g/L, excluding water.
 - c. Surface Burning Characteristics: Flame spread index of zero and smoke developed index of zero, when tested in accordance with ASTM E84.
 - d. For Use with Flexible Ducts: UL labeled.
 4. Gasket Tape:
 - a. Provide butyl rubber gasket tape for a flexible seal between transfer duct connector (TDC), transverse duct flange (TDF), applied flange connections, and angle ring connections.
 5. Hanger Rod: ASTM A36/A36M; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.

2.03 FLEXIBLE DUCTS

- A. Flexible Ducts: UL 181, Class 1, polyethylene film, mechanically fastened and rolled using galvanized steel to form spiral helix.
 1. Insulation: R6 insulation with polyethylene vapor barrier film.
 2. Pressure Rating: 10 in-wc positive and 5 in-wc negative.
 3. Maximum Velocity: 5500 fpm.
 4. Temperature Range: Minus 20 degrees F to 250 degrees F.
- B. Acoustic Flexible Ducts: UL 181, Class 1, spunbond nylon, mechanically fastened and rolled using galvanized steel to form spiral helix.

1. Insulation: Fiberglass insulation with metallic vapor barrier.
2. Inner Core: Spunbonded, nonwoven inner core.
3. Pressure Rating: 6 in-wc positive and 5 in-wc negative.
4. Maximum Velocity: 4000 fpm.
5. Temperature Range: Minus 20 degrees F to 250 degrees F.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install, support, and seal ducts in accordance with SMACNA (DCS).
- B. Install products following the manufacturer's instructions.
- C. Comply with safety standards NFPA 90A and NFPA 90B.
- D. During construction, provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering the ductwork system.
- E. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
- F. Flexible Ducts: Connect to metal ducts with adhesive.
- G. Duct sizes indicated are precise inside dimensions. For lined ducts, maintain sizes inside lining.
- H. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
- I. Use crimp joints with or without bead for joining round duct sizes 8 inch and smaller with a crimp in the direction of airflow.
- J. Use double nuts and lock washers on threaded rod supports.
- K. Connect diffusers or light troffer boots to low-pressure ducts directly or with 5 feet maximum length of flexible duct held in place with strap or clamp.
- L. Duct Insulation: Provide duct insulation. See Section 23 0713.

END OF SECTION 23 3100

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**SECTION 23 3300
AIR DUCT ACCESSORIES**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Volume control dampers.
- B. Miscellaneous Products:
 - 1. Duct opening closure film.

1.02 RELATED REQUIREMENTS

- A. Section 23 3100 - HVAC Ducts and Casings.

1.03 REFERENCE STANDARDS

- A. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2024.
- B. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2020.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide for shop-fabricated assemblies including volume control dampers.

PART 2 PRODUCTS**2.01 VOLUME CONTROL DAMPERS**

- A. Fabricate in accordance with SMACNA (DCS) and as indicated.
- B. Single Blade Dampers:
 - 1. Fabricate for duct sizes up to 6 by 30 inch.
 - 2. Blade: 24 gauge, 0.0239 inch, minimum.
- C. Multi-Blade Damper: Fabricate consisting of opposed blades with maximum blade sizes 8 by 72 inches. Assemble center- and edge-crimped blades in prime-coated or galvanized-channel frame with suitable hardware.
 - 1. Blade: 18 gauge, 0.0478 inch, minimum.
- D. End Bearings: Except in round ducts 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon, thermoplastic elastomer, or sintered bronze bearings.
- E. Quadrants:
 - 1. Provide locking, indicating quadrant regulators on single and multi-blade dampers.
 - 2. On insulated ducts mount quadrant regulators on stand-off mounting brackets, bases, or adapters.
 - 3. Where rod lengths exceed 30 inches provide regulator at both ends.

2.02 MISCELLANEOUS PRODUCTS

- A. Duct Opening Closure Film: Mold-resistant, self-adhesive film to keep debris out of ducts during construction.
 - 1. Thickness: 2 mils.
 - 2. High tack water based adhesive.
 - 3. UV stable light blue color.
 - 4. Elongation Before Break: 325 percent, minimum.

PART 3 EXECUTION**3.01 INSTALLATION**

- A. Install accessories in accordance with manufacturer's instructions, NFPA 90A, and follow SMACNA (DCS). See Section 23 3100 for duct construction and pressure class.

- B. Provide balancing dampers at points on supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Install minimum two duct widths from duct take-off.
- C. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, unless dampers are specified as part of the diffuser, grille, or register assembly.

END OF SECTION 23 3300

**SECTION 23 3700
AIR OUTLETS AND INLETS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Diffusers:
- B. Rectangular ceiling diffusers.

1.02 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

PART 2 PRODUCTS

2.01 RECTANGULAR CEILING DIFFUSERS

- A. Type: Provide square formed adjustable, backpan stamped, core removable, and multi-louvered ceiling diffusers constructed to maintain 360 degree discharge air pattern.
- B. Connections: Round.
- C. Frame: Provide inverted T-bar type.
- D. Fabrication: Steel with baked enamel finish.
- E. Color: Match existing.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Check location of outlets and inlets and make necessary adjustments in position to comply with architectural features, symmetry, and lighting arrangement.
- C. Install diffusers to ductwork with air tight connection.
- D. Provide balancing dampers on duct take-off to diffusers and grilles and registers, unless dampers are specified as part of diffuser, or grille and register assembly.
- E. Paint ductwork visible behind air outlets and inlets matte black, see Section 09 9123.

3.02 PROTECTION

- A. Protect installed products until completion of project.
- B. Replace, repair, or touch-up damaged products before Substantial Completion.

END OF SECTION 23 3700

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**SECTION 23 8200
CONVECTION HEATING AND COOLING UNITS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Electric cabinet unit heaters.

1.02 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide typical catalog of information including arrangements.

1.03 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS**2.01 ELECTRIC CABINET UNIT HEATERS**

- A. Provide products listed, classified, and labeled by Underwriters Laboratories Inc. (UL), Intertek (ETL), or testing firm acceptable to authority having jurisdiction as suitable for purpose indicated.
- B. Heating Elements: Provide open-wire, finned tubular, or resistance wire enclosed in steel sheath.
- C. Cabinet:
 - 1. Minimum 18 gauge, 0.0478 inch thick steel front panel with exposed corners and edges rounded, easily removed panels, glass fiber insulation and integral air outlet, and inlet grilles.
 - 2. Provide required hardware accessories for ceiling or recessed mounting.
- D. Finish:
 - 1. Factory applied, painted finish.
 - 2. Color: Factory standard color.
- E. Fan: Factory balanced, direct drive, axial type with fan guard connected to totally enclosed, thermally protected motor with permanently lubricated bearings, and thermal cutout switch with automatic reset to de-energize electric heating elements in the event of overheating.
- F. Controls:
 - 1. Remote wall-mounted thermostat.

PART 3 EXECUTION**3.01 EXAMINATION**

- A. Verify that surfaces are suitable for installation.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.
- B. Install equipment exposed to finished areas after walls and ceilings are finished and painted.
- C. Do not damage equipment or finishes.
- D. Cabinet Unit Heaters:
 - 1. Install as indicated.
 - 2. Coordinate to ensure correct recess size for recessed units.

3.03 CLEANING

- A. After construction and painting is completed, clean exposed surfaces of units.
- B. Touch-up marred or scratched surfaces of factory-finished cabinets using finish materials furnished by the manufacturer.

3.04 PROTECTION

- A. Provide finished cabinet units with protective covers during the balance of construction.

END OF SECTION 23 8200

SECTION 26 0519
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Single conductor building wire.
- B. Metal-clad cable.
- C. Wiring connectors.
- D. Electrical tape.
- E. Cable ties.

1.02 RELATED REQUIREMENTS

- A. Section 07 8400 - Firestopping.
- B. Section 26 0505 - Selective Demolition for Electrical: Disconnection, removal, and/or extension of existing electrical conductors and cables.
- C. Section 26 0526 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.
- D. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

- A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2013.
- B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2011.
- C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes; 2010 (Reapproved 2014).
- D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2014).
- E. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape; 2010.
- F. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.
- G. NECA 104 - Recommended Practice for Installing Aluminum Building Wire and Cable; 2012.
- H. NECA 120 - Standard for Installing Armored Cable (AC) and Metal-Clad Cable (MC); 2012.
- I. NECA 121 - Standard for Installing Nonmetallic-Sheathed Cable (Type NM-B) and Underground Feeder and Branch-Circuit Cable (Type UF); 2007.
- J. NEMA WC 70 - Nonshielded Power Cable 2000 V or Less for the Distribution of Electrical Energy; 2009.
- K. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- L. UL 44 - Thermoset-Insulated Wires and Cables; Current Edition, Including All Revisions.
- M. UL 83 - Thermoplastic-Insulated Wires and Cables; Current Edition, Including All Revisions.
- N. UL 486A-486B - Wire Connectors; Current Edition, Including All Revisions.
- O. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.
- P. UL 486D - Sealed Wire Connector Systems; Current Edition, Including All Revisions.
- Q. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape; Current Edition, Including All Revisions.
- R. UL 1569 - Metal-Clad Cables; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
 - 2. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.

1.05 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.

1.07 FIELD CONDITIONS

- A. Do not install or otherwise handle thermoplastic-insulated conductors at temperatures lower than 14 degrees F, unless otherwise permitted by manufacturer's instructions. When installation below this temperature is unavoidable, notify Architect and obtain direction before proceeding with work.

PART 2 PRODUCTS

2.01 CONDUCTOR AND CABLE APPLICATIONS

- A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.
- B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.
- C. Metal-clad cable is permitted only as follows:
 - 1. Where not otherwise restricted, may be used:
 - a. Where concealed above accessible ceilings for final connections from junction boxes to luminaires.
 - 1) Maximum Length: 6 feet.
 - b. Where concealed in hollow stud walls, above accessible ceilings, and under raised floors for branch circuits up to 20 A.

2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

- A. Provide products that comply with requirements of NFPA 70.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.
- D. Comply with NEMA WC 70.
- E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.
- F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.
- G. Conductor Material:
 - 1. Provide copper conductors except where aluminum conductors are specifically indicated or permitted for substitution. Conductor sizes indicated are based on copper unless specifically indicated as aluminum. Conductors designated with the abbreviation "AL" indicate aluminum.
 - 2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
 - 3. Tinned Copper Conductors: Comply with ASTM B33.

H. Conductor Color Coding:

1. Color Coding Method: Integrally colored insulation.
2. Color Code:
 - a. 480Y/277 V, 3 Phase, 4 Wire System:
 - 1) Phase A: Brown.
 - 2) Phase B: Orange.
 - 3) Phase C: Yellow.
 - 4) Neutral/Grounded: Gray.
 - b. 208Y/120 V, 3 Phase, 4 Wire System:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - 4) Neutral/Grounded: White.
 - c. Equipment Ground, All Systems: Green.

2.03 SINGLE CONDUCTOR BUILDING WIRE

- A. Description: Single conductor insulated wire.
- B. Conductor Stranding:
 1. Feeders and Branch Circuits:
 - a. Size 10 AWG and Smaller: Solid.
 - b. Size 8 AWG and Larger: Stranded.
- C. Insulation Voltage Rating: 600 V.
- D. Insulation:
 1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.
 2. Aluminum Building Wire (only where specifically indicated or permitted for substitution): Type XHHW-2.

2.04 METAL-CLAD CABLE

- A. Description: NFPA 70, Type MC cable listed and labeled as complying with UL 1569, and listed for use in classified firestop systems to be used.
- B. Conductor Stranding:
 1. Size 10 AWG and Smaller: Solid.
 2. Size 8 AWG and Larger: Stranded.
- C. Insulation Voltage Rating: 600 V.
- D. Insulation: Type THHN, THHN/THWN, or THHN/THWN-2.
- E. Grounding: Full-size integral equipment grounding conductor.
- F. Armor: Steel, interlocked tape.

2.05 WIRING CONNECTORS

- A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.
- B. Wiring Connectors for Splices and Taps:
 1. Copper Conductors Size 8 AWG and Smaller: Use twist-on insulated spring connectors.
 2. Copper Conductors Size 6 AWG and Larger: Use mechanical connectors or compression connectors.
 3. Connectors for Aluminum Conductors: Use compression connectors.
- C. Wiring Connectors for Terminations:
 1. Aluminum Conductors: Use compression connectors for all connections.
- D. Do not use insulation-piercing or insulation-displacement connectors designed for use with conductors without stripping insulation.

- E. Do not use push-in wire connectors as a substitute for twist-on insulated spring connectors.
- F. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F for standard applications and 302 degrees F for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.
- G. Mechanical Connectors: Provide bolted type or set-screw type.
- H. Compression Connectors: Provide circumferential type or hex type crimp configuration.

2.06 ACCESSORIES

- A. Electrical Tape:
 - 1. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F and suitable for continuous temperature environment up to 221 degrees F.
- B. Cable Ties: Material and tensile strength rating suitable for application.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that interior of building has been protected from weather.
- B. Verify that work likely to damage wire and cable has been completed.
- C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.
- D. Verify that field measurements are as indicated.
- E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

- A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

3.03 INSTALLATION

- A. Circuiting Requirements:
 - 1. Unless dimensioned, circuit routing indicated is diagrammatic.
 - 2. Arrange circuiting to minimize splices.
- B. Install products in accordance with manufacturer's instructions.
- C. Perform work in accordance with NECA 1 (general workmanship).
- D. Install aluminum conductors in accordance with NECA 104.
- E. Install underground feeder and branch-circuit cable (Type UF-B) in accordance with NECA 121.
- F. Install metal-clad cable (Type MC) in accordance with NECA 120.
- G. Installation in Raceway:
 - 1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
 - 2. Pull all conductors and cables together into raceway at same time.
 - 3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
 - 4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.
- H. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.
- I. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent

support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.

1. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conductors and cables to lay on ceiling tiles.
- J. Terminate cables using suitable fittings.
- K. Install conductors with a minimum of 12 inches of slack at each outlet.
- L. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.
- M. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.
- N. Make wiring connections using specified wiring connectors.
1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
 2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
 3. Do not remove conductor strands to facilitate insertion into connector.
 4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.
 5. Connections for Aluminum Conductors: Fill connectors with oxide inhibiting compound where not pre-filled by manufacturer.
 6. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
 7. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
- O. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.
- P. Insulate ends of spare conductors using vinyl insulating electrical tape.
- Q. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.
- R. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

END OF SECTION 26 0519

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SECTION 26 0526
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Conductors for grounding and bonding.
- B. Connectors for grounding and bonding.

1.02 RELATED REQUIREMENTS

- A. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.
- B. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.
- B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.05 QUALITY ASSURANCE**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS**2.01 GROUNDING AND BONDING REQUIREMENTS**

- A. Existing Work: Where existing grounding and bonding system components are indicated to be reused, they may be reused only where they are free from corrosion, integrity and continuity are verified, and where acceptable to the authority having jurisdiction.
- B. Do not use products for applications other than as permitted by NFPA 70 and product listing.
- C. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.
- D. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.02 GROUNDING AND BONDING COMPONENTS

- A. General Requirements:
 - 1. Provide products listed, classified, and labeled as suitable for the purpose intended.
 - 2. Provide products listed and labeled as complying with UL 467 where applicable.
- B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 26 0526:
 - 1. Use insulated copper conductors unless otherwise indicated.
 - a. Exceptions:
 - 1) Use bare copper conductors where installed underground in direct contact with earth.
 - 2) Use bare copper conductors where directly encased in concrete (not in raceway).
- C. Connectors for Grounding and Bonding:

1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.

2.03 CONNECTORS AND ACCESSORIES

- A. Mechanical Connectors: Bronze.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that work likely to damage grounding and bonding system components has been completed.
- B. Verify that field measurements are as indicated.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Make grounding and bonding connections using specified connectors.
 1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
 2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
 3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.
 4. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
 5. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
- D. Identify grounding and bonding system components in accordance with Section 26 0553.

END OF SECTION 26 0526

**SECTION 26 0529
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Support and attachment requirements and components for equipment, conduit, cable, boxes, and other electrical work.

1.02 REFERENCE STANDARDS

- A. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
- B. Sequencing:

1.04 QUALITY ASSURANCE

- A. Comply with NFPA 70.
- B. Comply with applicable building code.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS**2.01 SUPPORT AND ATTACHMENT COMPONENTS**

- A. General Requirements:
 - 1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of electrical work.
 - 2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
 - 3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported with a minimum safety factor of 1.5. Include consideration for vibration, equipment operation, and shock loads where applicable.
 - 4. Do not use products for applications other than as permitted by NFPA 70 and product listing.
- B. Conduit and Cable Supports: Straps, clamps, etc. suitable for the conduit or cable to be supported.
 - 1. Conduit Straps: One-hole or two-hole type; steel or malleable iron.
 - 2. Conduit Clamps: Bolted type unless otherwise indicated.
- C. Outlet Box Supports: Hangers, brackets, etc. suitable for the boxes to be supported.
- D. Metal Channel (Strut) Framing Systems: Factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
- E. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.
- F. Anchors and Fasteners:
 - 1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.
 - 2. Concrete: Use preset concrete inserts, expansion anchors, or screw anchors.
 - 3. Solid or Grout-Filled Masonry: Use expansion anchors or screw anchors.
 - 4. Hollow Masonry: Use toggle bolts.
 - 5. Hollow Stud Walls: Use toggle bolts.
 - 6. Steel: Use beam clamps, machine bolts, or welded threaded studs.

2.02 MATERIALS

- A. Hangers, Supports, Anchors, and Fasteners - General: Corrosion-resistant materials of size and type adequate to carry the loads of equipment and conduit, including weight of wire in conduit.
- B. Supports: Fabricated of structural steel or formed steel members; galvanized.
- C. Anchors and Fasteners:

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive support and attachment components.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
- C. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
- D. Equipment Support and Attachment:
 - 1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
 - 2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
 - 3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
 - 4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.
- E. Conduit Support and Attachment: Also comply with Section 26 0533.13.
- F. Box Support and Attachment: Also comply with Section 26 0533.16.

3.03 FIELD QUALITY CONTROL

- A. Install hangers and supports as required to adequately and securely support electrical system components, in a neat and workmanlike manner, as specified in NECA 1.
 - 1. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
- B. Rigidly weld support members or use hexagon-head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.
- C. Install surface-mounted cabinets and panelboards with minimum of four anchors.
- D. In wet and damp locations use steel channel supports to stand cabinets and panelboards 1 inch off wall.
- E. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.

END OF SECTION 26 0529

**SECTION 26 0533.13
CONDUIT FOR ELECTRICAL SYSTEMS**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Electrical metallic tubing (EMT).
- B. Rigid polyvinyl chloride (PVC) conduit.

1.02 RELATED REQUIREMENTS**1.03 REFERENCE STANDARDS**

- A. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing; 2015.
- B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
- B. Sequencing:

PART 2 PRODUCTS**2.01 CONDUIT APPLICATIONS**

- A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.
- B. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, comply with the most restrictive requirements. Where conduit type for a particular application is not specified, use galvanized steel rigid metal conduit.
- C. Concealed Within Hollow Stud Walls: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or electrical metallic tubing (EMT).
- D. Concealed Above Accessible Ceilings: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or electrical metallic tubing (EMT).
- E. Connections to Luminaires Above Accessible Ceilings: Use flexible metal conduit.
 - 1. Maximum Length: 6 feet.
- F. Connections to Vibrating Equipment:
 - 1. Dry Locations: Use flexible metal conduit.
 - 2. Damp, Wet, or Corrosive Locations: Use liquidtight flexible metal conduit.

2.02 CONDUIT REQUIREMENTS

- A. Existing Work: Where existing conduits are indicated to be reused, they may be reused only where they comply with specified requirements, are free from corrosion, and integrity is verified by pulling a mandrel through them.

2.03 ELECTRICAL METALLIC TUBING (EMT)

- A. Description: NFPA 70, Type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.

2.04 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT

- A. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; rated for use with conductors rated 90 degrees C.

- B. Fittings:
 - 1. Manufacturer: Same as manufacturer of conduit to be connected.
 - 2. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

2.05 ACCESSORIES

- A. Solvent Cement for PVC Conduit and Fittings: As recommended by manufacturer of conduit and fittings to be installed.
- B. Pull Strings: Use nylon cord with average breaking strength of not less than 200 pound-force.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive conduits.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Conduit Routing:
 - 1. Unless dimensioned, conduit routing indicated is diagrammatic.
 - 2. When conduit destination is indicated without specific routing, determine exact routing required.
 - 3. Conceal all conduits unless specifically indicated to be exposed.
 - 4. Conduits in the following areas may be exposed, unless otherwise indicated:
 - a. Electrical rooms.
 - b. Mechanical equipment rooms.
- C. Conduit Support:
 - 1. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
 - 2. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.
 - 3. Use conduit strap to support single surface-mounted conduit.
 - 4. Use metal channel (strut) with accessory conduit clamps to support multiple parallel surface-mounted conduits.
 - 5. Use conduit clamp to support single conduit from beam clamp or threaded rod.
 - 6. Use trapeze hangers assembled from threaded rods and metal channel (strut) with accessory conduit clamps to support multiple parallel suspended conduits.
- D. Connections and Terminations:
 - 1. Use suitable adapters where required to transition from one type of conduit to another.
- E. Penetrations:
 - 1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
 - 2. Make penetrations perpendicular to surfaces unless otherwise indicated.
 - 3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
 - 4. Conceal bends for conduit risers emerging above ground.
 - 5. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
- F. Unless specifically indicated on plan drawings or approved by architect do not use exposed conduit in finished areas. Exposed conduit in unfinished areas is an acceptable means of installation.

3.03 FIELD QUALITY CONTROL

- A. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.

3.04 CLEANING

- A. Clean interior of conduits to remove moisture and foreign matter.

3.05 PROTECTION

- A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

END OF SECTION 26 0533.13

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SECTION 26 0533.16
BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL**1.01 RELATED REQUIREMENTS**

- A. Section 08 3100 - Access Doors and Panels: Panels for maintaining access to concealed boxes.
- B. Section 26 0526 - Grounding and Bonding for Electrical Systems.
- C. Section 26 0529 - Hangers and Supports for Electrical Systems.
- D. Section 26 0533.13 - Conduit for Electrical Systems:
 - 1. Conduit bodies and other fittings.
- E. Section 26 2726 - Wiring Devices:
 - 1. Wall plates.

1.02 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2010.
- B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2010.
- C. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2012.
- D. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; 2013 (Reaffirmed 2020).
- E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- F. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
 - 2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
 - 3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.
 - 4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.
 - 5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others.
 - 6. Coordinate the work with other trades to preserve insulation integrity.
 - 7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS**2.01 BOXES**

- A. General Requirements:
 - 1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
 - 2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.

3. Provide products listed, classified, and labeled as suitable for the purpose intended.
 4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
 5. Provide grounding terminals within boxes where equipment grounding conductors terminate.
- B. Outlet and Device Boxes Up to 100 cubic inches, Including Those Used as Junction and Pull Boxes:
1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
 2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
 3. Use suitable concrete type boxes where flush-mounted in concrete.
 4. Use suitable masonry type boxes where flush-mounted in masonry walls.
 5. Use raised covers suitable for the type of wall construction and device configuration where required.
 6. Use shallow boxes where required by the type of wall construction.
 7. Do not use "through-wall" boxes designed for access from both sides of wall.
 8. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
 9. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
 10. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.
 11. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes unless specifically indicated or permitted.
 12. Wall Plates: Comply with Section 26 2726.
- C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches:
1. Junction and Pull Boxes Larger Than 100 cubic inches:
 - a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive boxes.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Box Locations:
 1. Locate boxes to be accessible. Provide access panels in accordance with Section 08 3100 as required where approved by the Architect.
 2. Unless dimensioned, box locations indicated are approximate.
- E. Box Supports:
 1. Secure and support boxes in accordance with NFPA 70 and Section 26 0529 using suitable supports and methods approved by the authority having jurisdiction.
 2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in

accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.

3. Installation Above Suspended Ceilings: Do not provide support from ceiling grid or ceiling support system.
- F. Install boxes plumb and level.
- G. Flush-Mounted Boxes:
1. Install boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4 inch or does not project beyond finished surface.
 2. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface.
 3. Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8 inch at the edge of the box.
- H. Install boxes as required to preserve insulation integrity.
- I. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
- J. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.
- K. Close unused box openings.
- L. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.
- M. Provide grounding and bonding in accordance with Section 26 0526.

3.03 CLEANING

- A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.

3.04 PROTECTION

- A. Immediately after installation, protect boxes from entry of moisture and foreign material until ready for installation of conductors.

END OF SECTION 26 0533.16

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**SECTION 26 0553
IDENTIFICATION FOR ELECTRICAL SYSTEMS**

PART 2 PRODUCTS**1.01 IDENTIFICATION REQUIREMENTS**

- A. Identification for Equipment:
 - 1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.
 - 2. Service Equipment:
 - a. Use identification nameplate to identify each service disconnecting means.
 - 3. Available Fault Current Documentation: Use identification label to identify the available fault current and date calculations were performed at locations requiring documentation by NFPA 70 including but not limited to the following.
 - a. Service equipment.
 - b. Industrial control panels.
 - c. Motor control centers.
 - d. Elevator control panels.
 - e. Industrial machinery.
- B. Identification for Conductors and Cables:
 - 1. Color Coding for Power Conductors 600 V and Less: Comply with Section 26 0519.
 - 2. Identification for Communications Conductors and Cables: Comply with Section 27 1000.
 - 3. Use identification nameplate or identification label to identify color code for ungrounded and grounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment when premises has feeders or branch circuits served by more than one nominal voltage system.
- C. Identification for Raceways:
 - 1. Use voltage markers to identify highest voltage present for accessible conduits at maximum intervals of 20 feet.
- D. Identification for Boxes:
 - 1. Use voltage markers to identify highest voltage present.
- E. Identification for Devices:

1.02 IDENTIFICATION NAMEPLATES AND LABELS

- A. Identification Nameplates:
 - 1. Materials:
 - a. Indoor Clean, Dry Locations: Use plastic nameplates.
 - b. Outdoor Locations: Use plastic, stainless steel, or aluminum nameplates suitable for exterior use.
 - 2. Plastic Nameplates: Two-layer or three-layer laminated acrylic or electrically non-conductive phenolic with beveled edges; minimum thickness of 1/16 inch; engraved text.
 - a. Exception: Provide minimum thickness of 1/8 inch when any dimension is greater than 4 inches.
 - 3. Stainless Steel Nameplates: Minimum thickness of 1/32 inch; engraved or laser-etched text.
 - 4. Aluminum Nameplates: Anodized; minimum thickness of 1/32 inch; engraved or laser-etched text.
 - 5. Mounting Holes for Mechanical Fasteners: Two, centered on sides for sizes up to 1 inch high; Four, located at corners for larger sizes.
- B. Identification Labels:
 - 1. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
 - a. Use only for indoor locations.

2. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.
- C. Format for General Information and Operating Instructions:
 1. Minimum Size: 1 inch by 2.5 inches.
 2. Legend: Include information or instructions indicated or as required for proper and safe operation and maintenance.
 3. Text: All capitalized unless otherwise indicated.
 4. Minimum Text Height: 1/4 inch.
 5. Color: Black text on white background unless otherwise indicated.
- D. Format for Caution and Warning Messages:
 1. Minimum Size: 2 inches by 4 inches.
 2. Legend: Include information or instructions indicated or as required for proper and safe operation and maintenance.
 3. Text: All capitalized unless otherwise indicated.
 4. Minimum Text Height: 1/2 inch.
 5. Color: Black text on yellow background unless otherwise indicated.

1.03 WIRE AND CABLE MARKERS

- A. Markers for Conductors and Cables: Use wrap-around self-adhesive vinyl cloth, wrap-around self-adhesive vinyl self-laminating, heat-shrink sleeve, plastic sleeve, plastic clip-on, or vinyl split sleeve type markers suitable for the conductor or cable to be identified.
- B. Markers for Conductor and Cable Bundles: Use plastic marker tags secured by nylon cable ties.
- C. Legend: Power source and circuit number or other designation indicated.
- D. Text: Use factory pre-printed or machine-printed text, all capitalized unless otherwise indicated.
- E. Minimum Text Height: 1/8 inch.
- F. Color: Black text on white background unless otherwise indicated.

1.04 VOLTAGE MARKERS

- A. Markers for Conduits: Use factory pre-printed self-adhesive vinyl, self-adhesive vinyl cloth, or vinyl snap-around type markers.
- B. Markers for Boxes and Equipment Enclosures: Use factory pre-printed self-adhesive vinyl or self-adhesive vinyl cloth type markers.
- C. Minimum Size:
 1. Markers for Conduits: As recommended by manufacturer for conduit size to be identified.
 2. Markers for Pull Boxes: 1 1/8 by 4 1/2 inches.
 3. Markers for Junction Boxes: 1/2 by 2 1/4 inches.
- D. Legend:
 1. Markers for Voltage Identification: Highest voltage present.
- E. Color: Black text on orange background unless otherwise indicated.

1.05 WARNING SIGNS AND LABELS

- A. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.
- B. Warning Signs:
 1. Materials:
 2. Minimum Size: 7 by 10 inches unless otherwise indicated.
- C. Warning Labels:
 1. Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using materials recognized to UL 969.

2. Machine-Printed Labels: Use thermal transfer process printing machines and accessories recommended by label manufacturer.
3. Minimum Size: 2 by 4 inches unless otherwise indicated.

PART 3 EXECUTION

2.01 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:
 1. Surface-Mounted Equipment: Enclosure front.
 2. Flush-Mounted Equipment: Inside of equipment door.
 3. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
 4. Elevated Equipment: Legible from the floor or working platform.
 5. Interior Components: Legible from the point of access.
 6. Conduits: Legible from the floor.
 7. Boxes: Outside face of cover.
 8. Conductors and Cables: Legible from the point of access.
 9. Devices: Outside face of cover.
- C. Install identification products centered, level, and parallel with lines of item being identified.
- D. Secure nameplates to exterior surfaces of enclosures using stainless steel screws and to interior surfaces using self-adhesive backing or epoxy cement.
- E. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.

END OF SECTION 26 0553

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**SECTION 26 0583
WIRING CONNECTIONS**

PART 2 PRODUCTS

1.01 MATERIALS

- A. Wire and Cable: As specified in Section 26 0519.
- B. Boxes: As specified in Section 26 0533.16.

PART 3 EXECUTION

2.01 ELECTRICAL CONNECTIONS

- A. Make electrical connections in accordance with equipment manufacturer's instructions.
- B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.
- C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.
- D. Provide receptacle outlet to accommodate connection with attachment plug.
- E. Provide cord and cap where field-supplied attachment plug is required.
- F. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.
- G. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.
- H. Install terminal block jumpers to complete equipment wiring requirements.
- I. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

END OF SECTION 26 0583

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**SECTION 26 2726
WIRING DEVICES****PART 2 PRODUCTS****1.01 MANUFACTURERS**

- A. Substitutions: See Section 01 6000 - Product Requirements.

1.02 WIRING DEVICE APPLICATIONS

- A. Provide wiring devices suitable for intended use and with ratings adequate for load served.
- B. Provide weather resistant GFCI receptacles with specified weatherproof covers for receptacles installed outdoors or in damp or wet locations.
- C. Provide GFCI protection for receptacles installed within 6 feet of sinks.
- D. Provide GFCI protection for receptacles installed in kitchens.
- E. Provide isolated ground receptacles for receptacles serving computers and electronic cash registers.

1.03 WIRING DEVICE FINISHES

- A. Wiring Devices, Unless Otherwise Indicated: MATCH EXISTING with MATCH EXISTING wall plate.

1.04 WALL SWITCHES

- A. Wall Switches - General Requirements: AC only, quiet operating, general-use snap switches with silver alloy contacts, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 20 and where applicable FS W-S-896; types as indicated on the drawings.
 - 1. Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with separate ground terminal screw.
- B. Standard Wall Switches: Industrial specification grade, 20 A, 120/277 V with standard toggle type switch actuator and maintained contacts; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.

1.05 RECEPTACLES

- A. Receptacles - General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498 and where applicable FS W-C-596; types as indicated on the drawings.
 - 1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.
- B. GFCI Receptacles:
 - 1. GFCI Receptacles - General Requirements: Self-testing, with feed-through protection and light to indicate ground fault tripped condition and loss of protection; listed as complying with UL 943, class A.
 - a. Provide test and reset buttons of same color as device.
 - 2. Standard GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style.
 - 3. Weather Resistant GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations.

1.06 WALL PLATES

- A. Wall Plates: Comply with UL 514D.
 - 1. Configuration: One piece cover as required for quantity and types of corresponding wiring devices.
 - 2. Size: Standard; _____.
 - 3. Screws: Metal with slotted heads finished to match wall plate finish.

- B. Weatherproof Covers for Damp Locations: Gasketed, cast aluminum, with self-closing hinged cover and corrosion-resistant screws; listed as suitable for use in wet locations with cover closed.
- C. Weatherproof Covers for Wet Locations: Gasketed, cast aluminum, with hinged lockable cover and corrosion-resistant screws; listed as suitable for use in wet locations while in use with attachment plugs connected and identified as extra-duty type.

PART 3 EXECUTION

2.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.
- C. Verify that wall openings are neatly cut and will be completely covered by wall plates.
- D. Verify that final surface finishes are complete, including painting.
- E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
- F. Verify that conditions are satisfactory for installation prior to starting work.

2.02 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

2.03 INSTALLATION

- A. Perform work in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
- B. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of wiring devices provided under this section.
- C. Install wiring devices in accordance with manufacturer's instructions.
- D. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
- E. Where required, connect wiring devices using pigtails not less than 6 inches long. Do not connect more than one conductor to wiring device terminals.
- F. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.
- G. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
- H. Provide GFCI receptacles with integral GFCI protection at each location indicated. Do not use feed-through wiring to protect downstream devices.
- I. Install wiring devices plumb and level with mounting yoke held rigidly in place.
- J. Install wall switches with OFF position down.
- K. Install vertically mounted receptacles with grounding pole on top and horizontally mounted receptacles with grounding pole on left.
- L. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.
- M. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.

2.04 ADJUSTING

- A. Adjust devices and wall plates to be flush and level.

2.05 CLEANING

- A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

END OF SECTION 26 2726

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**SECTION 26 5100
INTERIOR LIGHTING**

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Exit signs.
- B. Ballasts and drivers.

1.02 RELATED REQUIREMENTS

- A. Section 26 0529 - Hangers and Supports for Electrical Systems.
- B. Section 26 0533.16 - Boxes for Electrical Systems.

1.03 REFERENCE STANDARDS

- A. IES LM-79 - Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products; 2008.
- B. IES LM-80 - Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays, and Modules; Illuminating Engineering Society; 2015.
- C. NECA/IESNA 500 - Standard for Installing Indoor Commercial Lighting Systems; 2006.
- D. NECA/IESNA 502 - Standard for Installing Industrial Lighting Systems; 2006.
- E. NEMA LE 4 - Recessed Luminaires, Ceiling Compatibility; 2012.
- F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. UL 924 - Emergency Lighting and Power Equipment; Current Edition, Including All Revisions.
- I. UL 1598 - Luminaires; Current Edition, Including All Revisions.
- J. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the installation of luminaires with mounting surfaces installed under other sections or by others. Coordinate the work with placement of supports, anchors, etc. required for mounting. Coordinate compatibility of luminaires and associated trims with mounting surfaces at installed locations.
 - 2. Coordinate the placement of luminaires with structural members, ductwork, piping, equipment, diffusers, fire suppression system components, and other potential conflicts installed under other sections or by others.
 - 3. Coordinate the placement of exit signs with furniture, equipment, signage or other potential obstructions to visibility installed under other sections or by others.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked with all proposed features.
- C. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.06 QUALITY ASSURANCE

1.07 DELIVERY, STORAGE, AND PROTECTION

- A. Receive, handle, and store products according to NECA/IESNA 500 (commercial lighting), NECA/IESNA 502 (industrial lighting), and manufacturer's written instructions.
- B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.

1.08 FIELD CONDITIONS

- A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.09 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 LUMINAIRE TYPES

- A. Furnish products as indicated in luminaire schedule included on the drawings.

2.02 LUMINAIRES

- A. Provide products that comply with requirements of NFPA 70.
- B. Provide products that are listed and labeled as complying with UL 1598, where applicable.
- C. Provide products listed, classified, and labeled as suitable for the purpose intended.
- D. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.
- E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.
- F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.
- G. Recessed Luminaires:
 - 1. Ceiling Compatibility: Comply with NEMA LE 4.
- H. LED Luminaires:
 - 1. Components: UL 8750 recognized or listed as applicable.
 - 2. Tested in accordance with IES LM-79 and IES LM-80.
 - 3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.

2.03 EMERGENCY LIGHTING UNITS

- A. Description: Emergency lighting units complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.
- B. Operation: Upon interruption of normal power source or brownout condition exceeding 20 percent voltage drop from nominal, solid-state control automatically switches connected lamps to integral battery power for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.
- C. Battery:
 - 1. Size battery to supply all connected lamps, including emergency remote heads where indicated.
- D. Diagnostics: Provide power status indicator light and accessible integral test switch to manually activate emergency operation.
- E. Provide low-voltage disconnect to prevent battery damage from deep discharge.

2.04 EXIT SIGNS

- A. Description: Exit signs and similar signs for special purpose applications such as area of refuge/rescue assistance.
- B. Powered Photoluminescent Exit Signs: Illuminated with photoluminescent-pigmented material for emergency illumination, activated by ambient light and auxiliary integral LED illumination, and requiring no batteries to operate.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.
- C. Verify that suitable support frames are installed where required.
- D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.
- E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION

- A. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of luminaires provided under this section.
- B. Install products in accordance with manufacturer's instructions.
- C. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 500 (commercial lighting) and NECA 502 (industrial lighting).
- D. Provide required support and attachment in accordance with Section 26 0529.
- E. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.
- F. Suspended Ceiling Mounted Luminaires:
 - 1. Do not use ceiling tiles to bear weight of luminaires.
 - 2. Do not use ceiling support system to bear weight of luminaires unless ceiling support system is certified as suitable to do so.
 - 3. Secure lay-in luminaires to ceiling support channels using listed safety clips at four corners.
 - 4. See appropriate Division 9 section where suspended grid ceiling is specified for additional requirements.
- G. Recessed Luminaires:
 - 1. Install trims tight to mounting surface with no visible light leakage.
- H. Suspended Luminaires:
 - 1. Install using the suspension method indicated, with support lengths and accessories as required for specified mounting height.
- I. Install accessories furnished with each luminaire.
- J. Bond products and metal accessories to branch circuit equipment grounding conductor.
- K. Emergency Lighting Units:
- L. Exit Signs:
- M. Install lamps in each luminaire.

3.04 ADJUSTING

- A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect. Secure locking fittings in place.
- B. Aim and position adjustable emergency lighting unit lamps to achieve optimum illumination of egress path as required or as directed by Architect or authority having jurisdiction.
- C. Exit Signs with Field-Selectable Directional Arrows: Set as indicated or as required to properly designate egress path as directed by Architect or authority having jurisdiction.

3.05 CLEANING

- A. Clean surfaces according to NECA 500 (commercial lighting), NECA 502 (industrial lighting), and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

3.06 CLOSEOUT ACTIVITIES

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

3.07 PROTECTION

- A. Protect installed luminaires from subsequent construction operations.

END OF SECTION 26 5100