

PROJECT MANUAL – VOL I DESIGN DEVELOPMENT

LITTLE ROCK EYE CLINIC - WEST

LITTLE ROCK, ARKANSAS

May 5, 2026



Architect
WER Architects

Civil Consultants
Joe White & Associates, Inc.

Structural Consultants
Live Oak Engineering

Mechanical/Electrical/Plumbing/Fire Protection
Insight Engineering

WER
ARCHITECTS

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**SECTION 00 0105
CERTIFICATIONS PAGE**

ARCHITECT

**I HEREBY CERTIFY THAT THIS PROJECT MANUAL WAS PREPARED BY ME, OR UNDER MY
DIRECT SUPERVISION, AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF
THE STATE OF ARKANSAS.**

NAME: JOHN GREER, A.I.A. DATE: XX/XX/2026 REG. NO C-44

END OF SECTION

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**SECTION 00 3100
AVAILABLE PROJECT INFORMATION**

PART 1 GENERAL V.22

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. Site and Utility Survey: Entitled ALTA/ NSPS LAND TITLE AND SURVEY, dated 5/13/2025.
 - 1. Original copy is bound into the project drawings.
 - 2. This survey identifies grade elevations prepared primarily for the use of Architect in establishing new grades and identifying natural water shed.
- C. Geotechnical Report: TBD.

1.02 PRELIMINARY DATA

- A. Certain preliminary investigations and studies made by the Owner are available to the bidders but will not be part of Contract Documents, as follows:
- B. Preliminary Project Schedule: Construction time 10 months, August 6, 2026 through June 1, 2026.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

3.01 OBTAINMENT OF PERMITS

- A. Contractor to obtain the following required permits, at no cost to Owner:
 - 1. Building Permit for all trades.
- B. Building Permit Procedures: When required to obtain this permit:
 - 1. Complete and file permit application(s) with appropriate agency.
 - a. Submit application within five days of the Notice to Proceed.
 - 2. Pay required fees.
 - 3. Advise Architect if submission of modified documents is necessary to have the authorities having jurisdiction complete the plan review and approval process. Submit modified documents expeditiously.
 - 4. Do not commence execution of any item of work for which a permit has not been obtained.

END OF SECTION

**SECTION 00 5200
AGREEMENT FORM**

PART 1 GENERAL V.22

1.01 FORM OF AGREEMENT

1.02 THE AIA A101 - 2017 STANDARD AGREEMENT WILL BE USED AS THE BASIS OF THE FORM OF AGREEMENT FOR THIS PROJECT. COPIES OF THIS STANDARD DOCUMENT ARE AVAILABLE AT SOUTHERN REPROGRAPHICS OR WER ARCHITECTS IF DESIRED OR NEEDED PRIOR TO BID DATE.

1.03 RELATED REQUIREMENTS

- A. Section 00 7200 - General Conditions.
- B. Section 00 7300 - Supplementary General Conditions.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

**SECTION 00 6000
PERFORMANCE AND PAYMENT BOND**

V.22

We _____, hereinafter referred to as Principal and _____, hereinafter referred to as Surety, are held and firmly bound unto Little Rock Eye Clinic, as obligee, hereinafter referred to as Owner, in the amount of \$ _____, said amount to be deemed a performance bond payable to Owner under the terms of this Performance and Payment Bond Agreement. The Principal and Surety state that the Surety is a solvent corporate surety company authorized to do business in the State of Arkansas.

1.01

- A. Principal has by written agreement dated _____ entered into a Contract (the Contract) with the Owner for:
- B. _____

_____. The above referenced Contract is incorporated herein by reference.
- C. Under this Performance and Payment Bond Agreement, the Principal and Surety shall be responsible for the following:
 - a. The principal shall faithfully perform the above reference contract, which is incorporated herein by reference and shall pay all indebtedness for labor and materials furnished or performed under the contract.
 - b. In the event that the principal fails to perform the contract, the principal and the surety, jointly and severally, shall indemnify and save harmless the owner from all cost and damage which the owner may suffer by reason of principal's failure to perform the contract. Said indemnification shall include, but not be limited to, full reimbursement and repayment to the owner for all outlays and expenses which the owner may incur in making good any such default or failure to perform the contract by the principal.
 - c. Principal shall pay all persons all indebtedness for labor or material furnished or performed under the contract and in doing so this obligation shall be null and void. In the event that principal fails to pay for such indebtedness, such persons shall have a direct right of action against the principal and surety, jointly and severally, under this obligation, subject to the owner's priority.
- D. This bond given in accordance with Arkansas laws and regulations (including Ark. Code Ann. §18-44-503, §19-4-1405 and § 22-9-401 et seq.). The Surety guarantees that the Principal shall comply with Ark. Code Ann. § 22-9-308 (d) by payment and full compliance with all prevailing hourly wage contract provisions where the contract amount exceeds the amount provided in Ark. Code Ann. § 22-9-302(1).
- E. Any alteration which may be made in the terms of the Contract, or in the work to be done under it, or the giving by the Owner of any extension of time for the performance of the contract, or any other forbearance on the part of either the Owner or the Principal to the other shall not in any way release the Principal and the Surety or Sureties or either or any of them, their heirs, personal representatives, successors or assigns from their liability hereunder, notice to the Suety or Sureties of any such alteration, extension or forbearance being hereby waived. In no event shall the aggregate liability of the Surety exceed the amount provided in the Contract.
- F. This Performance and Payment Bond Agreement is binding upon the above named parties, and their successors, heirs, assigns and personal representatives.

- G. Executed by the parties who individually represent that each has the authority to enter into this agreement.
- H. BY: _____
- I. _____
- J. CONTRACTOR DATE
- K. BY: _____
- L. _____
- M. AGENT/ATTORNEY-IN-FACT DATE
- N. (IN ACCORDANCE WITH ARK. CODE ANN. §22-9-402(B))
- O. _____
- P. AGENT DATE
- Q. _____
- R. ADDRESS
- S. _____
- T. CITY COUNTY STATE ZIP CODE
- U. _____
- V. BUSINESS PHONE: _____
- W. FAX: _____
- X. MAIL: _____

1.02

1.03 THIS FORM IS THE ONLY PERFORMANCE AND PAYMENT BOND ACCEPTABLE TO THE OWNER

1.04 PERFORMANCE AND PAYMENT BOND

1.05 AMENDMENT #___

- A. We, _____ hereinafter referred to as Principal, and _____ hereinafter referred to as Surety, have entered into an agreement entitled "Performance and Payment Bond", with the Little Rock Eye Clinic as obligee hereinafter after known as Owner Agency. Futhermore, we agree that said bond agreement, which was filed in the county of _____ on the _____ day of _____, 20__ and this amendment #___ is hereby incorporated into said bond agreement and any previous amendments(s) therein. This amendment shall be upon the same terms and conditions as set forth in the Bond Agreement, including any amendments, except the Agreement shall be amended and modified as follows:
- B. 2. This Performance and Payment Bond Agreement Amendment is binding upon the above named parties, and their successors, heirs, assigns and personal representatives. The Bond Agreement as hereby extended, amended and modified is hereby ratified and confirmed by the parties who individually represent that each has the authority to enter into this amended agreement.

1.06

- A. BY: _____
- B. CONTRACTOR DATE
- C. BY: _____
- D. ARKANSAS RESIDENT LOCAL AGENT/ATTORNEY-IN-FACT DATE
- E. (in accordance with Arkansas Code Annotated §22-9-402(b)(1)(2))
- F. _____
- G. AGENT DATE
- H. ADDRESS BUSINESS PHONE/FAX #
- I. _____
- J. CITY COUNTY STATE ZIP CODE

1.07

1.08 ARKANSAS STATUTORY PERFORMANCE AND PAYMENT BOND AMENDMENT IS THE ONLY BOND AMENDMENT FORM THE OWNER WILL ACCEPT.

- A.

END OF PERFORMANCE AND PAYMENT BOND

**SECTION 00 6200
CONSENT OF SURETY**

Comes the undersigned, who does hereby swear and affirm that:

My name is _____ and I am an authorized representative of
_____ a surety company.

With regards to the Project ; Contract date for LREYEC26.00; Contractor; and Little Rock Eye Clinic, Owner; I hereby approve the final payment to the contractor. I agree that the final payment to the contractor shall not relieve the Surety Company of any of its obligations as set forth in the contract with the Little Rock Eye CI and this contractor.

AFFIANT

DATE

VERIFICATION

STATE OF ARKANSAS)

COUNTY OF _____)

SUBSCRIBED AND SWORN TO before me this _____ of _____, 20.

NOTARY PUBLIC

MY COMMISSION EXPIRES:

END OF SECTION

**SECTION 00 6300
RELEASE OF CLAIMS**

Comes the undersigned, who does hereby swear and affirm that:

My name is _____, and my (printed or typed)
address is _____

doing business as, _____.

Pursuant to Contract Number , LREYEC26.00, Little Rock Eye Clinic, Rahling Road, Little Rock, AR; Pacel #53L0361301101, Contract Date: TBD.

excepted as listed below in Paragraph 4, I have paid otherwise satisfied all obligations for all materials and equipment furnished, for all work, labor, and services performed, and for all known claims against the Contractor arising in any manner in connection with the performance of the contract referenced above for which the Owner or his property might in any way be held responsible.

To the best of my knowledge, information and belief, excepted as listed below in Paragraph 4, the Releases or Waivers of Claim, attached hereto and incorporated herein, include the Contract, all subcontractors, all suppliers of materials and equipment, and all performers of work, labor or services who have or may have claims against any property of the Owner arising in any manner out of the performance of the Contract referenced above.

The Exceptions are: (if none, indicate "none." If required by the Owner, the Contractor shall furnish bond satisfactory to the Owner for each exception.)

AFFIANT

DATE

VERIFICATION

STATE OF ARKANSAS)

COUNTY OF _____)

SUBSCRIBED AND SWORN TO before me this _____ of _____, 20.

NOTARY PUBLIC

MY COMMISSION EXPIRES:

END OF SECTION

**SECTION 00 6325
SUBSTITUTION REQUEST FORM**

LREYEC26.00

Little Rock Eye Clinic West

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**SUBSTITUTION REQUEST FORM
DESIGN DEVELOPMENT**

05/05/2026

V.22 SEND TO:

WER ARCHITECTS / PLANNERS ATTN: JAMES SWANN, JSWANN@WERARCH.COM

901 W. 3RD STREET

LITTLE ROCK, AR 72201

PHONE: 501-374-5300 FAX: 501-374-5247

SECTION: _____ PARAGRAPH: _____ SPECIFIED ITEM: _____

PROPOSED SUBSTITUTE: _____

ATTACH, COMPLETE DESCRIPTION, DESIGNATION, CATALOG OR MODEL NUMBER, SPEC DATA SHEET, AND OTHER TECHNICAL DATA, INCLUDING LABORATORY TESTS IF APPLICABLE.

ANSWER THE FOLLOWING QUESTIONS:

WILL SUBSTITUTION AFFECT DIMENSIONS INDICATED ON DRAWINGS? IS THE SIZE DIFFERENT PHYSICAL SIZE?

WILL SUBSTITUTION AFFECT WIRING, PIPING, DUCTWORK, ETC. INDICATED ON DRAWINGS? THIS INCLUDES LOWER OR HIGHER ELECTRICAL LOAD AND/OR VOLTAGE; DIFFERENT BTU HEAT LOAD AND/OR OR VENTING; REQUIRED CLEARANCES, ETC.

WHAT AFFECT WILL SUBSTITUTION HAVE ON OTHER TRADES?

LIST ANY DIFFERENCES BETWEEN PROPOSED SUBSTITUTION AND SPECIFIED ITEM:

IF NECESSARY, WILL THE UNDERSIGNED PAY FOR ARCHITECTS/ENGINEER'S COSTS, REQUIRED TO REVISE WORKING DRAWINGS, THAT ARE CAUSED BY SUBSTITUTION?

MANUFACTURER'S WARRANTY OF PROPOSED ITEMS ARE SAME DIFFERENT

PROPOSED COST SAVINGS USING SUBSTITUTION PRODUCT: _____

REVIEW COMMENTS:

APPROVED

APPROVED AS NOTED (SEE ATTACHED EXPLANATION)

NOT APPROVED / REJECTED

REJECTED / RECEIVED TOO LATE / NOT REVIEWED

REMARKS: _____ REVIEWED BY: _____

SUBMITTED BY:

FIRM: _____

ADDRESS: _____

SIGNATURE: _____

DATE: _____

PHONE/EMAIL: _____

END OF SECTION

**SECTION 00 7200
GENERAL CONDITIONS**

V.22 FORM OF GENERAL CONDITIONS

**1.01 THE AIA A201-2007 GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION
APPLICABLE TO THIS CONTRACT IS ATTACHED FOLLOWING THIS PAGE.**

RELATED REQUIREMENTS

2.01 SECTION 00 7300 - SUPPLEMENTARY GENERAL CONDITIONS.

END OF SECTION

**SECTION 00 7300
SUPPLEMENTARY GENERAL CONDITIONS**

PART 1 GENERAL V.22

1.01 SUMMARY

- A. The terms used in these Supplementary Conditions that are defined in the General Conditions have the meanings assigned to them in the General Conditions.

1.02 MODIFICATIONS TO GENERAL CONDITIONS

SUPPLEMENTARY GENERAL CONDITIONS: THE FOLLOWING SUPPLEMENTS MODIFY THE "GENERAL CONDITION OF THE CONTRACT FOR CONSTRUCTION", AIA DOCUMENT A201-2017. WHERE A PORTION OF THE GENERAL CONDITIONS IS MODIFIED OR DELETED BY THESE SUPPLEMENTARY CONDITIONS, THE UNALTERED PORTIONS OF THE GENERAL CONDITIONS SHALL REMAIN IN EFFECT.

3.8.1 In line 1 after "Documents." add "Refer to Section 01 2100."

3.8.2.2 Add the following to end of clause, "except when installation is specified as part of the allowance. "Refer to Section 01 2100."

3.9.3 Add the following sentence at the end of the paragraph, "In event the approved superintendent must be changed for circumstances beyond the G.C.'s control, or at the direction of the Owner, the replacement superintendent must meet with the Owner's approval.

3.10 Add the following new subparagraph:

"3.10.4 Submit construction schedules in accordance with Section 01 3216."

3.11 At end of paragraph, add "Submit in accordance with Section 01 7000."

3.12.5 At end of subparagraph, add "Submit in accordance with Section 01 3000."

7.3.7 Lines 4 through 5, delete "reasonable...profit." and insert "an allowance for overhead and profit in accordance with the schedule set forth in subparagraph 7.3.11.

7.3 Add new subparagraph as follows:

"7.3.11 In subparagraph 7.3.7, the allowance for overhead and profit included in the total cost to the Owner shall be based on the following schedule:

1. For the contractor, for work performed by the Contractor's own forces, 12 percent of the cost.
2. For the contractor, for work performed by his subcontractor, 5 percent of the amount due the subcontractor.
3. For each subcontractor or sub-subcontractor involved, for work performed by that subcontractor's or sub-subcontractor's own forces, 12 percent of the cost.
4. For each subcontractor, for work performed by the subcontractor's sub-subcontractors, 5% of the amount due the sub-subcontractor.
5. Cost to which overhead and profit is to be applied shall be determined in accordance with Subparagraph 7.3.7.
6. In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials and subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major costs items are subcontracts, they shall be itemized also."

8.3 Add the following subparagraphs:

"8.3.4 The construction completion dates agreed on include an allowance for calendar days per month which may not be available for construction out-of-doors (normal inclement weather).

8.3.4.1 Contract time will not be extended due to normal inclement weather unless the Contractor can substantiate, to satisfaction of Architect, that greater-than-normal inclement weather occurred, considering the full term of contract time, using averaged accumulated record

mean values from climatological data compiled by National Weather Service for the project locale, and that alleged greater-than-normal inclement weather actually delayed Work or portions of Work.

8.3.4.1.1 The measure of extreme weather shall be the number of days in excess of those stated for each month, in which precipitation exceeded 0.10 inch, from area weather station for same period of time, which is same source of data used to determine normal weather losses.

8.3.4.1.2 If total accumulated number of calendar days lost to weather exceeds total accumulated number expected for same period from inclement weather table, time for completion will be extended by number of calendar days needed to include excess number of calendar days lost.

8.3.4.2 Contract time will not be extended due to weather occurring after building is enclosed. "Enclosed" is defined to mean when building is sufficiently sealed, either temporarily or permanently, to permit structure to be heated and roof completed in order to permit drywall trades to work. The Architect shall determine when structure is "enclosed", and shall issue a letter to Owner, with a copy to Contractor, stating date building became "enclosed".

8.3.4.3 No change in contract sum will be authorized because of contract time due to weather."

9.2 At end of paragraph, add "Submit in accordance with Section 01 3000."

9.3.1:

1. At end of subparagraph, add "Submit in accordance with Section 01 3000."

2. Add new clause as follows:

"9.3.1.3 Until Substantial Completion of the Work, 5% of each progress payment will be retained. Refer to Article 9.8.3 for adjustment in retainage upon Substantial Completion of Work.

9.10.2 At end of subparagraph, add "Submit affidavit of payment of debts and claims and affidavit of release of liens on AIA Forms G706 and G706A, respectively."

11.1.1 Add the following new clauses:

"11.1.1.9 Liability Insurance shall include all major divisions of coverage and be on a comprehensive basis including:

1. Premises Operations (including X, C and U coverages as applicable).
2. Independent Contractor's Protective.
3. Products and Completed Operations.
4. Personal Injury Liability with Employment Exclusion deleted.
5. Contractual, including specified provision for Contractor's obligation under Paragraph 3.18.
6. Owner, non-owned and hired motor vehicles.
7. Broad Form Property Damage including Completed Operations."

11.1.2 Add new clause as follows:

"11.1.2.1 The insurance required by Subparagraph 11.1.1 shall be written for not less than the following limits, or greater if required by law:

1. Worker's Compensation Statutory
Employer's Liability \$100,000 per accident,
-\$500,000 Disease Policy Limit
-\$100,000 Disease, Each Employee
2. Commercial General Liability
(including Premises-Operations,
Independent Contractors'
Protective, Products and Completed
Operations, Broad Form Property Damage)
 - a. Bodily Injury & \$1,000,000 each occurrence
Property Damage Combined \$2,000,000 aggregate

- b. Products and Completed Operations to be maintained for 2 year after final Payment. \$2,000,000 aggregate
- c. Property Damage Liability Insurance will provide X, C, or U Coverage.
- d. Broad Form Property Damage Coverage shall include Completed Operations.
- 3. Contractual Liability
 - a. Bodily Injury & Property Damage Combined \$1,000,000 each occurrence \$2,000,000 aggregate
- 4. Personal Injury, with Employment Exclusion deleted \$2,000,000 aggregate
- 5. Business Auto Liability (including owned, non-owned and hired vehicles)
 - a. Bodily Injury & Property Damage Combined \$1,000,000 each occurrence \$2,000,000 aggregate
- 6. If the General Liability coverages are provided by a Commercial Liability policy, the:
 - a. General Aggregate shall be not less than \$2,000,000 and it shall apply, in total, to this Project only.
 - b. Fire Damage Limit shall be not less than \$50,000 on any one Fire.
 - c. Medical Expense Limit shall be not less than \$2,500 on any one person.
- 7. Umbrella Excess Liability \$1,000,000 over primary insurance
 -
 - \$10,000 retention for self-insured -hazards, each occurrence

11.1.3 Add the following new clause as follows:

"11.1.3.1 The Contractor shall furnish 3 copies of each Certificate of Insurance herein required which shall specifically set forth evidence of all coverage required. Use ACORD certificate, 25-S, completed and supplemented in accordance with AIA Document A715."

11.2.1 In line 1 change "Owner" to "Contractor" and insert the following:

"The Contractor shall purchase and maintain insurance, in same amounts as specified in 11.1.2.1 above, covering the Owner's contingent liability for claims which may arise from operations under the Contract. The term "Owner", shall be deemed to include the Owner's employees, the Architect, and the Architect's employees and consultants."

11.3.1 ADD the following sentences:

"The form of policy for this coverage shall be Completed Value. If the Owner is damaged by the failure of the Contractor to maintain such insurance, then the Contractor shall bear all reasonable costs properly attributable thereto."

11.3.1.3 Delete in its entirety.

11.3.4 Delete in its entirety.

11.4.1 Delete in its entirety and substitute the following:

"11.4.1 Contractor shall bond covering faithful performance of the Contract and payment of obligations arising thereunder. Bonds must be issued by a Surety licensed to do work in Arkansas. Cost shall be included in the Contract Sum. The amount of bond shall be equal to 100 percent of the Contract Sum.

11.4.1.1 The Contractor shall deliver the required bonds to the Owner not less than three days following the date the Agreement is entered into, or if the work is to be commenced prior thereto in response to a letter of intent, the Contractor shall, prior to the commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished."

11.4.1.2 The Contractor shall require the attorney-in-fact who executes the required bond on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

11.4.1.3 File a copy of the bond with Circuit Clerk in the county in which project is located.

12.2.2 Add the following to the subparagraph:

"12.2.2.1 Provide for and arrange a one year inspection of facilities before warranties expire, by Contractor, Architect/Engineer, and Owner. Inspection to occur before the end of the eleventh month from the date of substantial completion"

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

**SECTION 01 1000
SUMMARY**

PART 1 GENERAL V.22

1.01 PROJECT

- A. Project Name: Little Rock Eye Clinic West
- B. Owner's Name: Rahling Chenal, LLC
- C. Architect's Name: WER Architects.
- D. The Project consists of the construction of a new single-story medical office building of approximately 17,050 square feet with approximately 11,000 square feet to be finished out and 6,050 square feet of shell space. The constructed space will be a eye clinic with lanes, optical shop, offices and tech stations.

1.02 WORK BY OWNER

- A. The Owner, without sacrificing their right to do so, does not plan to undertake significant work with their own forces within the construction site prior to Substantial Completion. Refer to the responsibility matrix following this section for components being performed by Owner.
- B. Items noted NIC (Not in Contract) will be supplied and installed by Owner before Substantial Completion. Some items include:
- C. Owner will supply and install the following:
- D. Owner will supply the following for installation by Contractor:
- E. Items and equipment noted to be Contractor Furnished and Contractor Installed is to be purchased new by the Contractor and all cost associated with the handling, installation and connection should be included turn-key in the project. All items and equipment noted to be Contractor Installed shall be coordinated with provider and the Contractor shall include all costs for handling, installation and connection in the project.
- F. Cooperate fully with the Owner's own forces or separate contractors, if any, so work on those contracts may be carried out smoothly, without interfering with or delaying work under this contract.

1.03 OWNER OCCUPANCY

- A. Owner intends to occupy the Project upon Substantial Completion.
- B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- C. Schedule the Work to accommodate Owner occupancy.

1.04 CONTRACTOR USE OF SITE AND PREMISES

- A. Construction Operations: Limited to areas noted on Drawings.
 - 1. Locate and conduct construction activities in ways that will limit disturbance to site.
- B. Arrange use of site and premises to allow:
 - 1. Owner occupancy.
 - 2. Work by Others.
 - 3. Work by Owner.
- C. Do not unreasonably encumber site with materials or equipment. Confine stockpiling of materials to areas authorized by Owner.
- D. Provide access to and from site as required by law and by Owner:
 - 1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
 - 2. Do not obstruct roadways, sidewalks, or other public ways without permit.

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

END OF SECTION

**SECTION 01 2000
PRICE AND PAYMENT PROCEDURES**

PART 1 GENERAL V.22

1.01 SECTION INCLUDES

- A. Procedures for preparation and submittal of applications for progress payments.
- B. Documentation of changes in Contract Sum and Contract Time.
- C. Change procedures.
- D. Correlation of Contractor submittals based on changes.
- E. Procedures for preparation and submittal of application for final payment.

1.02 SCHEDULE OF VALUES

- A. Use Schedule of Values Form: AIA G-702 Application and Certificate for Payment.
- B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.
- C. Forms filled out by hand will not be accepted.
- D. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.
- E. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification section. Identify site mobilization.
- F. Include in each line item, the amount of Allowances specified in this section. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.
- G. Revise schedule to list approved Change Orders, with each Application For Payment.

1.03 APPLICATIONS FOR PROGRESS PAYMENTS

- A. Payment Period: Submit at intervals stipulated in the Agreement.
- B. Use Form AIA G702 and Form AIA G703, edition stipulated in the Agreement.
- C. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
- D. Forms filled out by hand will not be accepted.
- E. 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.
- F. Execute certification by signature of authorized officer.
- G. 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.
- H. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.
- I. Submit one electronic and three hard-copies of each Application for Payment.

1.04 MODIFICATION PROCEDURES

- A. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue instructions directly to Contractor.
- B. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
 - 1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
 - 2. Promptly execute the change.
- C. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 15 days.
- D. 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.
- E. Substantiation of Costs: Provide full information required for evaluation.
 - 1. 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.
- F. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
- G. 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 Price.
- H. 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.
- I. Promptly enter changes in Project Record Documents.

1.05 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.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

**SECTION 01 2100
ALLOWANCES**

PART 1 GENERAL V.22

1.01 SECTION INCLUDES

- A. Cash allowances.
- B. Payment and modification procedures relating to allowances.

1.02 CASH ALLOWANCES

- A. Costs Included in Cash Allowances: Cost of product to Contractor or subcontractor, less applicable trade discounts.
- B. Costs Not Included in Cash Allowances: Product delivery to site and handling at the site, including unloading, uncrating, and storage; protection of products from elements and from damage; product mark-up; cost of installation materials; and labor for installation and finishing. All the aforementioned costs shall be included in the base bid for the project, unless noted otherwise in the Allowances Schedule below..
- C. Architect Responsibilities:
 - 1. Consult with Contractor for consideration and selection of products, suppliers , and installers.
 - 2. Select products in consultation with Owner and transmit decision to Contractor.
 - 3. Prepare Change Order.
- D. Contractor Responsibilities:
 - 1. Assist Architect in selection of products, suppliers , and installers.
 - 2. Obtain proposals from suppliers and installers and offer recommendations.
 - 3. On notification of which products have been selected, execute purchase agreement with designated supplier and installer.
 - 4. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
 - 5. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.
- E. Differences in costs will be adjusted by Change Order.

1.03 ALLOWANCES SCHEDULE

- A. **Allowance #1:** Provide Owner Contingency of \$XX,XXX for use at owner's discretion.
NOTE: ALLOWANCES 2-5 below are in addition to the quantities defined by the construction documents. Refer to Geo-technical Report, Civil, and Landscape Drawings.
- B. **Allowance #2:** Section 31 2000 & 31 2316 - Excavation Undercut: Include the stipulated quantity of 250 cubic yards for actual quantity adjustment. Provide unit pricing (per cubic yard) for actual quantity adjustment. Refer to Section 01 2200 - Unit Prices for schedule.
- C. **Allowance #3:** Section 31 2000 - Mass Rock Excavation: Include the stipulated quantity of 100 cubic yards for Mass Rock Excavation in the Project. Provide unit pricing (per cubic yard) for actual quantity adjustment. Refer to Section 01 2200 - Unit Prices for schedule.
- D. **Allowance #4:** Section 31 2316 - Trench Rock Excavation: Include the stipulated quantity of 250 cubic yards for Trench Rock Excavation in the Project. Provide unit pricing (per cubic yard) for actual quantity adjustment. Refer to Section 01 2200 - Unit Prices for schedule.
- E. **Allowance #5:** Section 32 9213 - Hydromulching: Include the stipulated quantity of 500 square yards for repair of lawn areas by hydroseeding. Provide unit pricing (per square yard) for actual quantity adjustment. Refer to Section 01 2200 - Unit Prices for schedule.

**FINAL
ALLOWANCES
PENDING**

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

**SECTION 01 2200
UNIT PRICES**

PART 1 GENERAL V.22

1.01 SECTION INCLUDES

- A. List of unit prices, for use in preparing Bids.
- B. Measurement and payment criteria applicable to Work performed under a unit price payment method.

1.02 COSTS INCLUDED

- A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

1.03 UNIT QUANTITIES SPECIFIED

- A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

1.04 MEASUREMENT OF QUANTITIES

- A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.
- B. Take all measurements and compute quantities. Measurements and quantities will be verified by Architect.
- C. Assist by providing necessary equipment, workers, and survey personnel as required.
- D. Measurement Devices:
 - 1. Weigh Scales: Inspected, tested and certified by the applicable state Weights and Measures department within the past year.
 - 2. Platform Scales: Of sufficient size and capacity to accommodate the conveying vehicle.
 - 3. Metering Devices: Inspected, tested and certified by the applicable state department within the past year.
- E. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.
- F. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.
- G. Measurement by Area: Measured by square dimension using mean length and width or radius.
- H. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord.
- I. Stipulated Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed item or unit of the Work.
- J. Perform surveys required to determine quantities, including control surveys to establish measurement reference lines. Notify Architect prior to starting work.
- K. Contractor's Engineer Responsibilities: Sign surveyor's field notes or keep duplicate field notes , calculate and certify quantities for payment purposes.

1.05 PAYMENT

- A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit price.
- B. Payment will not be made for any of the following:
 - 1. Products wasted or disposed of in a manner that is not acceptable.

2. Products determined as unacceptable before or after placement.
3. Products not completely unloaded from the transporting vehicle.
4. Products placed beyond the lines and levels of the required Work.
5. Products remaining on hand after completion of the Work.
6. Loading, hauling, and disposing of rejected Products.
7. Products placed and concealed prior to assessment of quantity or volume.

1.06 SCHEDULE OF UNIT PRICES

- A. **Unit Price #1:** Excavation; Section Section 32 9213. Provide unit pricing (per cubic yard) for Unexcavated Material in the Project.
- B. **Unit Price #2:** Rock Removal; Section Section 32 9213. Provide unit pricing (per cubic yard) for Rock Removal in the Project.
- C. **Unit Price #3:** Trenching; Section Section 32 9213. Provide unit pricing (per cubic yard) for Trenching in the Project.
- D. **Unit Price #4:** Hydromulching; Section Section 32 9213. Provide unit pricing (per square yard) for Hydromulching in the Project.

**FINAL UNIT
PRICES
PENDING**

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

**SECTION 01 2300
ALTERNATES**

PART 1 GENERAL V.22

1.01 SECTION INCLUDES

- A. Description of Deductive Alternates.
- B. Procedures for pricing Deductive Alternates.
- C. Documentation of changes to Contract Price and Contract Time.

1.02 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.
- B. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

1.03 SCHEDULE OF DEDUCTIVE ALTERNATES

- A. Deductive Alternate No.1:
- B. Deductive Alternate No.2:
- C. Deductive Alternate No.3:
- D. Deductive Alternate No.4:
- E. Deductive Alternate No.5:
- F. Deductive Alternate No.6:
- G. ***Deductive Alternate No.7:***

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

**SECTION 01 2500
SUBSTITUTION PROCEDURES**

PART 1 GENERAL V.22

1.01 SECTION INCLUDES

- A. Procedural requirements for proposed substitutions.

1.02 DEFINITIONS

- A. General Clarification: Where a definite material is specified it is not the intent to discriminate against any equal product from another manufacturer. It is the intent to set a definite standard. Open competition is expected, but in all cases, complete data must be submitted for comparison and test when requested by Architect. No substitution shall be made unless authorized in writing by the Architect. If the Contractor proposes to substitute an equal product, he shall make this fact known, in writing, to the Architect as soon as possible after the award of the contract.
- B. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
 - a. Unavailability.
 - b. Regulatory changes.
 2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.
 - a. Substitution requests offering advantages solely to the Contractor will not be considered.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 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 including aesthetics of physical properties such as available colors, patterns and textures.
 2. Agrees to provide the same warranty for the substitution as for the specified product.
 3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
 4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
 5. Waives claims for additional costs or time extension that may subsequently become apparent.
 6. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.
- B. A Substitution Request for specified installer constitutes a representation that the submitter:
1. Has acted in good faith to obtain services of specified installer, but was unable to come to commercial, or other terms.
- C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
1. Note explicitly any non-compliant characteristics.
- D. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
1. Forms included in the Project Manual are adequate for this purpose, and must be used.

- E. Limit each request to a single proposed substitution item.
 - 1. Submit an electronic document, combining the request form with supporting data into single document.

3.02 SUBSTITUTION PROCEDURES DURING PROCUREMENT

- A. Instructions to Bidders specifies time restrictions for submitting requests for substitutions during the bidding period, and the documents required.
- B. Submittal Form (before award of contract):
 - 1. Submit substitution requests by completing the form in Section 006325; see this section for additional information and instructions. Use only this form; other forms of submission are unacceptable.
 - 2. Lighting Fixture Substitution- Lighting Fixtures not specifically listed in the Lighting Fixture Schedule by manufacturer indicated as approved to bid must be submitted 7 days prior to bid. Provide cut sheets labeled with the mark shown in the Lighting Fixture Schedule on E0.02. Provide lighting level calculations for review. Typical lighting levels for classrooms are acceptable. Architect will review for conformance with the Design Intent. Engineer will review for conformance with technical requirements.
 - 3. Plumbing Fixture Substitution- Plumbing Fixtures not specifically listed in the Plumbing Fixture Schedule by manufacturers indicated as approved to bid must be submitted 7 days prior to bid. Provide cut sheets labeled with the mark shown in the Plumbing Fixture Schedule.
 - 4. Mechanical Equipment Substitution- Mechanical Equipment not specifically listed in the Mechanical Equipment Schedules and specifically noted in the drawings by manufacturers indicated as approved to bid must be submitted 7 days prior to bid. Provide cut sheets labeled with the mark shown in the Mechanical Equipment Schedules. Architect will review for conformance with the Design Intent. Engineer will review for conformance with technical requirements.

3.03 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

- A. Submittal Form (after award of contract):
 - 1. Submit substitution requests by completing the form in Section 00 6325; see this section for additional information and instructions. Use only this form; other forms of submission are unacceptable.
- B. Architect will consider requests for substitutions only within 30 days after date of Agreement.
- C. Substitutions will not be considered under one or more of the following circumstances:
 - 1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
 - 2. Without a separate written request.
 - 3. When acceptance will require revisions to Contract Documents.

3.04 RESOLUTION

- A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.
- B. Architect will notify Contractor in writing of decision to accept or reject request.
 - 1. Architect's decision following review of proposed substitution will be noted on the submitted form.

3.05 ACCEPTANCE

- A. Accepted substitutions change the work of the Project. They will be recorded into submittal and any required changes to the Construction Documents will be incorporated into the work by issuance of Change Order, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

3.06 CLOSEOUT ACTIVITIES

- A. See Section 01 7800 - CLOSEOUT SUBMITTALS, for closeout submittals.

- B. Include completed Substitution Request Forms as part of the Project record. Include both approved and rejected Requests.

END OF SECTION

**SECTION 01 3000
ADMINISTRATIVE REQUIREMENTS**

PART 1 GENERAL V.22

1.01 SECTION INCLUDES

- A. Electronic document submittals.
- B. Preconstruction meeting.
- C. Site mobilization meeting.
- D. Progress meetings.
- E. Construction progress schedule.
- F. Change Order requirements.
- G. Contractor Liability requirements.
- H. Coordination drawings.
- I. Submittals for review, information, and project closeout.
- J. Number of copies of submittals.
- K. Submittal procedures.

1.02 PROJECT COORDINATION

- A. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for construction & delivery access, traffic, and parking facilities.
- B. During construction, coordinate use of site and facilities through the Project Coordinator.
- C. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- D. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities.
- E. Coordinate field engineering and layout work under instructions of the Project Coordinator.
- F. Make the following types of submittals to Architect:
 - 1. Requests for interpretation.
 - 2. Requests for substitution.
 - 3. Shop drawings, product data, and samples.
 - 4. Test and inspection reports.
 - 5. Manufacturer's instructions and field reports.
 - 6. Applications for payment and change order requests.
 - 7. Progress schedules.
 - 8. Coordination drawings.
 - 9. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTALS

- A. Any documents transmitted for purposes of administration of the contract will be in electronic (PDF) format and transmitted via an Internet-based e-mail service.
 - 1. In addition to submittals for review, information, and closeout, this procedure will apply to requests for information (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, proposal requests, change orders), applications for payment, field reports and meeting minutes, and any other document the Contractor or Architect wish to make part of the project electronic record.

2. Contractor and Architect will use conventional e-mail for this service, subject to the limitations of the service provider (file size).
 3. It is the Contractor's responsibility to submit documents in PDF format via file attachment to e-mail directed to WER Architects. Addressee will be determined at the pre-construction conference. Documents shall be reviewed and stamped by the contractor prior to submission. PDF documents without contractor's stamp, signature and/or initials, & date will not be reviewed. Each scan or PDF copy, especially large format documents or drawings, shall be individually stamped, if transmitted as individual files. Assembled documents in a single file need only be stamped once.
 4. Subcontractors, suppliers, and Architect's consultants are required to use the e-mail transmission of review documents, and provide copies directed to the Architect and Contractor.
 5. Users of the electronic document submission process shall provide an email address and Internet access. 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), is encouraged, unless scan to PDF file capability is provided by the document generator / provider.
 6. Paper documents & transmittals of electronic submissions will not be reviewed; emailed PDF documents without transmittal letters / forms from the contractor will not be reviewed.
 7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to physical samples or color selection charts.
- B. Cost: The cost of the electronic document submittal(s) is to be paid by Contractor; include the cost of the submittals in the contract sum.
- C. Project Closeout: Architect will determine which project electronic document files shall be archived for the Owner. The contractor shall provide these documents electronically and physical components as part of the close out document submission.

3.02 PRECONSTRUCTION MEETING

- A. Architect will schedule a meeting after Notice of Award.
- B. Attendance Required:
1. Owner.
 2. Architect.
 3. Contractor.
- C. Agenda:
1. Distribution of Contract Documents.
 2. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
 3. Designation of personnel representing the parties to Contract, the Owner and Architect.
 4. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 5. Scheduling.
- D. Record minutes and distribute copies within two days after meeting to participants, with electronic copies to Architect, Owner, participants, and those affected by decisions made.

3.03 SITE MOBILIZATION MEETING

- A. Architect will schedule a meeting at the Project site prior to Contractor occupancy.
- B. Attendance Required:
1. Contractor.
 2. Owner.
 3. Architect.
 4. Contractor's Superintendent.
 5. Major Subcontractors.

- C. Agenda:
 1. Use of premises by Owner and Contractor.
 2. Owner's requirements .
 3. Construction facilities and controls provided by Owner.
 4. Temporary utilities provided by Owner.
 5. Security and housekeeping procedures.
 6. Schedules.
 7. Application for payment procedures.
 8. Procedures for testing.
 9. Procedures for maintaining record documents.
 10. Requirements for start-up of equipment.
 11. Inspection and acceptance of equipment put into service during construction period.
- D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work at maximum monthly intervals.
- B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, Architect, as appropriate to agenda topics for each meeting.
- 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 two days after meeting to participants, with electronic copies to Architect, Owner, participants, and those affected by decisions made.

3.05 CONSTRUCTION PROGRESS SCHEDULE - SEE SECTION 01 3216

- A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.
- B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- C. 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.
- D. Within 10 days after joint review, submit complete schedule.
- E. Submit updated schedule with each Application for Payment.

3.06 COORDINATION DRAWINGS

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

3.07 DIGITAL DOCUMENT FILES AND RELEASES

- A. BIM Models: Projects are created by Architect and Engineers using Building Information Modelling software and not all projects will have these files available for Contractor's use. The final model is a composite of multiple models that will require separate models from consultants. Contact Architect and Engineers for specific availability and cost.
- B. AutoCAD files: Do not exist for architectural plans. Architect has capability to generate AutoCAD files that resemble the sheets as seen in the Construction Documents as well as generate entire floor plans of the building. This service can be provided at a cost to the Contractor per sheet/floor plan desired. See end of section for Digital Release form.
- C. Portable Digital Format (PDF): PDF of issued drawings can be provided to Contractor at no cost. Contact Architect for availability.
- D. Other documents: Contractor will have to directly contact consultants for trade specific files, such as AutoCAD files for topographical layout, etc.

3.08 REQUESTS FOR CHANGE ORDERS

- A. In order to facilitate checking of quotations for extras or credits, all proposals, except for those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials and subcontracts. Labor and materials shall be itemized in manner prescribed above. Where major cost items are subcontracts, they shall be itemized also.

3.09 CONTRACTOR LIABILITY REQUIREMENTS

- A. The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect Engineer and the Architect Engineer's consultants as additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations. The Architect / Engineer, Engineer, and their respective Consultants are responsible for their own Professional Liability coverage.

3.10 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
 - 1. Product data.
 - 2. Shop drawings.
 - 3. Samples for selection.
 - 4. Samples for verification.
 - 5. Delegated Design Deferred submittals.
- B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
- C. Samples will be reviewed only for aesthetic, color, or finish selection.
- D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - CLOSEOUT SUBMITTALS.

3.11 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
 - 1. Design data.
 - 2. Certificates.
 - 3. Test reports.
 - 4. Inspection reports.
 - 5. Manufacturer's instructions.
 - 6. Manufacturer's field reports.
 - 7. Other types indicated.

- B. Submit for Architect's knowledge as contract administrator or for Owner. No action will be taken.

3.12 SUBMITTALS FOR PROJECT CLOSEOUT

- A. When the following are specified in individual sections, submit them at project closeout:
 - 1. Project record documents.
 - 2. Operation and maintenance data.
 - 3. Warranties.
 - 4. Bonds.
 - 5. Other types as indicated.
- B. Submit for Owner's benefit during and after project completion.

3.13 NUMBER OF COPIES OF SUBMITTALS

- A. 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.
- B. Documents for Information: Submit one electronic copy.
- C. Documents for Project Closeout: Make electronic reproductions of submittal files originally reviewed. Include electronic files of any submittals for information. All hard copies of Operational Manuals included with products and equipment should be collected and retained for close out documentation.
- D. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
 - 1. After review, produce duplicates required for jobsite use & verification.
 - 2. Retained samples will not be returned to Contractor unless specifically so stated. Digital documentation of approved samples will be provided.

3.14 SUBMITTAL PROCEDURES

- A. Transmit each submittal with approved form and Contractors transmittal form. Transmittal shall be numbered sequentially and revised submittals should include original number and a sequential alphabetic suffix. Transmittal shall include list of each specification section or sections that are included in the submittal contents. Send transmitted submittal as one complete PDF; multiple files will not be reviewed and will need to be reassembled by Contractor.
- B. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number.
- C. 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.
- D. Deliver physical submittals to Architect at business address. In some instances, larger physical samples can be coordinated to be delivered to the construction site, typically for use in a mock-up.
- E. Schedule submittals to expedite the Project, and coordinate submission of related items. Transmit higher priority submittals first and provide date for anticipated return of submittal.
- F. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor. When large quantities of submittals are transmitted in a short time frame, review time may take longer. Mark high priority submittals on transmittal to notify / assist in an expedited review.
- G. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work. Any proposed change or deviation from Contract Document plans or specifications must be clearly noted and easily identifiable on the submittal. Any change must be identified and specifically requesting approval of proposed deviation by Architect or Engineer of Record. Failure to follow this requirement results in submitted deviation bearing the complete responsibility of the contractor.

- H. Comments made in submittals by Architect or Engineer that change contract costs need to be submitted to Architect as a Potential Change Order for Claims for review and approval by Owner prior to the change to project scope. Failure to follow this requirement, whether a cost savings or cost increase, results in the submitted cost change bearing the complete responsibility of the providing contractor.
- I. Provide space for Contractor and Architect review stamps. Submittals must be reviewed and stamped by Contractor, unstamped submittals will not be reviewed and will be returned.
- J. Submittals to be as complete, comprehensive and accurate as possible. Include all components requested to be reviewed in Submittal section 1.03 of the specifications. Do not split up a single specification section into multiple submittals (ie product data, samples, shop drawings, etc.). Avoid grouping unrelated specifications sections together in a submittal.
- K. Each submittal will only be reviewed two times; once for original review and then a second time for a potential revised submittal. Any further additional reviews must include General Contractor's explanation for their inability to conform with requirements. Additional reviews beyond aforementioned may have costs associated to complete additional reviews.
- L. When revised for resubmission, identify all changes made since previous submission. Cloud all changes and revised details / notes. Address all comments and/or questions posed in previous submission; lack of addressing all previous review comments are grounds for rejections of submittal. Only submit new or revised items. For revised items, clearly cloud or identify changed components.
- M. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
- N. Submittals not requested will not be recognized or processed.

3.15 AUTOCAD RELEASE FORM

- A. At your request, Witsell Evans Rasco, P.A. (WER) will provide electronic files for your convenience and use in the preparation of a bid or shop drawings related to Project: _____ subject to the following terms and conditions.
- B. WER’s electronic files are compatible with AutoCad as a dwg. file. WER makes no representation as to the compatibility of these files with your hardware or your software beyond the specified release of the referenced specifications.
- C. Data contained on these electronic files is part of WER’s instruments of service and shall not be used by you or anyone else receiving this data through or from you for any purpose other than as a convenience in the preparation of bids or shop drawings for the referenced project. Any other use or reuse by you or by others, will be at your sole risk and without liability or legal exposure to WER. You agree to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against WER, its officers, directors, employees, agents or sub-consultants which may arise out of or in connection with your use of the electronic files.
- D. Furthermore, you shall, to the fullest extent permitted by law, indemnify and hold harmless WER from all claims, damages, losses and expenses, including attorney’s fees arising out of or resulting from your use of these electronic files.
- E. **These electronic files are not contract documents.** Differences may exist between these electronic files and corresponding hard copy contract documents due to addenda, change orders or other revisions. WER makes no presentation regarding the accuracy or completeness of the electronic files you receive. In the event that a conflict arises between the signed contract documents prepared by WER and electronic files, the signed contract documents shall govern. You are responsible for determining if any conflict exists. By your use of these electronic files, you are not relieved of your duty to fully comply with the contract documents, including and without limitations, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions and coordinate your work with that of other contractors for the project.
- F. Because of the potential that the information presented on the electronic files can be modified, unintentionally or otherwise, WER reserves the right to remove all indications of its ownership and/or involvement from each electronic display.
- G. WER will furnish you electronic files at a cost of **\$150.00** per building floor or sheet, for the following:
 - 1. _____
 - 2. _____
 - 3. _____
 A service fee of \$ (_____) shall be remitted to WER prior to delivery of the electronic files.
- H. Under no circumstances shall delivery of the electronic files for use by you be deemed a sale by WER and WER makes no warranties, either express or implied, of merchantability and fitness for any particular purpose. In no event shall WER be liable for any loss of profit or any consequential damages.

SIGNED:

 WITSELL EVANS, RASCO PA CONTRACTOR NAME / TITLE

DATE: _____

 ADDRESS / PHONE NUMBER

END OF SECTION

**SECTION 01 3216
CONSTRUCTION PROGRESS SCHEDULE**

PART 1 GENERAL V.22

1.01 SECTION INCLUDES

- A. Preliminary schedule.
- B. Construction progress schedule, bar chart type.

1.02 SUBMITTALS

- A. Within 10 days after date of Agreement, submit preliminary schedule.
- B. Within 10 days after joint review, submit complete schedule.

1.03 QUALITY ASSURANCE

- A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with one years minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.

1.04 SCHEDULE FORMAT

- A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.
- B. Diagram Sheet Size: Maximum 22 x 17 inches. Provide electronic file(s) in PDF format.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRELIMINARY SCHEDULE

- A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.02 CONTENT

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Identify each item by specification section number.
- C. Provide sub-schedules to define critical portions of the entire schedule.
- D. Include conferences and meetings in schedule.
- E. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
- F. Provide separate schedule of submittal dates for shop drawings, product data, and samples, owner-furnished products, products identified under Allowances, and dates reviewed submittals will be required from Architect. Indicate decision dates for selection of finishes.
- G. Indicate delivery dates for owner-furnished products.
- H. Provide legend for symbols and abbreviations used.

3.03 BAR CHARTS

- A. Include a separate bar for each major portion of Work or operation.
- B. Identify the first work day of each week.

3.04 REVIEW AND EVALUATION OF SCHEDULE

- A. Participate in joint review and evaluation of schedule with Architect at each submittal.
- B. Evaluate project status to determine work behind schedule and work ahead of schedule.
- C. After review, revise as necessary as result of review, and resubmit within 10 days.

3.05 UPDATING SCHEDULE

- A. Maintain schedules to record actual start and finish dates of completed activities. Revised schedules should show original baseline start and finish dates for activities in comparison with actual work started and completed.
- B. Indicate progress of each activity to date of revision, with projected completion date of each activity.
- C. Annotate diagrams to graphically depict current status of Work.
- D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
- E. Indicate changes required to maintain Date of Substantial Completion.
- F. Submit reports required to support recommended changes.
- G. Provide narrative report to define problem areas, anticipated delays, and impact on the schedule. Report corrective action taken or proposed and its effect.

3.06 DISTRIBUTION OF SCHEDULE

- A. Distribute copies of updated schedules to Contractor's project site file, to subcontractors, suppliers, Architect, Owner, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

END OF SECTION

**SECTION 01 3340
DELEGATED DESIGN DEFERRED SUBMITTAL**

PART 1 GENERAL V.22

1.01 SECTION INCLUDES

- A. Delegated design deferred submittals approval requirement including those specified in individual Specification Sections.
- B. Stamp and seal of delegated license professional when required by referenced Specification Sections.

1.02 DEFINITIONS

- A. Delegated Design:: _____
 - 1. Transfer of design responsibility to Contractor for one or more specialty scopes of the work for the construction of a project as indicated in Specifications.
 - 2. Delegated design requires Contractor to obtain professional engineering services for design when specified in individual Specification Sections.
- B. Deferred Approval Items:
 - 1. Deferred approval items are those portions of the design that are not submitted at the time of the application for permit, and that are to be submitted to Authority Having Jurisdiction within a specified period.
 - 2. Deferral of any submittal items shall have prior approval of the building official.
 - 3. Architect will review deferred submittal items prior to Contractor submitting to Authority Having Jurisdiction with a notation indicating that the deferred submittal documents have been reviewed and that they have been found to be in general conformance with the design of the building.
- C. Deferred Submittal Approval Process for Contractor:
 - 1. Includes preparing documents, shop drawings, certifications, meetings and procedures, including changes due to interpretations by Authority Having Jurisdiction, fees, inspections and testing procedures, and other items as may be required to provide installation and regulatory final approval for this deferred approval Work.
 - 2. Includes coordination of the deferred approval items, and scheduling sufficient time to complete the process including but not limited to review and approval by the Owner, Architect and their additional designated reviewers, installation by Contractor, inspection and testing by an approved agency, and final approval by Authority Having Jurisdiction.
- D. Qualified Professional Engineer: Registered to practice engineering in the State the project is located in for following disciplines:
 - 1. Structural.
 - 2. Mechanical.
 - 3. Fire Protection.
 - 4. Plumbing.
 - 5. Electrical.

1.03 DEFERRED SUBMITTAL REQUIREMENTS FOR DELEGATED DESIGN WORK

- A. Section includes deferred approval requirements for the following items:
 - 1. Structural metal stud framing.
 - 2. Stair systems.
 - 3. Ladders.
 - 4. Railing systems.
 - 5. Exterior wall cladding (stone).
 - 6. Acoustical reflectors.
 - 7. Glazing systems.
 - 8. Acoustically transparent wood and mesh assemblies.
 - 9. Fire sprinkler systems.

10. Smoke and fire alarm systems.
 11. Other items specified in individual sections such as audio visual equipment and FF&E equipment requiring structural supports and bracing.
- B. Deferred Submittal Approval Requirements: In connection with the delegated design systems as indicated on Drawings or specified, Contractor shall submit complete list of materials and other required details as required under Section 013300 - Submittals.
1. Detailed drawings, and certifications shall be prepared under the supervision of, and stamped / signed by a professional Structural Engineer registered in that discipline in the State the project is located in.
 - a. It shall be Contractor's responsibility, and Contractor's registered professionals, to present submittals, drawings, and certifications to Architect and to Authorities Having Jurisdiction as deferred submittal for approval.
 - b. All work shall be engineered according to and comply with performance or design requirements in Specifications and with Building Codes referenced on Drawings.
 - c. Architect's comments shall be incorporated in engineered drawings prior to submittal to Authorities Having Jurisdiction.
- C. Responsible Control:
1. All shop drawings and related submittals shall be responsibility of Contractor, stamped and signed approved by Contractor and Contractor's design professionals and submitted to Architect for review and acceptance.
 2. The Architect and appropriate Consultants will review deferred submittals and material data for consistency with design intent only. Contract Drawings indicate design intent and shall be used as providing minimum required for design, fabrication, function, support and anchorage. Architect's review does not relieve Contractor and Contractor's subcontractors and their design professionals of their responsibilities to meet Contract Document requirements.

1.04 PERFORMANCE REQUIREMENTS

- A. Responsibility for Review and Approval Process for Deferred Approval Items:
1. General Contractor is responsible for Authority Having Jurisdiction review and approval of deferred submittal items, including but not limited to engineering, approvals, fees and costs, testing and inspections, installation, review and approval including securing final approvals and turning documentation over to the Owner.
 2. Contractor shall review Contract Documents, prepare list of deferred submittals, and incorporate line item for each submittal in construction progress schedule and submittal schedule.
- B. Responsibility for Coordination and Scheduling:
1. General Contractor is responsible for scheduling and coordinating deferred submittal approval items including engineering, approvals, testing and inspections, installation and final Authority Having Jurisdiction approvals.
 2. Conduct general deferred-approval-process meeting to review deferred approval items, including Contractor's responsibilities and action plan.
- C. Responsibility for Completeness of Submittal Data, to be Included with Deferred Submittal Approval Packages:
1. Submittals, including shop drawings, product data, certifications, and other related data, are generally required to be included with deferred submittal approval packages.
 2. General contractor shall review and coordinate impact of items identified in deferred submittals list on adjacent building systems, substrates, and substructures where these items are installed.

1.05 SUBMITTALS

- A. General:
1. See Section 01 3000 - Administrative Requirements, for submittal procedures.

2. Comply with submittal requirements indicated in individual specifications sections for deferred submittal approval items.
 3. Comply with submittal requirements for Authority Having Jurisdiction deferred submittal approval items, including requirements above and beyond requirements for other Contract Document submittals.
- B. Product Data: Provide for each type of product indicated.
- C. Shop Drawings: Prepared by or under direct supervision of a qualified professional engineer.
1. Include engineering, design, certifications, and data, signed and sealed by registered professional engineer responsible for their preparation.
- D. Closeout Items: Original documentation of approvals and associated documents, including stamps and notations by Authority Having Jurisdiction on deferred approval documents, that were required or reviewed during successful completion of the approval process.
1. Provide documentation for each deferred approval item indicated.
 2. Organize documents into separate packages for each separate deferred approval item indicated. Title each package "DEFERRED SUBMITTAL APPROVAL INFORMATION FOR [insert title of deferred approval item]".

PART 2 PRODUCTS: NOT USED.

PART 3 EXECUTION: NOT USED.

END OF SECTION

**SECTION 01 5000
TEMPORARY FACILITIES AND CONTROLS**

PART 1 GENERAL V.22

1.01 SECTION INCLUDES

- A. Temporary utilities.
- B. Temporary telecommunications services.
- C. Temporary sanitary facilities.
- D. Temporary Controls: Barriers, enclosures, and fencing.
- E. Security requirements.
- F. Vehicular access and parking.
- G. Waste removal facilities and services.
- H. Project identification sign.
- I. Field offices.

1.02 TEMPORARY UTILITIES

- A. Owner will provide the following:
 - 1. Electrical power , consisting of connection to existing facilities.
 - 2. Water supply, consisting of connection to existing facilities.
- B. Provide and pay for all lighting, heating and cooling, and ventilation required for construction purposes.
- C. Existing facilities may not be used.
- D. Use trigger-operated nozzles for water hoses, to avoid waste of water.

1.03 TELECOMMUNICATIONS SERVICES

- A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
- B. Provide telephone, cellular phone, and high-speed internet connection to jobsite.
- C. Provide on jobsite capacity of viewing and printing out physical copies of electronic versions of construction documents, submittals, RFIs, ASI, etc.

1.04 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- B. Maintain daily in clean and sanitary condition.

1.05 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.06 FENCING

- A. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.
- B. Used material may be used for construction fence. Provide duplicate keys of any gate lock to Owner. Contractor to be responsible for maintenance of fence for duration of project.

1.07 SECURITY

- A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

1.08 VEHICULAR ACCESS AND PARKING

- A. Coordinate access and haul routes with governing authorities and Owner.
- B. Provide and maintain access to fire hydrants, free of obstructions.
- C. Provide means of removing mud from vehicle wheels before entering streets.
- D. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.09 WASTE REMOVAL

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. Provide containers with lids. Remove trash from site periodically.
- C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
- D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.10 PROJECT IDENTIFICATION

- A. Provide project identification sign of design and construction as detailed by Architect.
- B. Erect on site at location established by Architect.
- C. Project Identification Signs:
 - 1. One painted sign, 64 square feet area, bottom 3 feet above ground.
 - 2. Content:
 - a. Project title, logo and name of Owner as indicated on Contract Documents.
 - b. Names and titles of authorities.
 - c. Names and titles of Architect/Engineer.
 - d. Name of Prime Contractor.
 - 3. Graphic Design, Colors, Style of Lettering: Designated by Architect/Engineer.
- D. Sign Materials:
 - 1. Structure and Framing: New wood, structurally adequate.
 - 2. Sign Surfaces: Exterior grade plywood with medium density overlay, minimum 3/4-inch thick, standard large sizes to minimize joints.
 - 3. Paint and Primers: Exterior quality, two coats; sign background of color as selected.
 - 4. Lettering: Exterior quality paint, contrasting colors as selected.
- E. Installation:
 - 1. Install project identification signs within 15 days after date fixed by Notice to Proceed.
 - 2. Erect at location directed by the Architect.
 - 3. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.
 - 4. Install signs surface plumb and level, with butt joints. Anchor securely.
 - 5. Paint exposed surfaces of signs, supports, and framing.
- F. Maintenance: Maintain signs and supports clean, repair deterioration and damage.
- G. Removal: Remove signs, framing, supports, and foundations at completion of Project and restore the area.
- H. No other signs are allowed without Owner permission except those required by law.

1.11 FIELD OFFICES

- A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack, and drawing display table.
- B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.
- C. Locate offices a minimum distance of 30 feet from existing and new structures.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

**SECTION 01 6000
PRODUCT REQUIREMENTS**

PART 1 GENERAL V.22

1.01 SECTION INCLUDES

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

1.02 REFERENCE STANDARDS

- A. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 SUBMITTALS

- A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
 - 1. Submit within 15 days after date of Agreement.
 - 2. For products specified only by reference standards, list applicable reference standards.
- B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, manufacturer warranties and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- C. 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.
- D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

- A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.
- B. 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.
- C. Reused Products: Reused products include materials and equipment previously used in this or other construction, salvaged and refurbished as specified.

2.02 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by Contract Documents.
- B. Use of products having any of the following characteristics is not permitted:
 - 1. Made of wood from newly cut old growth timber.
- C. Where other criteria are met, Contractor shall give preference to products that:
 - 1. If used on interior, have lower emissions.
 - 2. If wet-applied, have lower VOC content.

3. Are extracted, harvested, and/or manufactured closer to the location of the project.
4. Have longer documented life span under normal use.
5. Result in less construction waste.
6. Are made of recycled materials.
7. Are Cradle-to-Cradle Certified.
8. Have a published GreenScreen Chemical Hazard Analysis.

D. Provide interchangeable components of the same manufacture for components being replaced.

2.03 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 MAINTENANCE MATERIALS

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

2.05 WARRANTY

- A. For all products, where no specific extended warranty period has been identified, provide no less than manufacturer's standard warranty for product line for quality grade specified.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

- A. See Section 01 2500 - Substitution Procedures.

3.02 OWNER-SUPPLIED PRODUCTS

- A. Owner's Responsibilities:
 1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
 2. Arrange and pay for product delivery to site.
 3. On delivery, inspect products jointly with Contractor.
 4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
 5. Arrange for manufacturers' warranties, inspections, and service.
- B. Contractor's Responsibilities:
 1. Review Owner reviewed shop drawings, product data, and samples. Notify Owner and Architect immediately if supplied product affects installed final work.
 2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
 3. Handle, store, install and finish products.
 4. Repair or replace items damaged after receipt.

3.03 TRANSPORTATION AND HANDLING

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

- D. Transport and handle products in accordance with manufacturer's instructions.
- E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
- H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

- A. 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.
- B. Store and protect products in accordance with manufacturers' instructions.
- C. Store with seals and labels intact and legible.
- D. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.
- E. For exterior storage of fabricated products, place on sloped supports above ground.
- F. Provide off-site storage and protection when site does not permit on-site storage or protection.
- G. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- H. Comply with manufacturer's warranty conditions, if any.
- I. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- J. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- K. Prevent contact with material that may cause corrosion, discoloration, or staining.
- L. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- M. 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

**SECTION 01 7000
EXECUTION AND CLOSEOUT REQUIREMENTS**

PART 1 GENERAL V.22

1.01 SECTION INCLUDES

- A. Examination, preparation, and general installation procedures.
- B. Requirements for alterations work, and selective demolition.
- C. Pre-installation meetings.
- D. Cutting and patching.
- E. Surveying for laying out the work.
- F. Cleaning and protection.
- G. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

1.02 REFERENCE STANDARDS

- A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
 - 1. On request, submit documentation verifying accuracy of survey work.
 - 2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in compliance with Contract Documents.
 - 3. Submit surveys and survey logs for the project record.
- C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
 - 1. Structural integrity of any element of Project.
 - 2. Integrity of weather exposed or moisture resistant element.
 - 3. Efficiency, maintenance, or safety of any operational element.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of Owner or separate Contractor.

1.04 QUALIFICATIONS

- A. For surveying work, employ a land surveyor registered in the State of Arkansas and acceptable to Architect. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities.

1.05 PROJECT CONDITIONS

- A. Use of explosives is not permitted.
- B. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

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 four 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. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- D. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
- F. Utilize recognized engineering survey practices.
- G. 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, and ground floor elevations.
- H. Periodically verify layouts by same means.
- I. 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 casual field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as indicated.
 - 2. Report discrepancies to Architect before disturbing existing installation.
 - 3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. Remove existing work as indicated and as required to accomplish new work.
 - 1. Remove items indicated on drawings.
 - 2. Relocate items indicated on drawings.
 - 3. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
 - 4. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
- C. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.

1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
 2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
 3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 - a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
 - b. Provide temporary connections as required to maintain existing systems in service.
 4. Verify that abandoned services serve only abandoned facilities.
 5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.
- D. Protect existing work to remain.
1. Prevent movement of structure; provide shoring and bracing if necessary.
 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 3. Repair adjacent construction and finishes damaged during removal work.
- E. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
- F. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.
- G. Refinish existing surfaces as indicated:
1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
 2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.
- H. Clean existing systems and equipment.
- I. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.
- J. Do not begin new construction in alterations areas before demolition is complete.
- K. 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 work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- E. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- G. Restore work with new products in accordance with requirements of Contract Documents.
- H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- I. 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.
- J. 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.

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 ADJUSTING

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

3.11 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.

3.12 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities.
- 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 Architect's Substantial Completion inspection.
- 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.
- H. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion. When each item is completed, have each item initialled by Project Superintendent and dated when completed. Include in project closeout documentation.

END OF SECTION

**SECTION 01 7800
CLOSEOUT SUBMITTALS**

PART 1 GENERAL V.22

1.01 SECTION INCLUDES

- A. Project Completion Documents.
- B. Project Record Documents.
- C. Operation and Maintenance Manuals.
- D. Warranties and bonds.

1.02 SUBMITTALS

- A. Close Out Document Manuals: All information to be scanned to digital format and submitted to Architect. Retain all hard copies for one complete set for the Owner. Submit complete sets of the following:
 - 1. Project Completion Documents:
 - 2. Project Record Documents:
 - 3. Operation and Maintenance Manuals:
- B. Final Application for Payment: Submit fully executed

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT COMPLETION DOCUMENTS

- A. Project Directory: Include list of all Contractors, Owner, Architects, Engineers, Subcontractor and prime material suppliers. List to include trade involved, primary contact name, phone number, mailing address and email address.
- B. Waiver of Liens: Provide for all trades and prime material suppliers.
- C. Warranties: Submit for contractors installation warranty, manufacturer's warranties and warranties for equipment or component parts of equipment. Warranty begins on the date of acceptance
 - 1. Submit for contractors installation warranty, manufacturer's warranties and warranties for equipment or component parts of equipment.
 - 2. Warranties begin on the Date of Substantial Completion, unless delayed or specifically excluded.
 - 3. For items of Work for which acceptance is delayed beyond the Date of Substantial Completion, the listing date of acceptance is the beginning of the warranty period.
 - 4. Verify that documents are in proper form, contain full information, and are notarized.
 - 5. Include originals of each in operation and maintenance manuals, indexed separately on Table of Contents.
- D. Certificate of Substantial Completion: Provide fully executed form with punch list attached.
- E. Contractor's Punch List: Provide completed list of items requiring completion or correction. Include any attachments for revisions provided by Architect and/or Engineer. Punch list should be noted that all items were corrected and completed with trade responsible identified.
- F. Certificate of Occupancy: Provide form as issued for authority having jurisdiction.
- G. Consent of Surety: Provide fully executed surety letter when project has associated bonds provided by contractor.

3.02 PROJECT RECORD DOCUMENTS

- A. Record Drawings : Legibly mark construction drawings with each item to record actual construction including the following:
 - 1. Measured depths of foundations in relation to finish first floor datum.

2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 4. Field changes of dimension and detail.
 5. Details not on original Contract drawings.
 6. Changes made by Addenda and Change Orders.
 7. Record information concurrent with construction progress.
- B. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
1. Manufacturer's name and product model and number.
 2. Product substitutions or alternates utilized.
 3. Changes made by Addenda, Change Orders and other modifications.
- C. Addenda: Insure all addenda items have been included and posted to record documents.
- D. Change Orders: Include all executed Change Orders, Allowance purchases and other modifications to the contract.
- E. Submittals, Shop Drawings, Product Data and Samples:
1. Shop Drawings: Include records of manufacturer's instruction for assembly, installation and adjusting.
 2. Product Data: Include list of all products and model number provided.
 3. Samples: Include material samples of all selected interior finishes. Samples to include label indicating manufacturer, product model number, color, finish and other identifying elements. Full color photographs are acceptable for larger samples.
- F. Test Reports and Special Inspections:
- G. Maintain on site a complete set of record documents; record actual revisions to the Work:
- H. Ensure entries are complete and accurate, enabling future reference by Owner.
- I. Store record documents separate from documents used for construction.
- J. Record information concurrent with construction progress.

3.03 OPERATION AND MAINTENANCE MANUAL GENERAL

- 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.

3.04 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

- A. For Each Product, Applied Material, and Finish:
 1. Product data, with catalog number, size, composition, and color and texture designations.
 2. Information for re-ordering custom manufactured products.
- 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.

3.05 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. Provide schedule of all equipment that require instruction on operation and/or continual maintenance. Coordinate instruction for all equipment with Owner and/or Owner's Representative and record name and contact information of all in attendance. Video recording of instructions provided is recommended.
- B. 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.
- 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.
- D. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
- E. 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.
- F. 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.
- G. Provide servicing and lubrication schedule, and list of lubricants required.
- H. Include manufacturer's printed operation and maintenance instructions.
- I. Include sequence of operation by controls manufacturer.
- J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- K. Additional Requirements: As specified in individual product specification sections.

3.06 CLOSE OUT DOCUMENT MANUALS

- A. Provide all Close Out information in digital format, saved in PDF files, and neatly organized for ease of navigation. Arrange by Specification Sections as Table of Contents. Architect can provide file format for use as needed.
- B. Where paper documents are provided by manufacturers, scan into records and combine and include into Hard Copy Close Out Documents.
- C. 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.
- D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- E. 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.
- F. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.
- G. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- H. Arrange content by systems under specification section numbers and sequence of Table of Contents of this Project Manual.

- I. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
 - 1. Operating instructions.
 - 2. Maintenance instructions for equipment and systems.
 - 3. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
 - 4. Air and water balance reports.
 - 5. Certificates.
 - 6. Photocopies of warranties and bonds.
- J. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.
- K. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect , Consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.
- L. Arrange digital PDF copies of documents in similar fashion using file folders. Name file type with simple explanation of contents using shortest file names type possible. Provide digital files on flash USB drives.
- M. Provide owner training videos saved electronically and transmitted in USB drives. Provide sign-in sheets for all attendees for Owner Training sessions and include in closeouts.

END OF SECTION

**SECTION 03 3511
CONCRETE FLOOR FINISHES**

PART 1 GENERAL V.24

1.01 SECTION INCLUDES

- A. Surface treatments for concrete floors and slabs.

1.02 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the work with concrete floor placement and concrete floor curing.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's published data on each finishing product, including information on compatibility of different products and limitations.
- C. Maintenance Data: Provide data on maintenance and renewal of applied finishes.

1.04 MOCK-UP

- A. For coatings, construct mock-up area under conditions similar to those that will exist during application, with coatings applied.
- B. Mock-Up Size: 10 feet square.
- C. Locate where directed and may remain as part of final work.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's sealed packaging, including application instructions.

1.06 FIELD CONDITIONS

- A. Maintain light level equivalent to a minimum 200 W light source at 8 feet above the floor surface over each 20 foot square area of floor being finished.
- B. Maintain ambient temperature of 50 degrees F minimum.

PART 2 PRODUCTS

2.01 CONCRETE FLOOR FINISH APPLICATIONS

- A. SLC-01: Aliphatic Urethane Clear Sealer:
 - 1. Use at the following locations: All locations SLC-01 in finish schedule.

2.02 COATINGS

- A. Clear Topical Sealer:
 - 1. Composition: Aliphatic Urethane- Single Component - Clear.
 - 2. Products:
 - a. Elite Crete: AUS-V: www.elitecrete.com
 - b. Euclid Chemical Company: www.euclidchemical.com
 - c. Sika Corporation: www.sikausa.com
 - d. Substitutions: See Section 01 6000 - Product Requirements.
- B. High Gloss Clear Coating: Transparent, non-yellowing, water-based coating.
 - 1. Composition: Acrylic polymer-based.
 - 2. Nonvolatile Content: 15 percent, minimum, when measured by volume.
 - 3. Products:
 - a. PROSOCO, Inc; LSGuard: www.prosoco.com/consolideck/#sle.
 - b. SpecChem, LLC; Aqua Shine: www.specchemllc.com/#sle.
 - c. W. R. Meadows, Inc; Deck-O-Grip W/B (slip-resistant): www.wrmeadows.com/#sle.
 - d. Buckeye International; Proclaim: www.buckeyeinternational.com.
- C. Accessories:
 - 1. Primers.

2. Cleaning agents.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that floor surfaces are acceptable to receive the work of this section.
- B. Verify that flaws in concrete have been patched and joints filled with methods and materials suitable for further finishes.

3.02 GENERAL

- A. Apply materials in accordance with manufacturer's instructions.

3.03 COATING APPLICATION

- A. Verify that surface is free of previous coatings, sealers, curing compounds, water repellents, laitance, efflorescence, fats, oils, grease, wax, soluble salts, residues from cleaning agents, and other impediments to adhesion.
- B. Remove all construction dirt, debris, staining, paint, sealants, mastic, drywall joint compound, etc. from surface of concrete to provide a blemish free surface. Physical and mechanical cleaning required; chemical cleaning may be necessary upon approval only. The use of light sanding and/or polish grinding is acceptable at hard to clean surfaces.
- C. Protect adjacent non-coated areas from drips, overflow, and overspray; immediately remove excess material.
- D. Apply primers and coatings in accordance with manufacturer's instructions, matching approved mock-ups for color, special effects, sealing and workmanship.

END OF SECTION

**SECTION 04 0511
MASONRY MORTARING AND GROUTING**

PART 1 GENERAL V.22

1.01 SECTION INCLUDES

- A. Mortar for masonry.
- B. Grout for masonry.

1.02 REFERENCE STANDARDS

- A. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2016.
- B. ASTM C5 - Standard Specification for Quicklime for Structural Purposes; 2010.
- C. ASTM C91/C91M - Standard Specification for Masonry Cement; 2012.
- D. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2015.
- E. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2011.
- F. ASTM C150/C150M - Standard Specification for Portland Cement; 2015.
- G. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2006 (Reapproved 2011).
- H. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2014a.
- I. ASTM C387/C387M - Standard Specification for Packaged, Dry, Combined Materials for Concrete and High Strength Mortar; 2011b.
- J. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2011.
- K. ASTM C476 - Standard Specification for Grout for Masonry; 2010.
- L. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2012.
- M. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2010.
- N. ASTM C1019 - Standard Test Method for Sampling and Testing Grout; 2013.
- O. ASTM C1072 - Standard Test Method for Measurement of Masonry Flexural Bond Strength; 2013.
- P. ASTM C1148 - Standard Test Method for Measuring the Drying Shrinkage of Masonry Mortar; 1992a (Reapproved 2008).
- Q. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms; 2014.
- R. ASTM E514/E514M - Standard Test Method for Water Penetration and Leakage Through Masonry; 2014.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Include design mix and indicate whether the Proportion or Property specification of ASTM C270 is to be used. Also include required environmental conditions and admixture limitations.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer's Installation Instructions: Submit packaged dry mortar manufacturer's installation instructions.

1.04 PRECONSTRUCTION TESTING

- A. Testing will be conducted by an independent test agency, in accordance with provisions of Section 01 4000 - Quality Requirements.

- B. Mortar Mixes: Test mortars prebatched by weight in accordance with ASTM C780 recommendations for preconstruction testing.
- C. Grout Mixes: Test grout batches in accordance with ASTM C1019 procedures.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

1.06 FIELD CONDITIONS

- A. Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

PART 2 PRODUCTS

2.01 MORTAR AND GROUT APPLICATIONS

- A. At Contractor's option, mortar and grout may be field-mixed from packaged dry materials, made from factory premixed dry materials with addition of water only, or ready-mixed.

2.02 MATERIALS

- A. Packaged Dry Material for Mortar for Unit Masonry: Premixed Portland cement, hydrated lime, and sand; complying with ASTM C387/C387M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.
 1. Type: Types as scheduled in this section.
 2. Color: Mineral pigments added as required to produce approved color sample.
 3. Manufacturers:
 - a. Substitutions: See Section 01 6000 - Product Requirements.
- B. Packaged Dry Material for Grout for Masonry: Premixed cementitious materials and dried aggregates; capable of producing grout of the specified strength in accordance with ASTM C476 with the addition of water only.
- C. Portland Cement: ASTM C150/C150M.
 1. Type: Type I - Normal; ASTM C150/C150M.
 2. Color: Standard gray.
- D. Masonry Cement: ASTM C91/C91M.
 1. Type: Type N; ASTM C91/C91M.
- E. Blended Masonry and Portland Cement Grout: ASTM C476.
- F. Packaged Dry Mortar: ASTM C387/C387M, Type N or S, using gray or white color cement as required to achieve desired mortar color.
- G. Hydrated Lime: ASTM C207, Type S.
- H. Quicklime: ASTM C5, non-hydraulic type.
- I. Mortar Aggregate: ASTM C144.
- J. Grout Aggregate: ASTM C404.
- K. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
 1. Color(s): To match Architect's sample(s) when incorporated into specified mix design(s).
 2. Manufacturers:
 - a. Davis Colors: www.daviscolors.com/#sle.
 - b. Lambert Corporation: www.lambertusa.com/#sle.
 - c. Solomon Colors: www.solomoncolors.com.
 - d. Substitutions: See Section 01 6000 - Product Requirements.
- L. Water: Clean and potable.
- M. Bonding Agent: Latex type.

- N. Integral Water Repellent Admixture: Polymeric liquid admixture added to mortar at the time of manufacture.
1. Performance of Mortar with Integral Water Repellent:
 - a. Water Permeance: When tested per ASTM E514/E514M and for a minimum of 72 hours:
 - 1) No water visible on back of wall above flashing at the end of 24 hours.
 - 2) No flow of water from flashing equal to or greater than 0.032 gallons per hour at the end of 24 hours.
 - 3) No more than 25 percent of wall area above flashing visibly damp at end of test.
 - b. Flexural Bond Strength: ASTM C1072; minimum 10 percent increase.
 - c. Compressive Strength: ASTM C1314; maximum 5 percent decrease.
 - d. Drying Shrinkage: ASTM C1148; maximum 5 percent increase in shrinkage.
 2. Use only in combination with masonry units produced with integral water repellent admixture.

2.03 MORTAR MIXES

- A. Ready Mixed Mortar: ASTM C1142, Type RN.
- B. Mortar for Unit Masonry: ASTM C270, Property Specification.

2.04 MORTAR MIXING

- A. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM C270 and in quantities needed for immediate use.
- B. Maintain sand uniformly damp immediately before the mixing process.
- C. Do not use anti-freeze compounds to lower the freezing point of mortar.
- D. If water is lost by evaporation, re-temper only within two hours of mixing.

2.05 GROUT MIXES

- A. Bond Beams, Lintels, and Reinforced Cells: 3,000 psi strength at 28 days; 8-10 inches slump; provide premixed type in accordance with ASTM C 94/C 94M.
 1. Fine grout for spaces with smallest horizontal dimension of 2 inches or less.

2.06 GROUT MIXING

- A. Mix grout in accordance with ASTM C94/C94M.
- B. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C476 for fine and coarse grout.
- C. Add admixtures in accordance with manufacturer's instructions; mix uniformly.
- D. Do not use anti-freeze compounds to lower the freezing point of grout.

PART 3 EXECUTION

3.01 PREPARATION

- A. Apply bonding agent to existing concrete surfaces.
- B. Plug clean-out holes for grouted masonry with brick masonry units. Brace masonry to resist wet grout pressure.
- C. Perform practices for cold or hot weather requirements.

3.02 INSTALLATION

- A. Install mortar and grout to requirements of section(s) in which masonry is specified.
- B. Work grout into masonry cores and cavities to eliminate voids.
- C. Do not install grout in lifts greater than 16 inches without consolidating grout by rodding.
- D. Do not displace reinforcement while placing grout.
- E. Remove excess mortar from grout spaces.

3.03 GROUTING

- A. Perform all grouting by means of low-lift technique. Do not employ high-lift grouting.
- B. Low-Lift Grouting:
 - 1. Limit height of pours to 60 inches maximum for fine and course grout with 2 inches maintained clearances around reinforcing. Refer to structural drawings for additional restrictions.
 - 2. Limit height of masonry to 16 inches above each pour.
 - 3. Pour grout only after vertical reinforcing is in place; place horizontal reinforcing as grout is poured. Prevent displacement of bars as grout is poured.
 - 4. Place grout for each pour continuously and consolidate immediately; do not interrupt pours for more than 1-1/2 hours.

3.04 FINAL TOUCH UP

- A. CLEANING: Clean mortar from masonry or masonry veneer to observe mortar color tone / consistency.
- B. Stain surface of exposed mortar as required where discoloration of mortar appears from field tone/color. Repeat as necessary to obtain consistent color tone. Coordinate locations requiring staining with architect.

END OF SECTION

**SECTION 04 2000
UNIT MASONRY**

PART 1 GENERAL V.22

1.01 SECTION INCLUDES

- A. Concrete block.
- B. Concrete building brick.
- C. Concrete facing brick.
- D. Clay facing brick.
- E. Reinforcement and anchorage.
- F. Flashings.
- G. Accessories.

1.02 REFERENCE STANDARDS

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- B. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement; 2015.
- C. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2009a (Reapproved 2014).
- D. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2011.
- E. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2015.
- F. ASTM C55 - Standard Specification for Concrete Building Brick; 2011.
- G. ASTM C67/C67M - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile; 2018.
- H. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2014.
- I. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2011.
- J. ASTM C140/C140M - Standard Test Methods of Sampling and Testing Concrete Masonry Units and Related Units; 2014.
- K. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale); 2014.
- L. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2012.
- M. ASTM C1634 - Standard Specification for Concrete Facing Brick; 2011.
- N. BIA Technical Notes No. 28B - Brick Veneer/Cold-Formed Steel Framed Walls; 2025.
- O. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing; 2005.
- P. BIA Technical Notes No. 13 - Ceramic Glazed Brick Exterior Walls; 2017.
- Q. BIA Technical Notes No. 46 - Maintenance of Brick Masonry; 2005.
- R. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2016.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all relevant installers. Mock-up to be complete and approved prior to scheduling meeting.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.
- C. Samples: Submit four samples of decorative block units to illustrate color, texture, and extremes of color range.

1.05 MOCK-UP

- A. Construct a masonry wall as a mock-up panel sized 6 feet long by 6 feet high; with full masonry system to include mortar, accessories, structural backup, wall openings, flashings (with lap joint, corner, and end dam), wall insulation, and final cleaning in mock-up.
- B. Locate where directed.
- C. Mock-up may not remain as part of the Work, unless approved by Architect.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.
- B. Handle and store ceramic glazed masonry units and pre-faced concrete block units in protective cartons or trays. Do not remove from protective packaging until ready for installation.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

- A. Concrete Block: Comply with referenced standards and as follows:
 - 1. Size: Standard units with nominal face dimensions of 16 by 8 inches and nominal depths as indicated on drawings for specific locations.
 - 2. Special Shapes: Provide non-standard blocks configured for corners.
 - a. Provide bullnose units for outside corners.
 - 3. Load-Bearing Units: ASTM C90, normal weight.
 - a. Hollow block, as indicated.
 - 4. Non-Loadbearing Units: ASTM C129.
- B. Concrete Brick:
 - 1. Size: As indicated on drawings.
 - 2. Concrete Building Brick: ASTM C55; lightweight, solid, for interior or concealed use.
 - 3. Concrete Facing Brick: ASTM C1634; solid, lightweight; for architectural, paver, and below grade use.

2.02 BRICK UNITS

- A. Manufacturers:
 - 1. Acme Brick Company; : www.brick.com
 - 2. Substitutions: See section 01 6000 - Product Requirements.
- B. Facing Brick (BR-1): ASTM C216, Type FBS Valour, Grade SW.
 - 1. Color and texture: Perla Plant, Color: Shamrock
 - 2. Nominal size: As indicated on drawings.
 - 3. Special shapes: Molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect.
- C. Facing Brick (BR-2): ASTM C216, Type FBS Valour, Grade SW.
 - 1. Color and texture: Perla Plant, Color: Marble Gray
 - 2. Nominal size: As indicated on drawings.
 - 3. Special shapes: Molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect.

2.03 MORTAR AND GROUT MATERIALS

- A. Mortar and Grout: As specified in Section 04 0511.

2.04 REINFORCEMENT AND ANCHORAGE

- A. Manufacturers:
1. Blok-Lok Limited: www.blok-lok.com.
 2. Hohmann & Barnard, Inc; www.h-b.com/#sle.
 3. WIRE-BOND www.wirebond.com/#sle.
 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Reinforcing Steel: ASTM A615/A615M, Grade 40 (40,000 psi), deformed billet bars; galvanized.
- C. Joint Reinforcement: Use ladder type joint reinforcement where vertical reinforcement is involved and truss type elsewhere, unless otherwise indicated.
- D. Single Wythe Joint Reinforcement: ASTM A951/A951M.
1. Type: Truss or ladder.
 2. Material: ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M Class 3.
 3. Size: 0.1483 inch side rods with 0.1483 inch cross rods; width as required to provide not less than 5/8 inch of mortar coverage on each exposure.
- E. Multiple Wythe Joint Reinforcement: ASTM A951/A951M.
1. Type: Truss.
 2. Material: ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M Class 3.
 3. Size: 0.1483 inch side rods with 0.1483 inch cross rods; width as required to provide not less than 5/8 inch of mortar coverage on each exposure.
- F. Adjustable Multiple Wythe Joint Reinforcement: ASTM A951/A951M.
1. Type: Truss, with adjustable ties or tabs spaced at 16 in on center.
 2. Material: ASTM A1064/A1064M steel wire, hot dip galvanized after fabrication to ASTM A153/A153M Class B.
 3. Size: 0.1875 inch side rods with 0.1483 inch cross rods and adjustable components of 0.1875 inch wire, width of components as required to provide not less than 5/8 inch of mortar coverage from each masonry face.
- G. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
1. Concrete or CMU backing: Dovetail anchors of bent steel strap, nominal 1 inch width x 0.024 inch thick, with trapezoidal wire ties 0.1875 inch thick, hot dipped galvanized to ASTM A 153/A 153M, Class B, installed in recessed dovetail slot or surface mounted to face of wall.
 2. Steel or Wood Stud backing: 2 piece anchor designed for use with continuous insulation and contains gasketing for sealing at weather barrier penetration.
 - a. Manufacturers:
 - 1) Hohmann and Barnard: 2-seal or approved equal. www.h-b.com.
 - 2) Rodenhouse: Pos-i-tie Veneer Anchoring System. Thermal Grip Brick Tie Washer. www.rodenhouse-inc.com
 - 3) Heckmann Building Products: Pos-i-tie Veneer Anchoring System. www.heckmannbuildingprods.com
 - b. Anchor plates: Not less than 0.075 inch thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
 - c. Wire ties: Manufacturer's standard shape, 0.1875 inch thick.
 - d. Vertical adjustment: Not less than 2 inches.

- e. Seismic Feature: Provide lip, hook, or clip on end of wire ties to engage or enclose not less than one continuous horizontal joint reinforcement wire of 0.1483 inch diameter. Provide when project is located in Seismic Zone D or per Structural Plans indicate.

2.05 FLASHINGS

- A. Copper/Polymer Film or Fabric Flashing: 5 oz/sq ft copper sheet laminated between two sheets of polymer or fiberglass fiber-reinforced film.
 - 1. Manufacturers:
 - a. Hohmann & Barnard, Inc; Copper-Fabric NA: www.h-b.com/#sle.
 - b. York Manufacturing, Inc; Multi-Flash 500 Series: www.yorkmfg.com/#sle.
 - c. WireBond Copper Seal Flash. www.wirebond.com
 - d. Substitutions: See Section 01 6000 - Product Requirements.
- B. Termination Bars: Stainless steel or aluminum; compatible with membrane and adhesives.
- C. Lap Sealants and Tapes: As recommended by flashing manufacturer; compatible with membrane and adhesives.

2.06 ACCESSORIES

- A. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
 - 1. Mortar Diverter: Semi-rigid mesh designed for installation at flashing locations.
 - a. Manufacturers:
 - 1) Mortar Net Solutions; MortarNet: www.mortarnet.com/#sle.
 - 2) CavClear/Archovations, Inc: www.cavclear.com.
 - 3) Substitutions: See Section 01 6000 - Product Requirements.
- B. Weeps:
 - 1. Type: Polyester mesh.
- C. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.
- D. Steel Loose Lintels: Steel, hot dipped galvanized. See Division 05.
- E. Sand; white or tan for use on masonry joint sealants.

PART 3 EXECUTION

3.01 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
- B. Protect all substrates from damage during placement of masonry. Repair any damage caused to substrate prior to concealing with masonry.
- C. Coordinate installation requirements of this section of load-bearing and non-load bearing CMU walls with Structural drawings. The more stringent instruction of the two takes precedent.
- D. Coordinate the installation in of any recessed items in masonry walls with other trades. Do not conceal work of other trades prior to their completion.

3.02 COLD AND HOT WEATHER REQUIREMENTS

- A. Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.
- B. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.
- C. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

3.03 COURSING

- A. Establish lines, levels, and coursing indicated. Protect from displacement.

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- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Concrete Masonry Units:
 - 1. Bond: Running.
 - 2. Coursing: One unit and one mortar joint to equal 8 inches.
 - 3. Mortar Joints: Concave.
- D. Brick Units:
 - 1. Bond: Running.
 - 2. Coursing: Three units and three mortar joints to equal 8 inches.
 - 3. Mortar Joints: Concave.

3.04 PLACING AND BONDING

- A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
- B. Lay hollow masonry units with face shell bedding on head and bed joints.

3.05 WEEPS/CAVITY VENTS

- A. Install weeps in veneer and cavity walls at 24 inches on center horizontally above through-wall flashing, above shelf angles and lintels, and at bottom of walls, minimum of two weeps per opening.

3.06 CAVITY MORTAR CONTROL

- A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.
- B. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents. Mortar diverter to be installed in full depth of masonry air cavity.

3.07 REINFORCEMENT AND ANCHORAGE - GENERAL

- A. Unless otherwise indicated on drawings or specified under specific wall or masonry type, install horizontal joint reinforcement 16 inches on center.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
- C. Place continuous joint reinforcement in first and second joint below top of walls.
- D. Lap joint reinforcement ends minimum 6 inches.
- E. Reinforce stack bonded unit joint corners and intersections with strap anchors 16 inches on center.
- F. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 16 inches horizontally and 16 inches vertically.

3.08 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

- A. Masonry Back-Up: Embed anchors to bond veneer at maximum 16 inches on center vertically and 16 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.
- B. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches on center vertically and 16 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.
- C. Masonry Veneer Anchors through Weather Barrier / Insulation:
 - 1. Installation before weather barrier: Ensure perimeter of anchors are smooth and consistent as required by weather barrier manufacturer.

2. Installation after weather barrier: Install as to not damage weather barrier. Patch any damage on the exterior with plastic flashing or sealant and patch holes on interior with sealant.
 3. Installation after weather barrier / rigid insulation: Install as to not damage weather barrier concealed behind rigid insulation board. Patch any holes or damage done to weather barrier from the exterior by removing rigid insulation and repairing with plastic flashing. Patch holes through weather barrier and sheathing from interior with sealant.
- D. Seismic Reinforcement: Connect veneer anchors with continuous horizontal wire reinforcement before embedding anchors in mortar.

3.09 MASONRY FLASHINGS

- A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
 1. Extend flashings full width at such interruptions and at least 4 inches into adjacent masonry or turn up at least 4 inches to form watertight pan at non-masonry construction. Ends of flashing to contain premanufactured or field folded water tight end dams.
 2. Remove or cover protrusions or sharp edges that could puncture flashings.
 3. Seal lapped ends and penetrations of flashing before covering with mortar.
- B. Terminate flashing up 8 inches minimum on vertical surface of backing:
 1. Anchor vertical leg of flashing into backing with a termination bar and sealant. Space fasteners for termination bar at no more than 12 inches on center and into solid blocking.
- C. Extend metal flashings to within 1/4 inch of exterior face of masonry. Flashing should not be visible from the exterior.
- D. Lap end joints of flashings at least 6 inches, minimum, and seal watertight with flashing sealant/adhesive.

3.10 LINTELS

- A. Refer to Structural Drawings for Lintel Schedule.
- B. Install loose steel lintels over openings. All exterior exposed steel used in lintels are to be hot dip galvanized.
- C. Refer to Lintel Schedule for minimum bearing dimension on each side of opening.
- D. Maintain minimum 4 inch bearing on each side of opening.

3.11 CONTROL AND EXPANSION JOINTS

- A. Do not continue horizontal joint reinforcement through control or expansion joints.
- B. Form control joint with a sheet building paper bond breaker fitted to one side of the hollow contour end of the block unit. Fill the resultant core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.
- C. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
- D. Size control joint in accordance with Section 07 9005 for sealant performance.
- E. Form expansion joint as detailed on drawings.
- F. Space masonry control joints at intervals no more than 20 feet apart horizontally and vertically and as indicated on drawings.

3.12 BUILT-IN WORK

- A. As work progresses, install built-in metal door frames and glazed frames and other items to be built into the work and furnished under other sections.
- B. Install built-in items plumb, level, and true to line.
- C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.

1. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.
- D. Do not build into masonry construction organic materials that are subject to deterioration.

3.13 TOLERANCES

- A. Maximum Variation from Alignment of Columns: 1/4 inch.
- B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
- C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
- D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
- F. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch.
- G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.14 CUTTING AND FITTING

- A. Cut and fit for chases, pipes, conduit, and sleeves. Coordinate with other sections of work to provide correct size, shape, and location.
- B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.15 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000. Coordinate test requirements with Structural Special Inspection per structural and ICC.
- B. Clay Masonry Unit Tests: Test each variety of clay masonry in accordance with ASTM C67/C67M requirements, sampling 5 randomly chosen units for each 50,000 installed.
- C. Concrete Masonry Unit Tests: Test each variety of concrete unit masonry in accordance with ASTM C140/C140M for compliance with requirements of this specification.
- D. Mortar Tests: Test each type of mortar in accordance with ASTM C780, testing with same frequency as masonry samples.

3.16 CLEANING

- A. Remove excess mortar and mortar droppings.
- B. Replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution. Clean faces of masonry no longer than 2 weeks from installation. Inadequate cleaning is considered defective work.
- D. Use non-metallic tools in cleaning operations.
- E. Stain surface of mortar where discoloration appears from field tone/color. Coordinate locations requiring staining with architect.

3.17 PROTECTION

- A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

**SECTION 04 2200
CONCRETE UNIT MASONRY**

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract and Division 01 Specification Sections apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Concrete masonry units.
 - 2. Mortar and grout.
 - 3. Steel reinforcing bars.
 - 4. Masonry joint reinforcement.
 - 5. Ties and anchors.
 - 6. Miscellaneous masonry accessories.

1.03 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.04 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Owner will engage a qualified independent testing agency to perform preconstruction testing indicated below. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense. The samples requiring testing indicated below shall be cast/formed at the same time from the same batches to establish a base line for each component and combination.
 - 1. Concrete Masonry Unit Test: For each type of unit required, according to ASTM C 140 for compressive strength. Testing for each type of unit required shall be performed and dated within 180 days prior to the Notice to Proceed date.
 - 2. Mortar Test (Compressive Strength): For each mix required, according to ASTM C 780. Testing for each mix required shall be performed and dated within 180 days prior to the Notice to Proceed date.
 - 3. Grout Test (Compressive Strength): For each mix required, according to ASTM C 1019. Testing for each mix required shall be performed and dated within 180 days prior to the Notice to Proceed date.
 - 4. Prism Test (Compressive Strength): For each combination of components required, (Concrete Masonry Units, Mortar, and Grout), according to ASTM C1314. Testing for each combination shall be performed and dated within 180 days prior to the Notice to Proceed date. For each combination perform two-7 day and three-28 day test for Concrete Masonry Unit and Mortar, no grout and each combination perform two-7 day and three-28 day test for Concrete Masonry Unit and Mortar, with grout, 10 total assemblies per combination required.

1.05 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Preconstruction testing data and results.
- C. Shop Drawings (include):
 - 1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
 - 2. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."
 - 3. Reinforcing Bar Positioners. See Contract Documents for dimensional requirements.
 - 4. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

1.06 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each type and size of the following:
 - 1. Masonry units.
 - 2. Cementitious materials. Include brand, type, component certifications and name of manufacturer.
 - 3. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
 - 4. Grout mixes. Include description of type and proportions of ingredients.
 - 5. Reinforcing bars.
 - 6. Joint reinforcement.
 - 7. Anchors, ties, and metal accessories.
- B. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.07 QUALITY ASSURANCE

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.
- C. Masonry Standard: Comply with TMS 402/602-16 unless modified by requirements in the Contract Documents.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry. Masonry units shall be placed on blocking or dunnage to prevent contact with soil and water.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp
- C. Store aggregates where grading and other required characteristics can be maintained, and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.
- F. Steel Reinforcement: Deliver, store and handle steel reinforcement to prevent bending and damage. Steel reinforcement shall be placed on blocking or dunnage to prevent contact with soil or water.

1.09 PROJECT CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 - 1. Extend cover a minimum of 24 inches down both sides of walls and hold cover securely in place.
- B. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.

3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- C. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 402/602-16.
1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than 7 days after completing cleaning.
- D. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 402/602-16.

PART 2 PRODUCTS

2.01 MASONRY UNITS, GENERAL

- A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.
- B. Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E 119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

2.02 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
 2. Provide square-edged units for outside corners unless otherwise indicated.
- B. CONCRETE MASONRY UNITS: ASTM C 90.
1. Density Classification: Normal weight.
 2. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.
- C. Concrete Building Brick: ASTM C 55.
1. Density Classification: Normal weight.

2.03 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Masonry Cement: ASTM C 91.
- D. Mortar Cement: ASTM C 1329.
- E. Aggregate for Mortar: ASTM C 144.
- F. Aggregate for Grout: ASTM C 404.
- G. Cold-Weather Admixture: Non-chloride, non-corrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
- H. Water: Potable.

2.04 REINFORCEMENT

- A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60.
- B. Masonry Joint Reinforcement, General: ASTM A 951/A 951M.
1. Interior Walls: Mill- galvanized, carbon steel.

2. Exterior Walls: Hot-dip galvanized, carbon steel.
 3. Wire Size for Side Rods: 0.148-inch diameter.
 4. Wire Size for Cross Rods: 0.148-inch diameter.
 5. Wire Size for Veneer Ties: 0.148-inch diameter.
 6. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
 7. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units.
- C. Masonry Joint Reinforcement for Single-Wythe Masonry: Either ladder or truss type with single pair of side rods.

2.05 TIES AND ANCHORS

- A. Adjustable Anchors for Connecting to Structural Steel Framing or Concrete: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

2.06 MISCELLANEOUS ANCHORS

- A. Anchor Bolts: Headed steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153/A 153M, Class C; of dimensions indicated.
- B. Post-installed Anchors: Chemical anchors.
1. Load Capacity: Capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.
 2. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941, Class Fe/Zn 5 unless otherwise indicated.
 3. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.

2.07 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Pre-molded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene urethane or PVC.
- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 or PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- C. Reinforcing Bar Positioners: Cold-drawn steel wire conforming to ASTM A1064/A1064M. Wire positioner designed to fit into mortar bed joints spanning masonry unit cells and hold reinforcing bars in position within cells. Wire Diameter 9 gauge (.148" or W1.7). Hot-dip galvanize after fabrication, ASTM A153/A153M-B2. Provide positioners designed for number of bars and size of bars indicated on Contract Documents. Hairpin Positioners are not permitted.

2.08 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
1. Do not use calcium chloride in mortar or grout.
 2. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide the type of mortar as indicated on drawings.
- C. Grout for Unit Masonry: Comply with ASTM C 476.
1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 3.2.1 in TMS 402/602-16 for dimensions of grout spaces and pour height.

2. Proportion grout in accordance with ASTM C 476, paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
3. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143/C 143M.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.
 2. Verify that foundations are within tolerances specified.
 3. Verify that reinforcing dowels are properly placed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION, GENERAL

- A. Build chases and recesses to accommodate items specified in this and other Sections.
- B. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.
- C. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- D. Masonry protection, cover the top of all unfinished masonry work to protect from moisture intrusion at the conclusion of work each day and during inclement weather producing precipitation.
- E. Cold weather installation per the requirements of TMS 602, section 1.8C.
- F. Hot weather installation per the requirements of TMS 602, section 1.8D.

3.03 TOLERANCES

- A. Dimensions and Locations of Elements:
 1. For dimensions in cross section or elevation do not vary by more than plus 1/2 inch or minus 1/4 inch.
 2. For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch.
 3. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.
- B. Lines and Levels:
 1. For bed joints and top surfaces of bearing walls do not vary from level by more than 1/4 inch in 10 feet, or 1/2 inch maximum.
 2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
 3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch maximum.
 4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
 5. For lines and surfaces do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch maximum.
 6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, or 1/2 inch maximum.
- C. Joints:
 1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.

2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch.

3.04 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
- C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4-inches. Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
- D. Stopping and Resuming Work: Stop work by racking back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar before laying fresh masonry.
- E. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.
 1. Install compressible filler in joint between top of partition and underside of structure above.
 2. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Section 078400 "Firestopping."

3.05 MORTAR BEDDING AND JOINTING

- A. Lay hollow CMUs as follows:
 1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
 2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.
 3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.
- B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
- D. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

3.06 MASONRY JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
 1. Place reinforcement not more than 16 inches O.C.
 2. Place reinforcement not more than 8 inches O.C. in foundation walls and parapet walls.
 3. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings in addition to continuous reinforcement.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units.
- D. Provide continuity at corners by using prefabricated L-shaped units.
- E. Cut and bend reinforcing units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.07 CONTROL AND EXPANSION JOINTS

- A. General: Install control and expansion joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.

3.08 LINTELS

- A. Provide masonry lintels where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels.
- B. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

3.09 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
 - 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
 - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in TMS 402/602-16.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
 - 1. Comply with requirements in TMS 402/602-16 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
 - 2. Limit height of vertical grout pours to not more than 60 inches.

3.10 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports in accordance with the International Building Code 2018, Chapter 17. Contractor shall allow inspectors access to scaffolding and work areas, as needed to perform tests and inspections. Retesting of materials that fail to meet specified requirements shall be done at Contractor's expense.
- B. Mortar and Grout Verification. Contractor shall submit reviewed mix design for mortar and grout to the testing agency and the special inspection agency prior to commencement of work.
 - 1. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140, Preconstruction only.
 - 2. Mortar Test: For each mix provided, according to ASTM C 780. Provide one test per 10,000 sf of wall.
 - 3. Grout Test: For each mix provided, according to ASTM C 1019. Perform test for each mix provided for each day's work. Provide one test per 5,000 sf of wall.
 - 4. Prism Test: For each combination of components required, (Concrete Masonry Units, Mortar, and Grout), according to ASTM C1314, Preconstruction only.
- C. Masonry preparation and placement:
 - 1. Verify proportions of site-prepared mortar.
 - 2. Verify masonry bearing surfaces are clean and free of debris.
 - 3. Verify masonry units are clean, sound and dry.
 - 4. Inspect placement of masonry units for:
 - a. Nominal unit widths. Size and location of structural elements
 - b. Layup. Stack or running bond as indicated on drawings.
 - c. Thickness and tooling of mortar joints.
 - d. Acceptable depth of furrowing of bed joints.
 - e. Construction, expansion and contraction joints for location and continuity of reinforcement.

- f. Note temperature. Verify proper application of hot and cold weather requirements.
 - g. Verify grout spaces are correctly sized and clean, cleanouts are closed after inspection and grout barriers are in place before grouting.
- D. Masonry Reinforcement:
- 1. Inspect placement and alignment of vertical bars and dowels for size, grade, and spacing. Inspect length of lap splices, clearances between bars, clearances to masonry units and outside face of walls and positioning of reinforcement.
 - 2. Inspect horizontal joint reinforcement and masonry reinforcement bars for size, length of lap splices, dowels, clearances between bars, clearances to masonry units and outside face of walls, and alignment.
 - 3. Inspect the installation of masonry anchors, including other details of anchorage of masonry to structural members, frames or other construction, for type, size and location.
 - 4. Verify all welding of reinforcing is in accordance with AWS D1.4. Verify proper joint preparation is provided and proper electrodes, properly dried and stored, are used. Verify weldability of reinforcing steel other than ASTM A706.
- E. Verify proper grouting procedures are used, including consolidation to approved height of grout space, reconsolidation and vibration.

3.11 REPAIRING AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- C. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 - 3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
 - 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
 - 5. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

3.12 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- B. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042200

**SECTION 04 4313
STONE MASONRY VENEER**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cut stone veneer at exterior walls.
- B. Adhered cut stone veneer at interior walls.
- C. Setting mortar.

1.02 RELATED REQUIREMENTS

- A. Section 04 0511 - Masonry Mortaring and Grouting: Setting and pointing mortar.
- B. Section 04 2000 - Unit Masonry: Joint reinforcement, Ties, and Anchors.
- C. Section 07 6200 - Sheet Metal Flashing and Trim: Flashings.
- D. Section 07 9200 - Joint Sealants: Sealing joints indicated to be left open for sealant.

1.03 REFERENCE STANDARDS

- A. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2016.
- A. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2014a.
- B. ASTM C1242 - Standard Guide for Selection, Design, and Installation of Dimension Stone Attachment Systems; 2018a.
- C. ASTM C1714/C1714M - Standard Specification for Preblended Dry Mortar Mix for Unit Masonry; 2016.
- D. ICC (IBC) - International Building Code; 2015.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Protect stone from discoloration during storage on site.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Stone Quarriers:
 - 1. Rock-It Natural Stone: <https://www.rock-itnaturalstone.com/or equal>.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.
- B. Stone Masonry Reinforcement and Accessories
 - 1. Hohmann & Barnard, Inc: www.h-b.com/#sle.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 STONE

- A. Stone: Rock-It - Austin Cream type, Full Bed Depth (Exterior), Thin Adhered Veneer (Interior) variety.
 - 1. Exterior: Install full bed depth.
 - 2. Interior: Install thin adhered veneer.

2.03 MORTAR APPLICATIONS

- A. At Contractor's option, mortar may be field-mixed from packaged dry materials, made from factory premixed dry materials with addition of water only, or ready-mixed.

2.04 MORTAR MIXES

- A. Packaged Dry Material for Mortar for Unit Masonry: Premixed Portland cement, hydrated lime, and sand; complying with ASTM C1714/C1714M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.
 - 1. Type: Type S.
 - 2. Color: Standard gray.

2.05 MORTAR

- A. Setting Mortar: ASTM C270, Type S, using the Proportion Method as specified in Section 04 0511.

2.06 ACCESSORIES

- A. Horizontal Joint Reinforcement: Truss type; stainless steel wire conforming to ASTM A580/A580M Type 304, 3/16 inch diameter side rods with 0.1483 inch diameter cross ties.
- B. Wall Ties: Formed steel wire, at least ___ inch diameter, stainless steel conforming to ASTM A580/A580M, eye and pintle type, with provision for vertical adjustment after attachment.
- C. Other Anchors in Direct Contact with Stone: ASTM A666 Type 304, stainless steel, of sizes and configurations required for support of stone and applicable superimposed loads.
- D. Flashings: ___ type as specified in Section 07 6200.
- E. Weep/Cavity Vents: Polyethylene tubing.

PART 3 EXECUTION

3.01 PREPARATION

- A. Establish lines, levels, and coursing. Protect from disturbance.
- B. Clean stone prior to erection. Do not use wire brushes or implements that mark or damage exposed surfaces.
- C. Clean sawn surfaces of rust stains and iron particles.

3.02 PREPARATION - ADHERED VENEER

- A. Dampen masonry surfaces to reduce excessive suction.
- B. Clean concrete surfaces of foreign matter using approved acid solutions, solvents, or detergents, and then rinse surfaces thoroughly with clean water.

3.03 INSTALLATION

- A. Install flashings of longest practical length and seal watertight to back-up. Lap end joints minimum 6 inches and seal watertight.
- B. Cut stone at site to produce clean faces.
- C. Size stone units to fit opening dimensions and perimeter conditions.
- D. Wet absorptive stone in preparation for placement to minimize moisture suction from mortar.
- E. Arrange stone pattern to provide color uniformity and minimize visual variations , and provide a uniform blend of stone unit sizes.
- F. Install weep/cavity vents in vertical stone joints at 24 inches on center horizontally; immediately above horizontal flashings, above shelf angles and supports, and at top of each cavity space; do not permit mortar accumulation in cavity space.

3.04 REINFORCEMENT AND ANCHORAGE

- A. Install horizontal joint reinforcement 16 inches on center.
- B. Place horizontal joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
- C. Place joint reinforcement continuous in first and second joint below top of walls.
- D. Embed wall ties in masonry back-up to bond veneer to back-up at maximum 16 inches on center vertically and 36 inches on center horizontally.
- E. In addition, place wall ties at maximum 3 inches on center each way around perimeter of openings, within 12 inches of openings.

3.05 INSTALLATION - ADHERED VENEER

- A. Install thin stone veneer with a cementitious mortar setting bed to a scratch coat backing surface, in accordance with stone fabricator's instructions and applicable sections of the ICC (IBC), TMS 402/602 and ASTM C1242 that apply to adhered masonry veneer.

3.06 INSTALLATION - MASONRY FLASHINGS

- A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.

END OF SECTION

**SECTION 05 5133
METAL LADDERS**

PART 1 GENERAL V-UNDER CONSTRUCTION

1.01 SECTION INCLUDES

- A. Shop-fabricated metal ladders.
- B. Prefabricated ladders.

1.02 REFERENCE STANDARDS

- A. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008 (Reaffirmed 2018).
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
- C. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.
- D. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- E. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2019.
- F. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
- G. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015.
- H. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2014, with Errata (2020).
- I. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc.; 2011.
- J. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
 - 1. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 2. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Designer's Qualification Statement.
- D. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.04 QUALITY ASSURANCE

- A. Design Ladders under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Arkansas.
- B. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.2/D1.2M and dated no more than 12 months before start of scheduled welding work.
- C. Fabricator Qualifications: A qualified steel fabricator that is accredited by IAS AC172.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

- A. Steel Sections: ASTM A36/A36M.
- B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.

- C. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- D. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.02 MATERIALS - ALUMINUM

- A. Extruded Aluminum: ASTM B211/B211M, 6063 alloy, T6 temper.
- B. Sheet Aluminum: ASTM B209/B209M, 5052 alloy, H32 or H22 temper.
- C. Aluminum-Alloy Bars: ASTM B211/B211M, 6061 alloy, T6 temper.

2.03 FABRICATED LADDERS

- A. Ladders: Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; prime paint finish.
 - 1. Side Rails: 3/8 by 2 inches members spaced at 20 inches.
 - 2. Rungs: One inch diameter solid round bar spaced 12 inches on center.
 - 3. Space rungs 7 inches from wall surface.

2.04 PREFABRICATED LADDERS

- A. Prefabricated Ladder: Welded metal unit complying with ANSI A14.3; factory fabricated to greatest degree practical and in the largest components possible.
 - 1. Components: Manufacturer's standard rails, rungs, treads, handrails, returns, platforms and safety devices complying with the requirements of the MATERIALS article of this section.
 - 2. Materials: Aluminum; ASTM B211/B211M 6063 alloy, T52 temper.
 - 3. Finish: Mill finish aluminum.
 - 4. Manufacturers:
 - a. Industrial Ladder & Scaffolding, Inc.; _____: www.anyladder.com/#sle.
 - b. O'Keeffe's Inc; Model 500: www.okeeffes.com/#sle.
 - c. Precision Ladders, LLC; Fixed Aluminium Wall Ladder: www.precisionladders.com/#sle.
 - d. Substitutions: See Section 01 6000 - Product Requirements.

2.05 ACCESSORIES:

- A. Personal Fall Arrest System:
 - 1. Provide at all ladders with overall climbing height in excess of 23 feet.
 - 2. Lifeline bar, attachment brackets, cable guide and other required components for a complete working system.
 - 3. Provide Stainless Steel assemblies at exterior locations and Galvanized Steel at interior applications.
 - 4. Include two (2) harnesses for two different weight classes; 100-200 lbs and 200-300 lbs.
 - 5. Manufacturers:
 - a. Honeywell Miller International Inc. ; Model VG: <http://sps.honeywell.com>.
 - b. Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.

- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Obtain approval prior to site cutting or making adjustments not scheduled.

3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

**SECTION 05 7000
DECORATIVE METAL**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Decorative metal units.

1.02 RELATED REQUIREMENTS

- A. Section 05 5000 - Metal Fabrications.

1.03 REFERENCE STANDARDS

- A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2013.
- B. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- C. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit manufacturer's product data, including description of materials, components, finishes, fabrication details, anchors, and accessories.
- C. Shop Drawings: Indicate elevations and sections, details of profile, dimensions, sizes, connection attachments, anchorage, size and type of fasteners, and accessories. Indicate anchor and joint locations, brazed connections, transitions, and terminations.
- D. Manufacturer's Instructions: Indicate installation.
- E. Installer's qualification statement.
- F. Maintenance Data: Manufacturer's instructions for care and cleaning.
- G. Executed warranty.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than three years of documented experience.
- B. Installer Qualifications:
 - 1. Installer specialized in work of type specified with at least three years of documented experience and approved by manufacturer.
- C. Templates: Supply installation templates, reinforcing, and required anchorage devices.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in factory-provided protective coverings and packaging.
- B. Protect materials against damage during transit, delivery, storage, and installation at site.
- C. Inspect materials for damage upon delivery. Replace damaged and unrepairable materials. Ensure replacement materials are indistinguishable from undamaged parts and finishes.
- D. Prior to installation, store materials and components under cover in a dry location.

1.07 FIELD CONDITIONS

- A. Maintain ambient temperature of space at minimum 65 degrees F and maximum 95 degrees F for 24 hours before, during, and after installation.

1.08 WARRANTY

- A. Manufacturer Warranty: Provide 2-year manufacturer warranty for defects in materials, fabrication, finishes, and installation. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 DECORATIVE METAL UNITS

- A. Decorative Exterior Metal Panels:
 - 1. Base Metal: 3/16" thick aluminum: Type 5052 alloy complying with ASTM B209.
 - 2. Profile: Custom profile, As indicated on drawings.
 - 3. Location: As indicated on drawings.
 - 4. Panel Size: 4'x8' Standard Size
 - 5. Finish: Fluoropolymer Coating PVDF 70% Kynar, Gloss Finish
 - 6. Color: Select from Manufacturer's full line of standard colors.

2.02 MATERIALS

- A. General: Provide sheet metal without pitting, seam marks, roller marks, stains, discolorations, or other imperfections exposed to view on finished units.
- B. Aluminum Components: ASTM B221 or ASTM B221M.
 - 1. Sheet Aluminum: ASTM B209/B209M, 5052 alloy, H32 or H22 temper.

2.03 FABRICATION

- A. Fit and shop assemble items in largest practical sections for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- D. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.04 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation from Plane: 1/16 inch in 48 inches.

2.05 FINISHES

- A. General: Comply with NAAMM AMP 500-06.
 - 1. Complete mechanical finishes before fabrication. After fabrication, finish joints, bends, abrasions, and surface blemishes to match sheet.
 - 2. Protect mechanical finishes on exposed surfaces from damage.
 - 3. Apply organic and anodic finishes to formed metal after fabrication unless otherwise indicated.
 - 4. Appearance: Limit variations in appearance of adjacent pieces to one-half of range represented in approved samples. Noticeable variations in same piece are not acceptable. Install components within range of approved samples to minimize contrast.
- B. Aluminum Finishes:
 - 1. High Performance Organic Coatings: AAMA 2604; multiple coats, thermally cured fluoropolymer system.
 - 2. Color: As selected by Architect from manufacturer's standard range.
 - 3. Touch-Up Materials: As recommended by coating manufacturer for field application.

2.06 ACCESSORIES

- A. Anchors and Fasteners: Provide anchors, fasteners, and other attachment devices required to attach to structure. Ensure attachment devices are of same material as components unless indicated otherwise.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate and site conditions are acceptable and ready to receive work.
- B. Verify field dimensions of locations and areas to receive work.
- C. Notify Architect immediately of conditions that would prevent satisfactory installation.
- D. Do not proceed with work until detrimental conditions have been corrected.

3.02 PREPARATION

- A. Protect existing work.
- B. Clean surfaces to receive units. Remove materials and substances detrimental to installation.

3.03 INSTALLATION

- A. Comply with manufacturer's drawings and written instructions.
- B. Install components plumb and level, accurately fitted, free from distortion or defects, and with tight joints, except where necessary for expansion.
- C. Anchor securely to structure.
- D. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.
- E. Isolate dissimilar materials with bituminous coating, bushings, grommets, or washers to prevent electrolytic corrosion.

3.04 CLEANING

- A. Remove protective film from exposed metal surfaces.
- B. Metal: Clean exposed metal finishes with potable water and mild detergent, in accordance with manufacturer recommendations; do not use abrasive materials or chemicals, detergents, or other substances that may damage the material or finish.

3.05 PROTECTION

- A. Protect installed components and finishes from damage after installation.
- B. Repair damage to exposed finishes to be indistinguishable from undamaged areas.
- C. If damage to finishes and components cannot be repaired to be indistinguishable from undamaged finishes and components, replace damaged items.

END OF SECTION

**SECTION 06 1000
ROUGH CARPENTRY**

PART 1 GENERAL V.22

1.01 SECTION INCLUDES

- A. Roof-mounted curbs.
- B. Roofing nailers.
- C. Preservative treated wood materials.
- D. Fire retardant treated wood materials.
- E. Communications and electrical room mounting boards.
- F. Concealed wood blocking, nailers, and supports.
- G. Wall sheathing with factory applied water-resistive and air barrier sheet.

1.02 REFERENCE STANDARDS

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- C. ASTM E2357 - Standard Test Method for Determining Air Leakage of Air Barrier Assemblies; 2011.
- D. AWPA U1 - Use Category System: User Specification for Treated Wood; 2012.
- E. PS 1 - Structural Plywood; 2009.
- F. PS 20 - American Softwood Lumber Standard; 2010.
- G. SPIB (GR) - Grading Rules; 2014.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide technical data on structural lumber, sheathing, fire treated and wood preservative materials and application instructions.
- C. Installation fastener requirements and spacing.
- D. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.
- B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
 - 1. Species: Southern Pine, unless otherwise indicated.
 - 2. 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.
 - 3. 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.

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. Stud Framing (2 by 2 through 2 by 6):
 - 1. Species: Douglas Fir-Larch.
 - 2. Grade: No. 2.
- E. Joist, Rafter, and Small Beam Framing (2 by 6 through 4 by 16):
 - 1. Grade: [CHOICE TEXT].
- F. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
 - 1. Lumber: S4S, No. 2 or Standard Grade.
 - 2. Boards: Standard or No. 3.

2.03 CONSTRUCTION PANELS

- A. Wall Sheathing (with factory applied Weather Barrier) : Engineered wood sheathing with integral weather resistive barrier, ASTM C1177/C1177M, 5/8 inch thick.
 - 1. Edges: Square along 4 foot edges, tongue-and-tongue along long edges.
 - 2. Water Vapor Permeance: 12 perms, minimum, when tested in accordance with ASTM E96/E96M.
 - 3. Air Permeance, Assembly: 0.04 cfm per square foot, maximum, when tested in accordance with ASTM E2357.
 - 4. Weather Barrier Facer: Medium-density, phenolic-impregnated sheet material qualifying as an ASTM D779 Grade D weather-resistive barrier in accordance with ICC-ES AC38 - Water-Resistive Barriers.
 - 5. Warranty:
 - a. Manufacturer's Warranty: Manufacturer's standard form in which sheathing manufacturer agrees to repair or replace sheathing products that demonstrate deterioration or failure under normal use due to manufacturing defects within warranty period specified, when installed according to manufacturer's ; 30 years, against exposure damage, and dated from date of Substantial Completion.
 - 6. Manufacturers:
 - a. Huber Engineered Woods LLC, Charlotte NC; Phone: (800) 933-9220; Website: www.huberwood.com
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- 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. Other Applications:
 - 1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
 - 2. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
 - 3. Other Locations: PS 1, C-D Plugged or better.

2.04 ACCESSORIES

- A. Fasteners and Anchors: Use fasteners suitable for proper attachment to substrates and contain weatherized coating approved for use where exposed. Fasteners in treated lumber are required to have high corrosion resistance, compatible with chemical treatment and be approved for use by wood manufacturer.
 - 1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.

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ROUGH CARPENTRY
DESIGN DEVELOPMENT

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2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
- B. Sill Flashing: As specified in Section 07 6200.
 - C. Water-Resistive Barrier: For other locations, as specified in Section 07 2500.
 - D. Fluid Applied Weather Barrier Joint Treatment: Dens Defy Liquid Flashing.
 - E. Joint Transition Membrane: Dens Defy Transition Membrane.

2.05 FACTORY WOOD TREATMENT

- A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
 1. Fire-Retardant Treated Wood (FRTW) : Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
 2. Preservative-Treated Wood (PTW): 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. Fire Retardant Treatment:
 1. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
 - a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
 - b. Treat rough carpentry items as indicated .
 - c. Do not use fire treated wood in applications exposed to weather or where the wood may become wet.
- C. Preservative Treatment:
 1. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative.
 - a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
 - b. Treat lumber in contact with roofing, flashing, or waterproofing.
 - c. Treat lumber in contact with masonry or concrete.

PART 3 EXECUTION

3.01 PREPARATION

- A. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL

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

3.03 BLOCKING, NAILERS, AND SUPPORTS

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
- B. At building construction types I & type II, refer to code review statements on drawings, use fire-retardant treated wood FRTW where drawings indicate the use of wood for blocking, nailers or furring at the following locations:
 1. Exterior walls that are classified with fire resistance rating.

- 2. Interior fire resistance rated partitions.
- C. At exterior walls, use pressure treated wood PTW for blocking.
- D. At interior locations, blocking shall be standard wood unless noted otherwise.
- E. 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.
- F. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
- G. 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. Wall paneling and trim.
 - 9. Joints of rigid wall coverings that occur between studs.
 - 10. Locations of termination bars for elements such as masonry flashing or roofing, etc..
Continuous plywood strips are permitted at exterior walls, in same thickness of wall sheathing, provided the exterior surface is field treated with fluid weather barrier product.

3.04 ROOF-RELATED CARPENTRY

- A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

3.05 INSTALLATION OF CONSTRUCTION PANELS

- A. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.
 - 1. Use fastener type and spacing as recommended by manufacturer to accommodate no less than structural design wind speed per structural plans.
- B. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
 - 1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
 - 2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
- C. Wall Sheathing and Roof Sheathing with Laminated Water-Resistive Barrier and Air Barrier: Secure to studs as recommended by manufacturer.
 - 1. Install with laminated water-resistive and air barrier on exterior side of sheathing.
 - 2. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
 - 3. Use compatible fluid applied weather barrier at transitions to adjacent materials.
 - 4. Apply manufacturer's standard seam tape to joints between sheathing panels. Use tape gun or hard rubber roller as recommended by manufacturer.
 - 5. Treatment of openings, penetrations, patches and repairs are per section 07 2500 weather barriers.

3.06 TOLERANCES

- A. Framing Members: 1/4 inch from true position, maximum.

- B. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.07 CLEANING

- A. Waste Disposal: 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

**SECTION 06 4100
ARCHITECTURAL WOOD MILLWORK**

PART 1 GENERAL V.22

1.01 SECTION INCLUDES

- A. Custom made specially fabricated cabinet units and assemblies.
- B. Countertops.
- C. Hardware.
- D. Factory finishing.

1.02 REFERENCE STANDARDS

- A. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.0; 2016.
- B. BHMA A156.9 - American National Standard for Cabinet Hardware; 2010.
- C. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected installers.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
 - 1. Scale of Drawings: 1-1/2 inch to 1 foot, minimum.
 - 2. Provide the information required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
 - 3. Include certification program label.
- C. Product Data: Provide data for hardware accessories.
- D. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.
- E. Certificate: Submit labels and certificates required by quality assurance and quality control programs. Provide documentation that millwork meets or exceeds quality standard specified.

1.05 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
- B. Quality Certification:
 - 1. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

1.06 MOCK-UP

- A. Provide mock-up of typical base cabinet, wall cabinet, and countertop, including hardware, finishes, and plumbing accessories.
- B. Locate where directed.
- C. Mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protect units from moisture damage.

1.08 FIELD CONDITIONS

- A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Single Source Responsibility: Provide and install this work from single fabricator.

2.02 CABINETS

- A. Quality Standard: Premium Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
- B. Wood Veneer Faced Cabinet:
 - 1. Exposed Surfaces: Wood Grade AA, Maple, plain sliced, slip-matched, veneer stained / varnished.
 - 2. Semi-Exposed Surfaces: Wood Grade A, Maple, rotary cut, random-matched, veneer stained / varnished.
 - 3. Concealed Surfaces: Manufacturer's option.
- C. Plastic Laminate Faced Cabinets: Custom grade.
 - 1. Finish - Exposed Exterior Surfaces: HPL veneer.
 - 2. Finish - Exposed Interior Surfaces: HPL veneer.
 - 3. Finish - Semi-Exposed Interior Surfaces: TFL veneer, unless noted otherwise.
 - 4. Finish - Concealed Surfaces: Manufacturer's Standard.
- D. Cabinets:
 - 1. Door and Drawer Front Edge Profiles: Square edge with thin applied band.
 - 2. Casework Construction Type: Type A - Frameless.
 - 3. Cabinet Design: As indicated on drawings.
 - 4. Adjustable Shelf Loading: 50 lbs. per sq. ft.
 - 5. Cabinet Style: Flush overlay.
 - 6. Cabinet Doors and Drawer Fronts: Flush style.
 - 7. Drawer Construction Technique: Dovetail joints.

2.03 WOOD-BASED COMPONENTS

- A. Wood fabricated from old growth timber is not permitted.

2.04 PLASTIC LAMINATE MATERIALS

- A. Manufacturers:
 - 1. Formica Corporation: www.formica.com/#sle.
 - 2. Panolam Industries International, Inc; Nevamar Standard HPL: www.panolam.com/#sle.
 - 3. Wilsonart; www.wilsonart.com
 - 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Thermally Fused Laminate (TFL): Melamine resin, NEMA LD 3, Type VGL laminate panels.
 - 1. Manufacturers:
 - a. Wilsonart LLC: www.wilsonart.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- C. High Pressure Laminate (HPL): NEMA LD 3, types as recommended for specific applications.
- D. Provide specific types as indicated.
 - 1. Horizontal Surfaces: HGS, 0.048 inch nominal thickness, through color, color as selected, finish as indicated.
 - 2. Vertical Surfaces: VGS, 0.028 inch nominal thickness, through color, color as selected, finish as indicated.
 - 3. Cabinet Liner: CLS, 0.020 inch nominal thickness, through color, color as selected, finish as indicated.
 - 4. Laminate Backer: BKL, 0.020 inch nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure laminate.

2.05 COUNTERTOPS & SILL SURFACES

- A. Solid Surfacing; SSC-01: Solid surfacing material, homogeneous-filled plastic resin.
 - 1. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISSFA-2 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. Color and Pattern: Durat 630-00 and Durat M027-4.
 - b. Manufacturers:
 - 1) Durat, CaraGreen LLC; Basis of Design, Standard Collection: www.caragreen.com
 - 2) Corian Design, Dupont: www.corian.com
 - 3) Durasein Solid Surface: www.durasein.com
 - c. Location: Corridor sinks.
 - d. Sink: Intergrated sink. Coordinate with plumbing.
 - 1) Model: Block I-A
 - 2) Size: 15"x9"x5"
- B. Solid Surfacing; SSC-02: Solid surfacing material, homogeneous-filled plastic resin.
 - 1. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISSFA-2 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. Color and Pattern: Bianca Sabbia - DM5018
 - b. Manufacturers:
 - 1) Durasein Solid Surface, Basis of Design: www.durasein.com
 - 2) Corian Design, Dupont: www.corian.com
 - 3) Durat, CaraGreen LLC; Standard Collection: www.caragreen.com
 - c. Location: Lanes.
- C. Quartz Surfacing; QTZ-01: Quartz slabs bonded to substrate; use as large pieces as possible with inconspicuous adhesive joints.
 - 1. Product: Silestone. Uniform surface without cracks, void or pin holes.
 - 2. Color: To Be Determined.
 - 3. Stone Thickness: 3/4 inch (2cm) minimum.
 - 4. Surface Finish: Polished
 - 5. Exposed Edge Treatment: Square profile stone, 1 inch thick with 1/8 inch radius corner.
 - 6. Back and End Splashes: Same material; 3/4 inch (2cm) thickness; for field attachment.
 - 7. Fabricate in accordance with AWI/AWMAC/WI (AWS) Standards, Section 11- Premium Grade.
 - 8. Location: Breakroom, Reception Desk, Restrooms.

2.06 ACCESSORIES

- A. Adhesive: Type recommended by fabricator to suit application.
- B. Fasteners: Size and type to suit application.
- C. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.
- D. Concealed Joint Fasteners: Threaded steel.
- E. Grommets: Standard plastic, painted metal, or rubber grommets for cut-outs, in color to match adjacent surface.

2.07 HARDWARE

- A. Hardware: BHMA A156.9, types as recommended by fabricator for quality grade specified.

- B. Shelf standards and Rests: Injection molded transparent polycarbonate friction fit into cabinet end panels and vertical dividers, adjustable on 32mm centers. Each shelf support has 2 integral support pins, 5mm diameter, to interface pre-drilled holes and to prevent accidental rotation of support. The support automatically adapts to 19mm (3/4") or 25mm (1") thick shelving and provides a non-tip feature for shelving. Supports may be field fixed if desired. Structural load to 1200 pounds (300 pound per support) without failure.
- C. Adjustable Shelf Supports: Standard side-mounted system using multiple holes for pin supports and coordinated self rests, polished chrome or satin chrome finish, for nominal 1 inch spacing adjustments.
- D. Drawer and Door Pulls: "U" shaped wire pull, steel with chrome finish, 4 inch centers.
- E. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with chrome finish.
- F. Drawer Slides:
 - 1. Type: Full extension.
 - 2. Static Load Capacity: Commercial grade.
 - 3. Mounting: Side mounted.
 - 4. Stops: Integral type.
 - 5. Features: Provide self closing/stay closed and soft close type.
 - 6. Manufacturers:
 - a. Accuride International, Inc; Light-Duty Drawer Slides: www accuride.com/#sle.
 - b. Grass America Inc; Ball Bearing Slide System: www grassusa.com/#sle.
 - c. Knappe & Vogt Manufacturing Company; Medium-Duty Drawer Slides: www knapeandvogt.com/#sle.
- G. Hinges: European style concealed self-closing type, steel with polished finish.
 - 1. Manufacturers:
 - a. Grass America Inc; Tiomos Hinge System: www grassusa.com/#sle.
 - b. Blum, Inc: www blum.com/#sle.

2.08 FABRICATION

- A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
- B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.
- C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.
- D. Solid Surfacing: Fabricate tops up to 144 inches long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.
- E. Matching Wood Grain: Comply with requirements of quality standard for specified Grade and as follows:
 - 1. Provide center matched panels at each elevation.
 - 2. Provide sequence matching across each elevation.
 - 3. Carry figure of cabinet fronts to toe kicks.
- F. Mechanically fasten back splash to countertops with steel brackets at 16 inches on center.

2.09 SHOP FINISHING

- A. Sand work smooth and set exposed nails and screws.
- B. On items to receive transparent finishes, use wood filler matching or blending with surrounding surfaces and of types recommended for applied finishes.
- C. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
 - 1. Transparent:

- a. System - 11, Polyurethane, Catalyzed.
- b. Stain: As selected by Architect.
- c. Sheen: Satin.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify adequacy of backing and support framing.
- B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION

- A. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
- B. Use fixture attachments in concealed locations for wall mounted components.
- C. Use concealed joint fasteners to align and secure adjoining cabinet units.
- D. Carefully scribe millwork abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
- E. Secure cabinets to floor using appropriate angles and anchorages.
- F. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

3.03 ADJUSTING

- A. Adjust installed work.
- B. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING

- A. Clean millwork, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION

**SECTION 07 1113
BITUMINOUS DAMPPROOFING**

PART 1 GENERAL V.22

1.01 SECTION INCLUDES

- A. Bituminous dampproofing system applied to backside of exterior CMU retaining walls.
- B. Protection boards.
- C. Drainage panels with filter fabric.

1.02 REFERENCE STANDARDS

- A. ASTM D1187/D1187M - Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal; 1997 (Reapproved 2011).
- B. ASTM D1227 - Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing; 2013.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide properties of primer, bitumen, and mastics.
- C. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing the work of this section with at least three years of documented experience.

1.05 FIELD CONDITIONS

- A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application until dampproofing has cured.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Bituminous Dampproofing Manufacturers:
 - 1. Karnak Corporation: www.karnakcorp.com.
 - 2. Mar-Flex Systems, Inc: www.mar-flex.com/sle.
 - 3. W. R. Meadows, Inc: www.wrmeadows.com/sle.
 - 4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 BITUMINOUS DAMPPROOFING

- A. Bituminous Dampproofing: Cold-applied water-based emulsion; asphalt with mineral colloid or chemical emulsifying agent; with or without fiber reinforcement; asbestos-free; suitable for application on vertical and horizontal surfaces.
 - 1. Composition - Vertical Application: ASTM D1227 Type III or ASTM D1187/D1187M Type I.
 - 2. Composition - Horizontal and Low-Slope Application: ASTM D1227 Type II or III.
 - 3. VOC Content: Not more than permitted by local, State, and federal regulations.
 - 4. Applied Thickness: 1/16 inch, minimum, wet film.
- B. Primers, Mastics, and Related Materials: Type as recommended by dampproofing manufacturer.

2.03 ACCESSORIES

- A. Drainage Panel: 1/4 inch thick formed plastic, hollowed sandwich with filter fabric.
- B. Protection Board: 1/8 inch thick biodegradable hardboard.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions are acceptable prior to starting this work.
- B. Verify substrate surfaces are durable, free of matter detrimental to adhesion or application of dampproofing system.
- C. Verify that items penetrating surfaces to receive dampproofing are securely installed.

3.02 PREPARATION

- A. Protect adjacent surfaces not designated to receive dampproofing.
- B. Clean and prepare surfaces to receive dampproofing in accordance with manufacturer's instructions.
- C. Do not apply dampproofing to surfaces unacceptable to manufacturer.
- D. Apply mastic to seal penetrations, small cracks, or minor honeycombs in substrate.

3.03 APPLICATION

- A. Foundation Walls: Apply two coats of asphalt dampproofing.
- B. Apply bitumen with mop.
- C. Apply from 2 inches below finish grade elevation down to top of footings.
- D. Seal items watertight with mastic, that project through dampproofing surface.
- E. Place drainage panel directly over dampproofing, butt joints, place to encourage drainage downward.
- F. Place protection board directly over dampproofing, butt joints, and adhere to tacky dampproofing.
- G. Scribe and cut boards around projections, penetrations, and interruptions.

END OF SECTION

**SECTION 07 2100
THERMAL INSULATION**

PART 1 GENERAL V.22

1.01 SECTION INCLUDES

- A. Board insulation at cavity wall construction, perimeter foundation wall, underside of floor slabs, and exterior wall behind masonry or siding wall finish.
- B. Batt insulation in exterior and interior wall, ceiling, and roof construction.
- C. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

1.02 REFERENCE STANDARDS

- A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2009a.
- B. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2010.
- C. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2013.
- D. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2015a.
- E. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2014.
- F. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.
- G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- H. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 2012.
- I. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials; National Fire Protection Association; 2006.
- J. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components; 2012.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
- C. Installation schedule: Provide description of locations where each proposed product will be installed. Include description of compliance with fire rated, acoustical and NFPA 285 details.
- D. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.04 FIELD CONDITIONS

- A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 APPLICATION SCHEDULE

- A. Insulation Under Concrete Slabs: Extruded polystyrene (XPS) board.
- B. Insulation at Perimeter of Foundations, below grade: Extruded polystyrene (XPS) board.

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- C. Insulation at Perimeter of Foundations, above grade: Mineral Wool Board.
- D. Insulation as Protection Board at Foundations, below grade only: Extruded polystyrene (XPS) board.
- E. Insulation Inside Cavity of Masonry Veneer Walls, below grade only: Extruded polystyrene (XPS) board.
- F. Insulation on exterior face of sheathing: Mineral Wool board.
- G. Insulation behind exterior Metal Wall Panels: Mineral Wool board.
- H. Insulation inside STC and Fire Rated partitions: SAFB Mineral Wool Insulation, no vapor retarder.
- I. Insulation inside exterior metal framing walls: Batt insulation with no vapor retarder
- J. Insulation inside metal framed partitions: Batt insulation with no vapor retarder.
- K. Insulation inside Wood Framed Walls: Batt insulation with no vapor retarder.
- L. Insulation in Framed Ceiling Structure: Batt insulation with separate vapor retarder.
- M. Insulation Above Lay-In Acoustical Ceilings: Batt insulation with no vapor retarder.

2.02 BOARD INSULATION MATERIALS

- A. Extruded Polystyrene Board Insulation (**XPS**): ASTM C578, Type IV; Extruded polystyrene board with either natural skin or cut cell surfaces; with the following characteristics:
 1. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
 2. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
 3. Board Size: 48 x 96 inch.
 4. Board Thickness: 1-1/2 inches, or unless indicated otherwise.
 5. Board Edges: Shiplap.
 6. Thermal Conductivity (k factor) at 25 degrees F: 0.18 (R= 5 minimum per inch).
 7. Compressive Resistance: 25 psi.
 8. Manufacturers:
 - a. Dow Chemical Company: www.dow.com/#sle.
 - b. Kingspan Insulation LLC; GreenGuard XPS Type IV, 25 psi: www.kingspan.com/#sle.
 - c. Owens Corning Corporation; FOAMULAR Extruded Polystyrene (XPS) Insulation: www.ocbuildingspec.com/#sle.
 - d. Substitutions: See Section 01 6000 - Product Requirements.
- B. Mineral Wool Board Insulation: Rigid or semi-rigid stone wool insulation, ASTM C612 or ASTM C553; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.
 1. Combustibility: Behavior of material at 750 degrees as non-combustible per ASTM E136.
 2. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.
 3. Board Size: 16 by 48 inches standard, size varies by manufacturer,.
 4. Board Thickness: 2 inches and/or as indicated on drawings.
 5. Thermal Resistance: R-value of 4.3 per inch at 75 degrees F, minimum, when tested according to ASTM C518.
 6. Minimum Density: 4.3 pound per cubic foot, nominal.
 7. Manufacturers:
 - a. Johns Manville;CladStone 45 ____: www.jm.com/#sle.
 - b. ROCKWOOL (ROXUL, Inc); CAVITYROCK: www.rockwool.com/#sle.
 - c. Thermafiber, Inc;RainBarrier ic HC 80 ____: www.thermafiber.com/#sle.
 8. Substitutions: See Section 01 6000 - Product Requirements.

2.03 BATT INSULATION MATERIALS

- A. Where batt insulation is indicated, either glass fiber or SAFB mineral wool insulation may be used, at Contractor's option, unless specifically noted or required otherwise.
 - 1. Use Sound Attenuation Fire Blanket (SAFB) Mineral Wool at all fire rated assemblies and STC rated wall per drawings and partition schedule and as required by code/UL test.
- B. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
 - 1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
 - 2. Smoke Developed Index: 50 or less, when tested in accordance with ASTM E84.
 - 3. Combustibility: Non-combustible, when tested in accordance with ASTM E136.
 - 4. Formaldehyde Content: Zero.
 - 5. Thermal Resistance: R-value of 3.5 per inch minimum.
 - 6. Thickness: Match cavity thickness or as indicated on drawings or insulation schedule.
 - 7. Facing: Unfaced.
 - 8. Manufacturers:
 - a. CertainTeed Corporation: www.certainteed.com/#sle.
 - b. Johns Manville: www.jm.com/#sle.
 - c. Knauf Insulation GmbH: www.knaufinsulation.us.
 - d. Owens Corning Corp: www.owenscorning.com.
 - 9. Substitutions: See Section 01 6000 - Product Requirements.
- C. Sound Attenuation Fire Blanket (SAFB) Mineral Wool: Flexible or semi-rigid preformed batt or blanket, complying with ASTM C665; friction fit; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.
 - 1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
 - 2. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.
 - 3. Thermal Resistance: R-value of 3.5 per inch, minimum.
 - 4. Thickness: Match cavity thickness, indicated on drawings or per insulation schedule.
 - 5. Manufacturers:
 - a. Knauf Insulation; EcoBatt Insulation: www.knaufinsulation.com/#sle.
 - b. Thermafiber, Inc; SAFB: www.thermafiber.com/#sle.
 - c. Substitutions: See Section 01 6000 - Product Requirements.

2.04 ACCESSORIES

- A. Tape: Bright aluminum self-adhering type, mesh reinforced, 2 inch wide.
- B. Insulation Fasteners: Impaling clip of unfinished steel with washer retainer and clips, to be adhered to surface to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.
- C. Wire Mesh: Galvanized steel, hexagonal wire mesh.
- D. Protection Board for Below Grade Insulation: XPS, 2 inch thick.
- E. Adhesive: Type recommended by insulation manufacturer for application.
- F. Spray-foam Insulation: See also Section 07 2119.
 - 1. Polyurethane expanding foam.
 - 2. Products: DuPont Great Stuff; www.greatstuff.dupont.com
 - 3. Dupont Great Stuff

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
- B. Verify substrate surfaces are flat.

3.02 BOARD INSTALLATION AT FOUNDATION PERIMETER

- A. Adhere a 6 inch wide strip of polyethylene sheet over construction, control, and expansion joints with double beads of adhesive each side of joint.
 - 1. Tape seal joints.
 - 2. Extend sheet full height of joint.
- B. Apply adhesive to back of boards:
 - 1. Three continuous beads per board length.
 - 2. Full bed 1/8 inch thick.
- C. Install boards horizontally on foundation perimeter.
 - 1. Place boards to maximize adhesive contact.
 - 2. Install in running bond pattern.
 - 3. Butt edges and ends tightly to adjacent boards and to protrusions.
- D. Extend boards over expansion joints, unbonded to foundation on one side of joint.
- E. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
- F. Immediately following application of board insulation, place protective boards over exposed insulation surfaces.
 - 1. Apply adhesive in five continuous beads per board length.
 - 2. Install boards horizontally from base of foundation to top of insulation.
 - 3. Butt boards tightly, with joints staggered from insulation joints.

3.03 BOARD INSTALLATION AT EXTERIOR WALLS

- A. Adhere a 6 inch wide strip of polyethylene sheet over building expansion joints with double beads of adhesive each side of joint.
 - 1. Tape seal joints between sheets.
 - 2. Extend sheet full height of joint.
- B. Mechanically fasten insulation boards to sheathing with rust resistant screws and 2" diameter rigid plastic washers to allow secure attachment.
 - 1. Install 24 inches each way or as prescribed by insulation manufacturer.
- C. Install boards horizontally on walls.
 - 1. Install in running bond pattern.
 - 2. Butt edges and ends tightly to adjacent boards and protrusions.
- D. Extend boards over expansion joints, unbonded to wall on one side of joint.
- E. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
- F. Fill voids in walls and cavities around perimeter of openings with spray-foam insulation.

3.04 BOARD INSTALLATION AT CAVITY WALLS

- A. Secure impale fasteners to substrate at following frequency:
 - 1. Six (6) per insulation board.
- B. Adhere a 6 inches wide strip of polyethylene sheet over expansion joints with double beads of adhesive each side of joint.
 - 1. Tape seal joints between sheets.
 - 2. Extend sheet full height of joint.
- C. Install boards to fit snugly between wall ties.
- D. Install boards horizontally on walls.
 - 1. Install in running bond pattern.
 - 2. Butt edges and ends tightly to adjacent boards and protrusions.
 - 3. Place impale fastener locking discs.
- E. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
- F. Fill voids in walls and cavities around perimeter of openings with spray-foam insulation.

3.05 BOARD INSTALLATION UNDER CONCRETE SLABS

- A. Place insulation under slabs on grade after base for slab has been compacted.
- B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
- C. Prevent insulation from being displaced or damaged while placing vapor retarder and placing slab.
- D. Install spray-foam insulation around gaps and voids in penetrations through board insulation.

3.06 BOARD INSTALLATION OVER STEEP SLOPE ROOF SHEATHING OR ROOF STRUCTURE

- A. Installation of board insulation over steep slope roof structure or roof sheathing is specified in Section 06 1000.

3.07 BATT INSTALLATION

- A. Install insulation and vapor retarder in accordance with manufacturer's instructions.
- B. Install in interior sound attenuated and exterior wall and roof spaces without gaps or voids. Do not compress insulation.
- C. Trim insulation neatly to fit spaces. Cut and form insulation as necessary to fully fill all cavities and void spaces. Insulate miscellaneous gaps and voids.
- D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
- E. At attic locations with gyp-bd ceilings, use spray foam around all penetrations through gyp-bd layer. Apply to seal all air leakage around penetrations and to insulate around device. Fill voids around plumbing pipes, conduits, wiring, junction boxes, etc poking through attic ceiling layer.
- F. Install insulation in thicknesses required to achieve minimum desired R-values below; unless noted otherwise.
 - 1. Walls: R-19
 - 2. Floors: R-13
 - 3. Floors above unconditioned spaces: R-19
 - 4. Ceilings at unconditioned attic spaces: R-29
- G. Fill voids in walls and cavities around perimeter of openings with spray-foam insulation. Fill shim spaces around window perimeters full with batt insulation or low-expansion spray-foam insulation.

3.08 PROTECTION

- A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

**SECTION 07 2119
FOAMED-IN-PLACE INSULATION**

PART 1 GENERAL V.22

1.01 SECTION INCLUDES

- A. Foamed-in-place insulation installed as part of the exterior building thermal envelope.
- B. At junctions of dissimilar wall and roof materials.
- C. Protective intumescent coating.

1.02 REFERENCE STANDARDS

- A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2010.
- B. ASTM D1622/D1622M - Standard Test Method for Apparent Density of Rigid Cellular Plastics; 2014.
- C. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics; 2012.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- E. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2014.
- F. ASTM E2178 - Standard Test Method for Air Permeance of Building Materials; 2013.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week prior to commencing work of this section.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide product description, insulation properties, overcoat properties, and preparation requirements and shop drawings identifying locations being applied.
- C. Manufacturer's Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.
- D. Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than three years of documented experience.
- B. Field Density testing: Take field samples daily and provide report on density of samples.

1.06 REGULATORY REQUIREMENTS

- A. Conform to applicable code for flame and smoke limitations.

1.07 MOCK-UP

- A. Locate where directed.
- B. Mock-up may remain as part of the Work.

1.08 FIELD CONDITIONS

- A. Do not apply foam when temperature is below that specified by the manufacturer for ambient air and substrate.
- B. Do not apply foam when temperature is within 5 degrees F of dew point.

PART 2 PRODUCTS

MANUFACTURERS

2.01 FOAMED-IN-PLACE INSULATION:

- A. BASF Corporation; WALLTITE US Series Closed Cell: www.spf.basf.com/#sle.
- B. Icynene-Lapolla; Icynene ProSeal (MD-C-200 v3): www.icynene.com/#sle.
- C. Johns Manville; JM Corbond III Closed Cell Spray Polyurethane Foam: www.jm.com/#sle.
- D. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

- A. Foamed-In-Place Insulation: Medium-density, rigid or semi-rigid, closed cell polyurethane foam; foamed on-site, using blowing agent of water or non-ozone-depleting gas.
 - 1. Thermal Resistance: R-value of 5.0, minimum, per 1 inch thickness at 75 degrees F mean temperature when tested in accordance with ASTM C518.
 - 2. Water Vapor Permeance: Vapor retarder; 2 perms, maximum, when tested at intended thickness in accordance with ASTM E96/E96M, desiccant method.
 - 3. Water Absorption: Less than 1 percent by volume, maximum, when tested in accordance with ASTM D2842.
 - 4. Air Permeance: 0.04 cfm per square foot, maximum, when tested at intended thickness in accordance with ASTM E2178 at 1.57 psf.
 - 5. Closed Cell Content: At least 90 percent.
 - 6. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.
 - 7. Density: 2.0 lbs/cuft, nominal, in accordance with ASTM D1622/D1622M.

2.03 ACCESSORIES

- A. Primer: As required by insulation manufacturer.
- B. Overcoat: Intumescent coating of type recommended by insulation manufacturer and as required to comply with applicable codes.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify work within construction spaces or crevices is complete prior to insulation application.
- B. Verify that surfaces are clean, dry, and free of matter that may inhibit insulation or overcoat adhesion.

3.02 PREPARATION

- A. Mask and protect adjacent surfaces from over spray or dusting.
- B. Apply primer in accordance with manufacturer's instructions.

3.03 APPLICATION

- A. Apply insulation in accordance with manufacturer's instructions.
- B. Apply insulation by spray method, to a uniform monolithic density without voids.
- C. Apply to achieve a thermal resistance R-value of 20.
- D. Patch damaged areas.
- E. Where applied to voids and gaps assure space for expansion to avoid pressure on adjacent materials that may bind operable parts.
- F. Trim excess away for applied trim or remove as required for continuous sealant bead.
- G. Apply insulation inside of building at all transitions from wall to roof, at underside of all roof ridges, hips and valleys, all penetrations through roofs, and as otherwise indicated at drawings.

- H. Apply overcoat to surface at locations where it is not concealed behind 1/2" thick gypsum board. Overcoat to be equivalent to a 15 minute thermal barrier as required by IBC.

3.04 FIELD QUALITY CONTROL

- A. Inspection will include verification of insulation and overcoat thickness and density. Installer to take daily tests and maintain a log of tests and areas performed.

3.05 PROTECTION

- A. Do not permit subsequent construction work to disturb applied insulation.

END OF SECTION

SECTION 07 2500 WEATHER BARRIERS

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

- A. Weather Barrier Assemblies: Under exterior wall cladding, integral with sheathing or applied to substrate; that resists the transmission of air and is moisture permeable.
- B. Transition Membrane: Membrane products that span joints between different types of substrates to provide continuity
- C. Air Barriers: Materials that form a system to stop passage of air through exterior walls, joints between exterior walls and roof, and joints around frames of openings in exterior walls.
- D. Flashing: Materials that form a system to move liquid water to the outside of the exterior walls typically occurring at wall transitions and openings.

1.02 REFERENCE STANDARDS

- A. AATCC Test Method 127 - Water Resistance: Hydrostatic Pressure Test; 2014.
- B. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2006a (Reapproved 2013).
- C. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2013.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- E. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2014.
- F. ASTM E2178 - Standard Test Method for Air Permeance of Building Materials; 2013.
- G. ICC-ES AC212 - Acceptance Criteria for Water-Resistive Coatings Used as Water-Resistive Barriers over Exterior Sheathing; ICC Evaluation Service, Inc.; 2015.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on material characteristics, performance criteria, and limitations.
- C. Shop Drawings: Provide drawings of special joint conditions.

1.04 MOCK-UP

- A. Install weather barrier materials in mock-up.

1.05 FIELD CONDITIONS

- A. Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.

PART 2 PRODUCTS

2.01 WEATHER BARRIER ASSEMBLIES

- A. Air Barrier:
 - 1. At concrete walls: On the outside surface of the concrete use air barrier coating.
 - 2. At Masonry wall construction: On outside surface of inside wythe of exterior masonry cavity walls use air barrier coating.
 - 3. At framed walls with Masonry Veneer: Use wall sheathing with integral weather barrier as specified in section 06 1000 Rough Carpentry. Joint and perimeter treatments per 07 2500 Weather Barriers.
 - 4. At framed walls with Metal Wall Panels: Use wall sheathing with integral weather barrier as specified in section 06 1000 Rough Carpentry. Joint and perimeter treatment per 07 2500 Weather Barriers.

- B. Vapor Retarder:
 - 1. At underside of slab on grade concrete floors use vapor retarder sheet. Reference specification 03 3000.

2.02 AIR BARRIER MATERIALS (WATER VAPOR PERMEABLE AND WATER-RESISTIVE)

- A. Air Barrier (Weather Barrier) Coating:
 - 1. Material: Water-based acrylic or polymer-modified bitumen.
 - 2. Dry Film Thickness: 20 mils (0.020 inch), minimum. Verify with manufacturer.
 - 3. Air Permeance: 0.004 cubic feet per minute per square foot, maximum, when tested in accordance with ASTM E2178.
 - 4. Water Vapor Permeance: 12 perms, minimum, when tested in accordance with ASTM E96/E96M, Procedure B.
 - 5. Ultraviolet and Weathering Resistance: Approved in writing by manufacturer for up to 4 months of weather exposure after application.
 - 6. Elongation: 300 percent, minimum, when tested in accordance with ASTM D412.
 - 7. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
 - 8. Nail Sealability: Pass, when tested in accordance with ASTM D1970/D1970M.
 - 9. VOC Content: 25 g per L or less.
 - 10. Code Acceptance: Comply with applicable requirements of ICC-ES AC212.
 - 11. Manufacturers:
 - a. BASF Corporation; ENERSHIELD-HP: www.master-builders-solutions.basf.us/#sle.
 - b. Carlisle Coatings and Waterproofing, Inc.; Barritech-VP: www.carlisle-ccw.com.
 - c. DuPont Building Innovations; Tyvek Fluid Applied WB, Fluid Applied Flashing - Brush Formulation, Fluid Applied Flashing & Joint Compound, and Sealant for Fluid Applied System: www.dupont.com.
 - d. Parex USA, Inc; Parex USA WeatherSeal Spray & Roll-on: www.parexusa.com/#sle.
 - e. PROSOCO, Inc; R-GUARD Spray Wrap MVP: www.prosoco.com/r-guard/#sle.
 - f. W.R. Meadows, Inc.; Air-Shield LMP: www.wrmeadows.com.
 - g. Tremco; ExoAir 230: www.tremcosealants.com.
 - h. Substitutions: See Section 01 6000 - Product Requirements.

2.03 VAPOR RETARDER MATERIALS (AIR BARRIER AND WATER-RESISTIVE)

- A. Vapor Retarder Sheet : See specification section 03 3000.

2.04 SEALANTS

- A. Butyl Sealant: as specified in Section 07 9200.
- B. Sealants: as specified in Section 07 9200.
- C. Polyurethane Sealant: as specified in Section 07 9200.
- D. Sealant Backers: As specified in Section 07 9200.
- E. Primers, Cleaners, and Other Sealant Materials: As recommended by sealant manufacturer, appropriate to application, and compatible with adjacent materials.

2.05 ACCESSORIES

- A. Sealants, Tapes, and Accessories for Sealing Weather Barrier and Sealing Weather Barrier to Adjacent Substrates: As specified or as recommended by weather barrier manufacturer.
- B. Flexible Flashing: Self-adhesive sheet flashing complying with ASTM D1970/D1970M, except slip resistance requirement is waived if not installed on a roof.
 - 1. Thickness: 40 mil, 0.040 inch, nominal.
 - 2. Manufacturers:
 - a. Carlisle Coatings and Waterproofing, Inc.; CCW-705 TFW: www.carlisle-ccw.com.
 - b. Intertape Polymer Group, Inc; NovaFlash SA Universal Self-Adhered Flashing (25 mil): www.itape.com.

- c. Substitutions: See Section 01 6000 - Product Requirements.
- C. Liquid-Applied Flashing Membrane: Gun-grade, cold-applied, silyl-terminated polymer (STP) liquid flashing membrane compatible with sheathing/weather barrier, self-adhering seam and flashing tape, and tested as part of an assembly meeting performance requirements.
 - 1. Basis of Design: Huber Engineered Woods; ZIP System Liquid Flash.
- D. Thinners and Cleaners: As recommended by material manufacturer.
- E. Self-Adhering Flexible Flashing Tape: Pressure-sensitive, self-adhering, cold-applied, seam tape consisting of polyolefin film with acrylic adhesive; tested as part of an assembly meeting performance requirements.
 - 1. Basis of Design: Huber Engineered Woods; ZIP System stretch tape.
- F. Dust resistant cap screws, length as necessary to penetrate sheathing with plastic screw caps that seal penetration air tight.
 - 1. Tyvek Wrap cap screws, by DuPont, with 2 inch diameter caps.
 - 2. Approved equal.
- G. Self-Adhering Seam and Flashing Tape: Pressure-sensitive, self-adhering, cold-applied, seam tape consisting of polyolefin film with acrylic adhesive, meeting ICC-ES AC 148 - Acceptance Criteria for Flexible Flashing Materials, and tested as part of an assembly meeting performance requirements.
 - 1. Basis of Design: Huber Engineered Woods: ZIP System flashing tape.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and conditions are ready to accept the work of this section.

3.02 PREPARATION

- A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.
- B. Clean and prime substrate surfaces to receive adhesives in accordance with manufacturer's instructions.

3.03 INSTALLATION

- A. Install materials in accordance with manufacturer's instructions. Coordinate installation with products installed in openings and penetrations.
- B. Air Barriers & Vapor Retarders: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.
- C. Fluid Coatings (Spray or Roll Applied):
 - 1. Prepare substrate in manner recommended by coating manufacturer; treat joints in substrate and between dissimilar materials as recommended by manufacturer.
 - 2. Where exterior masonry veneer is to be installed, install masonry anchors before installing weather barrier over masonry; seal around anchors air tight.
 - 3. Mastic Coating: Install by trowel or roller to minimum thickness of 1/4 inch; use sheet seal to join to adjacent construction, seal air tight with sealant.
 - 4. Use flashing to seal to adjacent construction and to bridge joints.
- D. Openings and Penetrations in Exterior Weather Barriers (including sheathing with integral weather barrier):
 - 1. Install flashing over sills, covering entire sill frame member, extending at least 5 inches onto weather barrier and at least 6 inches up jambs; mechanically fasten stretched edges.
 - 2. At openings to be filled with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with sealing tape at least 4 inches wide; do not seal sill flange. Install weather barrier into opening beyond the inside face of opening frame. Coordinate depth with opening unit.

3. At openings to be filled with non-flanged frames, seal weather barrier to each side of opening framing, using flashing at least 9 inches wide, covering entire depth of framing.
4. At head of openings, install flashing under weather barrier extending at least 2 inches beyond face of jambs; seal weather barrier to flashing.
5. At interior face of openings, seal gap between opening unit frame and rough framing, flashing around opening perimeter using joint sealant over backer rod and sealed directly to the weather barrier.
6. Service and Other Penetrations: Form flashing around penetrating item and seal to weather barrier surface.

3.04 FIELD QUALITY CONTROL

- A. Coordination of ABAA Tests and Inspections:
 1. Provide testing and inspection required by ABAA QAP.
 2. Notify ABAA in writing of schedule for air barrier work, and allow adequate time for testing and inspection.
 3. Cooperate with ABAA testing agency.
 4. Allow access to air barrier work areas and staging.
 5. Do not cover air barrier work until tested, inspected, and accepted.
- B. Do not cover installed weather barriers until required inspections have been completed.
- C. Take digital photographs of each portion of the installation prior to covering up.
 1. Photograph each penetration through weather barrier prior to concealing from view.

3.05 PROTECTION

- A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION

**SECTION 07 4213
METAL WALL PANELS**

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

- A. Manufactured metal panels for exterior wall panels and subgirt framing assembly, with insulation, related flashings, and accessory components.

1.02 REFERENCE STANDARDS

- A. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2010, with 2013 Supplements and Errata.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- C. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- D. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate dimensions, layout, joints, construction details, and methods of anchorage.
- C. Samples: Submit two samples of wall panel and soffit panel, 12 inch by 12 inch in size illustrating finish color, sheen, and texture.
- D. Manufacturer's Qualification Statement.
- E. Installer's Qualification Statement.
- F. Test Reports showing compliance for reference standards.

1.04 QUALITY ASSURANCE

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

1.05 MOCK-UP

- A. Construct mock-up, 3 feet long by 3 feet wide; include panel and soffit system, glazing, attachments to building frame, associated vapor retarder and air seal materials, weep drainage system, sealants and seals, related insulation in mock-up.
- B. Locate where directed by Architect.
- C. Mock-up may remain as part of the Work.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.
- B. Store prefinished material off the ground and protected from weather; prevent twisting, bending, or abrasion; provide ventilation; slope metal sheets to ensure proper drainage.
- C. Prevent contact with materials that may cause discoloration or staining of products.

1.07 WARRANTY

- A. See Section 01 7800 - CLOSEOUT SUBMITTALS, for additional warranty requirements.
- B. Manufacturer Warranty:
 - 1. Finish Warranty: Provide manufacturer's special warranty covering failure of factory-applied exterior finish on metal roof panels and agreeing to repair or replace panels that

show evidence of finish degradation, including significant fading, chalking, cracking, or peeling within specified warranty period of no less than 20 year period from date of Substantial Completion.

- C. Installer's warranty: Provide warranty in which installer agrees to repair and replace components of the wall panel system that fail in material or workmanship within 2 years from the date of substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Metal Wall Panel (MWP-01): McElroy Mini Rib
- B. Metal Wall Panels - Exposed Fasteners:
 - 1. McElroy Metal: www.mcelroymetal.com/#sle.
 - 2. Morin Corporation: www.morincorp.com/#sle.
 - 3. Petersen Aluminum Corporation: www.pac-clad.com/#sle.

2.02 MANUFACTURED METAL PANELS

- A. Wall Panel System: Factory fabricated prefinished metal panel system, site assembled.
 - 1. Provide exterior wall panels, interior liner panels, soffit panels, and subgirt framing assembly.
 - 2. Design and size components to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of wall.
 - 3. Design Pressure: In accordance with ASCE 7, wind loads as indicated on structural plans and applicable codes.
 - 4. Maximum Allowable Deflection of Panel: $L/180$ for length(L) of span.
 - 5. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.
 - 6. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.
 - 7. Fabrication: Formed true to shape, accurate in size, square, and free from distortion or defects; pieces of longest practical lengths.
 - 8. Corners: Factory-fabricated in one continuous piece with minimum 2 inch returns or in profiles as indicated on plans.
- B. Exterior Wall Panels:
 - 1. Profile: Vertical; style as indicated.
 - a. Metal Wall Panel (MWP-01): McElroy Mini Rib
 - 1) Panel width: 36 inches.
 - 2) Material: Precoated galvalume sheet steel, 24 gauge, 0.0276 inch minimum thickness.
 - 3) Color: Selected from full range of manufacturers color options.
 - 2. Side Seams: Double-interlocked, tight-fitting, sealed with continuous gaskets.
- C. Subgirt Framing Assembly:
 - 1. 14 gage, 0.0785 inch thick formed non-precoated steel sheet spaced to comply with ASCE 7 wind loads.
- D. Internal and External Corners: Standard Mitered Corners: Same material, thickness, and finish as exterior sheets; profile to suit system; shop cut and factory mitered to required angles.
- E. Internal and External Corners: Micro-Seam Corners: Same material, thickness, and finish as exterior sheets; profile to suit system; shop cut and factory mitered to required angles; factory soldered together.
- F. Expansion Joints: Same material, thickness and finish as exterior sheets; ___ gage, ___ inch thick; manufacturer's standard brake formed type, of profile to suit system.

- G. Trim: Same material, thickness and finish as exterior sheets; brake formed to required profiles.
- H. Anchors: Galvanized steel.

2.03 MATERIALS

- A. Precoated Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M, Structural Steel (SS) or Forming Steel (FS), with G90/Z275 coating; continuous coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.
- B. Precoated Aluminum Sheet: ASTM B209 (ASTM B209M), 3105 alloy, O temper, smooth surface texture; continuous-coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.

2.04 FINISHES

- A. Exposed Surface Finish: Panel manufacturer's standard polyvinylidene fluoride (PVDF) coating, top coat over epoxy primer. Full color options to include Metallics and Micas.
- B. Panel Backside Finish: Panel manufacturer's standard siliconized polyester wash coat.

2.05 ACCESSORIES

- A. Gaskets: Manufacturer's standard type suitable for use with system, permanently resilient; ultraviolet and ozone resistant.
- B. Sealants: As specified in Section 07 9005.
- C. Fasteners: Manufacturer's standard type to suit application; with soft neoprene washers, steel, hot dip galvanized. Fastener cap same color as exterior panel.
- D. Field Touch-up Paint: As recommended by panel manufacturer.
- E. Bituminous Paint: Asphalt base.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that building framing members are ready to receive panels.
- B. Verify that water-resistive barrier has been installed over substrate completely and correctly.

3.02 PREPARATION

- A. Install subgirts perpendicular to panel length, securely fastened to substrates and shimmed and leveled to uniform plane. Space at intervals indicated.

3.03 INSTALLATION

- A. Install panels on walls and soffits in accordance with manufacturer's instructions.
- B. Sub girt spacing and panel attachment clips locations to be spaced and sized to comply with ASCE 7 wind load speeds and UL 580.
- C. Protect surfaces in contact with cementitious materials and dissimilar metals with bituminous paint. Allow to dry prior to installation.
- D. Fasten panels to structural supports; aligned, level, and plumb. Install fasteners to fit tight against face of metal panel but do not over-tighten to cause dent or damage to metal panel. Overtightened screws with dents are cause for panel rejection.
- E. Locate joints over supports and expansion joints where/as indicated.
- F. Lap panel ends minimum 2 inches.
- G. Apply galvanized coating to edges of cut steel panels.
- H. Use concealed fasteners unless otherwise approved by Architect.
- I. Seal and place foam or metal gaskets at ends to prevent weather penetration. Maintain neat appearance.

3.04 CLEANING

- A. Remove site cuttings from finish surfaces.
- B. Remove protective material from wall panel surfaces.
- C. Clean and wash prefinished surfaces with mild soap and water; rinse with clean water.

END OF SECTION

SECTION 07 4213.23
METAL COMPOSITE MATERIAL WALL PANELS

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

- A. Exterior curtain wall system consisting of formed metal composite material (MCM) sheet, framing, secondary supports, and anchors to structure.
- B. Matching flashing and trim.

1.02 PRICE AND PAYMENT PROCEDURES

1.03 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
- B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- D. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2016.
- E. ASTM A480/A480M - Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip; 2015.
- F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- G. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.
- H. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2025a.
- I. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- J. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.
- K. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- L. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
- M. ASTM D1781 - Standard Test Method for Climbing Drum Peel for Adhesives; 1998 (Reapproved 2012).
- N. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics; 2014.
- O. ASTM D4145 - Standard Test Method for Coating Flexibility of Prepainted Sheet; 2010.
- P. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- Q. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).
- R. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.
- S. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).
- T. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components; 2012.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data - MCM Sheets and Wall System: Manufacturer's data sheets on each product to be used, including thickness, physical characteristics, and finish, and:
 - 1. Physical characteristics of components shown on shop drawings including clips, extrusions, etc.
 - 2. Finish manufacturer's data sheet showing physical and performance characteristics.
 - 3. Storage and handling requirements and recommendations.
 - 4. Fabrication instructions and recommendations.
 - 5. Specimen warranty for finish, as specified herein.
- C. Shop Drawings: Show layout and elevations, dimensions and thickness of panels, connections, details and location of joints, sealants and gaskets, method of anchorage, exposed fasteners, number of anchors, supports, reinforcement, trim, flashings, and accessories.
 - 1. Indicate panel numbering system.
 - 2. Differentiate between shop and field fabrication.
 - 3. Indicate substrates and adjacent work with which the wall system must be coordinated.
 - 4. Include large-scale details of anchorages and connecting elements.
 - 5. Include large-scale details or schematic, exploded or isometric diagrams to fully explain flashing at a scale of not less than 1-1/2 inches per 12 inches.
 - 6. Include design engineer's stamp or seal on shop drawings for attachments and anchors.
- D. Selection Samples: For each finish product specified, submit at least three sample color chips representing manufacturer's standard range of available colors and patterns.
- E. Design Data: Submit structural calculations stamped by design engineer, for Architect's information and project record. Include additional review comments on project specific details where installation may be different than tested wall assembly system.
- F. Test Report: Submit report of full-size mock-up tests for air infiltration, water penetration, and wind performance.
- G. Test Report: Submit report of full-size mock-up test for NFPA 285 fire performance.
- H. Manufacturer's Field Reports: Provide within 48 hours of field review. State what was observed and what changes, if any, were requested or required.
- I. Installer's Qualification Statement.
- J. Testing Agency's Qualification Statement.
- K. Maintenance Data: Care of finishes and warranty requirements.
- L. Executed Warranty: Submit warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Design Engineer's Qualifications: Design structural supports and anchorages under direct supervision of a Structural Engineer experienced in design of this type of work and licensed in the State of Arkansas.
- B. Wall System Manufacturer Qualifications: Company specializing in manufacturing wall panel systems specified in this section.
 - 1. With not less than 20 years of documented experience.
 - 2. Approved by MCM sheet manufacturer.
 - 3. Submit contact names and phone numbers for at least three references connected with successful past projects.
- C. Installer Qualifications: Company specializing in performing work of the type specified in this section.
 - 1. With minimum five years of documented experience.

2. Approved by wall panel system manufacturer.
 3. Submit contact names and phone numbers for at least three references connected with successful past projects.
- D. Testing Agency Qualifications: Independent agency experienced in testing assemblies of the type required for this project and having the necessary facilities for full-size mock-up testing of the type specified.
- E. Mock-Up: Provide a mock-up for evaluation of fabrication workmanship.
1. Locate where directed.
 2. Provide panels finished as specified.
 3. Mock-up may remain as part of the Work.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in manufacturer's original, unopened, undamaged containers with identification labels intact.
1. Protect finishes by applying heavy duty removable plastic film during production.
 2. Package for protection against transportation damage.
 3. Provide markings to identify components consistently with drawings.
 4. Exercise care in unloading, storing and installing panels to prevent bending, warping, twisting and surface damage.
- B. Store products protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
1. Store in well ventilated space out of direct sunlight.
 2. Protect from moisture and condensation with tarpaulins or other suitable weather tight covering installed to provide ventilation.
 3. Store at a slope to ensure positive drainage of any accumulated water.
 4. Do not store in any enclosed space where ambient temperature can exceed 120 degrees F.
 5. Avoid contact with any other materials that might cause staining, denting, or other surface damage.

1.07 WARRANTY

- A. See Section 01 7800 - CLOSEOUT SUBMITTALS, for additional warranty requirements.
- B. MCM Sheet Manufacturer's Finish Warranty: Provide manufacturer's written warranty stating that the finish will perform as follows for minimum of 30 years:
1. Chalking: No more than that represented by a No. 8 rating based on ASTM D4214.
 2. Color Retention: No fading or color change in excess of 5 Hunter color difference units, calculated in accordance with ASTM D2244.
 3. Gloss Retention: Minimum of 30 percent gloss retention, when tested in accordance with ASTM D523.
- C. Installation Warranty for Dry Seal (Caulked) Assembly: Correct defective work within a ten year period after Date of Substantial Completion, including defects in water tightness and integrity of seals for metal wall panels.
- D. Installation Warranty for Building Rainscreen Assembly: Installer of exterior rainscreen assembly (including attachments, framing, and exterior panels) to provide 10-year warranty that includes coverage for defective materials and/or workmanship. This warranty will also clearly include materials, labor, necessary activity to access these areas, and removal of any materials to effect repairs and restore to watertight conditions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Metal Composite Material (MCM) Sheet Manufacturers:
1. 3A Composites USA; Alucobond Plus: www.3acompositesusa.com/#sle.
 2. Alfrex, LLC; Alfrex fr: www.alfrexusa.com/#sle.

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METAL COMPOSITE MATERIAL WALL PANELS

Little Rock Eye Clinic West

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DESIGN DEVELOPMENT

05/05/2026

3. ALPOLIC Materials; ALPOLIC/fr (Fire Retardant core): www.alpolic-americas.com/#sle.
4. Alucoil North America LLC; larson by Alucoil, FR Core (fire resistant): www.alucoilnorthamerica.com/#sle.
5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 WALL PANEL SYSTEM

- A. Wall Panel System: Metal panels, fasteners, and anchors designed to be supported by framing or other substrate provided by others; provide installed panel system capable of maintaining specified performance without defects, damage or failure.
 1. Provide structural design by or under direct supervision of a Structural Engineer licensed in the State of Arkansas.
 2. Provide panel jointing and weatherseal using reveal joints and gaskets but no sealant.
 3. Anchor panels to supporting framing without exposed fasteners.
- B. PERFORMANCE REQUIREMENTS
 1. Thermal Movement: Provide for free and noiseless vertical and horizontal thermal movement due to expansion and contraction under material temperature range of minus 20 degrees F to 180 degrees F without buckling, opening of joints, undue stress on fasteners, or other detrimental effects; allow for ambient temperature at time of fabrication, assembly, and erection procedures.
 2. Wind Performance: Provide system tested in accordance with ASTM E330/E330M without permanent deformation or failures of structural members under the following conditions:
 - a. Inward Design Wind Pressure: 26 psf.
 - b. Outward Design Wind Pressure: 30 psf.
 - c. Maximum deflection of perimeter framing member of L/175 normal to plane of the wall; maximum deflection of individual panels of L/60.
 - d. Maximum anchor deflection in any direction of 1/16 inch at connection points of framing members to anchors.
 3. Air Infiltration: 0.06 cfm/sq ft of wall area, maximum, when tested at 1.57 psf in accordance with ASTM E283.
 4. Water Penetration: No water penetration under static pressure when tested in accordance with ASTM E331 at a differential of 10 percent of inward acting design load, 6.24 psf minimum, after 15 minutes.
 - a. Water penetration is defined as the appearance of uncontrolled water on the interior face of the wall.
 - b. Design to drain leakage and condensation to the exterior face of the wall.
 5. Fire Performance: Tested in accordance with, and complying with the acceptance criteria of, NFPA 285; testing performed for previous project is acceptable provided tested system was truly equivalent.
- C. Panels: One inch deep pans formed of metal composite material sheet by routing back edges of sheet, removing corners, and folding edges.
 1. Reinforce corners with riveted aluminum angles.
 2. Provide concealed attachment to supporting structure by adhering attachment members to back of panel; attachment members may also function as stiffeners.
 3. Maintain maximum panel bow of 0.8 percent of panel dimension in width and length; provide stiffeners of sufficient size and strength to maintain panel flatness without showing local stresses or read-through on panel face.
 4. Reinforce panels over 60 inches long with metal angle braces 24 inches on center in short direction minimum, or as directed by MCM manufacturer.
 5. Secure members to back face of panels using structural silicone sealant approved by MCM sheet manufacturer.
 6. Metallic Finished Panels: Maintain consistent grain of MCM sheet; specifically, do not rotate sheet purely to avoid waste.
 7. Fabricate panels under controlled shop conditions.

8. Where final dimensions cannot be established by field measurement before commencement of manufacturing, make allowance for field adjustments without requiring field fabrication of panels.
9. Fabricate as indicated on drawings and as recommended by MCM sheet manufacturer.
 - a. Make panel lines, breaks, curves and angles sharp and true.
 - b. Keep plane surfaces free from warp or buckle.
 - c. Keep panel surfaces free of scratches or marks caused during fabrication.
10. Provide joint details providing a watertight and structurally sound wall panel system that allows no uncontrolled water penetration on inside face of panel system.
11. For "dry" jointing, secure extrusions to returned pan edges with stainless steel rivets; provide means of concealed drainage with baffles and weeps for water that might accumulate in members of system.

2.03 MATERIALS

- A. Metal Composite Material (MCM) Sheet: Two sheets of aluminum sandwiching a core of mineral filled fire-resistant polymer material; no foamed insulation material content.
 1. Overall Sheet Thickness: 0.157 inch, minimum (4mm)
 2. Face Sheet Thickness: 0.020 inches, minimum (0.5mm)
 3. Alloy: Manufacturer's standard, selected for best appearance and finish durability.
 4. Bond and Peel Strength: No adhesive failure of the bond between the core and the skin nor cohesive failure of the core itself below 22.4 inch-pound/inch with no degradation in bond performance, when tested in accordance with ASTM D1781, simulating resistance to panel delamination, after 8 hours of submersion in boiling water and after 21 days of immersion in water at 70 degrees F.
 5. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
 6. Flammability: Self-ignition temperature of 650 degrees F or greater, when tested in accordance with ASTM D1929.
- B. Metal Framing Members: Include sub-girts, zee-clips, base and sill angles and channels, hat-shaped and rigid channels, and furring channels required for complete installation.
 1. Provide material strength, dimensions, configuration as required to meet the applied loads applied and in compliance with applicable building code.
 2. Sheet Steel Components: ASTM A653/A653M galvanized to G90/Z275 or zinc-iron alloy-coated to A60/ZF180; or ASTM A792/A792M aluminum-zinc coated to AZ60/AZM180.
 3. Stainless Steel Sheet Components: ASTM A480/A480M.
 4. Aluminum Components: ASTM B209 (ASTM B209M); or ASTM B221 (ASTM B221M).

2.04 FINISHES

- A. Factory Finish: Two coat fluoropolymer resin coating (including Mica finishes), approved by coating manufacturer for length of warranty specified for project, and applied by coil manufacturing facility that specializes in coil applied finishes.
 1. Basis of Design: fluoropolymer resin coating as manufactured by Alfrex.
 2. Coating Flexibility: Pass ASTM D4145 minimum 1T Bend, at time of manufacturing.
 3. Long-Term Performance: Not less than that specified under WARRANTY in PART 1.
- B. Color/Texture: As selected by Architect from manufacturer's standard and custom range, including mica finishes.
 1. MCM-01: To Be Determined - will select from standard or mica finish.
 2. MCM-02: To be Determined - will select from standard or mica finish.

2.05 ACCESSORIES

- A. Flashing: Sheet aluminum; 0.040 inch thick, minimum; finish and color to match MCM sheet; refer to Section 07 6200 for additional requirements.
- B. Anchors, Clips and Accessories: Use one of the following:

1. Stainless steel complying with ASTM A276/A276M, ASTM A480/A480M, or ASTM A666/A666M.
 2. Steel complying with ASTM A36/A36M and hot-dipped galvanized to ASTM A153/A153M.
 3. Steel complying with ASTM A36/A36M and hot-dipped galvanized to ASTM A123/A123M Coating Grade 10.
- C. Fasteners:
1. Exposed Fasteners: Stainless steel; permitted only where absolutely unavoidable and subject to prior approval of the Architect.
 2. Screws concealed within assembly: Self-drilling or self-tapping Type 410 stainless steel or zinc-alloy steel hex washer head, with EPDM or PVC washer under heads of fasteners bearing on weather side of metal wall panels.
 3. Bolts: Stainless steel.
 4. Fasteners for Flashing and Trim: Blind fasteners of high-strength aluminum or stainless steel.
- D. Joint Sealer: As specified in Section 07 9005, subject to MCM sheet manufacturer's approval.
- E. Provide panel system manufacturer's and installer's standard corrosion resistant accessories, including fasteners, clips, anchorage devices and attachments.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine dimensions, tolerances, and interfaces with other work.
- B. Examine substrate on-site to determine that conditions are acceptable for product installation in accordance with manufacturers written instructions.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- D. Notify Architect in writing of conditions detrimental to proper and timely completion of work, and do not proceed with erection until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Protect adjacent work areas and finish surfaces from damage during installation.
- B. Provide anchorage items to be cast into concrete or built into masonry to appropriate installer(s) together with setting templates.

3.03 INSTALLATION

- A. Do not install products that are defective, including warped, bowed, dented, and broken members, and members with damaged finishes.
- B. Fabricate and form panels with hairline joints and crisp edges.
- C. Comply with instructions and recommendations of MCM sheet manufacturer and wall system manufacturer, as well as with approved shop drawings.
- D. Install wall system securely allowing for necessary thermal and structural movement; comply with wall system manufacturer's instructions for installation of concealed fasteners. Attach wall system supports to structure as not to disrupt or compromise the weather barrier system. Repair and/or patch any damage caused to weather barrier system due to installation of wall panel attachments.
- E. Do not handle or tool products during erection in manner that damages finish, decreases strength, or results in visual imperfection or failure in performance. Return component parts that require alteration to shop for refabrication, if possible, or for replacement with new parts.
- F. Do not form panels in field unless required by wall system manufacturer and approved by the Architect; comply with MCM sheet manufacturer's instructions and recommendations for field forming.

- G. Separate dissimilar metals; use gasket fasteners, isolation shims, or isolation tape where needed to eliminate possibility of electrolytic action between metals.
- H. Where joints are designed for field applied sealant, seal joints completely with specified sealant. In addition to rainscreen extrusions, at joints exposed vertically, install sealant to protect from water intrusion.
- I. Install flashings as indicated on shop drawings. At flashing butt joints, provide a lap strap under flashing and seal lapped surfaces with a full bed of non-hardening sealant.
- J. Install square, plumb, straight, and true, accurately fitted, with tight joints and intersections maintaining the following installation tolerances:
 1. Variation From Plane or Location: 1/2 inch in 30 feet of length and up to 3/4 inch in 300 feet, maximum.
 2. Deviation of Vertical Member From True Line: 0.1 inch in 25 feet run, maximum.
 3. Deviation of Horizontal Member From True Line: 0.1 inch in 25 feet run, maximum.
 4. Offset From True Alignment Between Two Adjacent Members Abutting End To End, In Line: 0.03 inch, maximum.
- K. Inspect all panels for installed weep locations to ensure proper drainage of any accumulated water or moisture behind panel system. At soffit panel locations, install weeps to permit drainage.
- L. Replace damaged products.

3.04 FIELD QUALITY CONTROL

- A. Wall System Manufacturer's Field Services: Provide field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with instructions.

3.05 CLEANING

- A. Ensure weep holes and drainage channels are unobstructed and free of dirt and sealants.
- B. Remove protective film after installation of joint sealers, after cleaning of adjacent materials, and immediately prior to completion of work.
- C. Remove temporary coverings and protection of adjacent work areas.
- D. Clean installed products in accordance with manufacturer's instructions.

3.06 PROTECTION

- A. Protect installed panel system from damage until Date of Substantial Completion.

END OF SECTION

**SECTION 07 5400
THERMOPLASTIC MEMBRANE ROOFING**

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

- A. Single ply thermoplastic roofing membrane fully adhered system.
- B. Insulation, flat and tapered.
- C. Roofing cant strips, stack boots, roofing expansion joints, and walkway pads.

1.02 REFERENCE STANDARDS

- A. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2010, with 2013 Supplements and Errata.
- B. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2013.
- C. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2014.
- D. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014.
- E. ASTM D6878/D6878M - Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing; 2013.
- F. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces; 2011.
- G. FM (AG) - FM Approval Guide; current edition.
- H. FM DS 1-28 - Wind Design; 2007.
- I. NRCA (RM) - The NRCA Roofing Manual; 2017.
- J. NRCA (WM) - The NRCA Waterproofing Manual; 2005.
- K. UL (FRD) - Fire Resistance Directory; current edition.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section.
 - 1. Review preparation and installation procedures and coordinating and scheduling required with related work.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's catalog data for membrane materials including flashing materials, insulation, fasteners, and adhesives.
- C. Shop Drawings: Submit drawings that indicate joint or termination detail conditions, conditions of interface with other materials, mechanical fastener layout, and paver layout.
 - 1. Include UL Assembly and FM Assembly Compliance.
- D. Wind resistance documentation including uplift wind pressures, calculations, assembly installation methods and manufacturer's certification on uplift pressures.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Installer's Qualification Statement.
- G. Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions.
- H. Manufacturer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and supplementary instructions given.
- I. Manufacturer's Qualification Statement.

- J. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer. Provide letter from manufacturer indicating intent to warrant the roofing system.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with at least three years of documented experience and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original containers, dry and undamaged, with seals and labels intact.
- B. Store materials in weather protected environment, clear of ground and moisture.
- C. Ensure storage and staging of materials does not exceed static and dynamic load-bearing capacities of roof decking.
- D. Protect foam insulation from direct exposure to sunlight.

1.07 WARRANTY

- A. See Section 01 7800 - CLOSEOUT SUBMITTALS, for additional warranty requirements.
- B. Manufacturer's Warranty:
 - 1. Material Warranty: Provide single-source manufacturer's No Dollar Limit (NDL) warranty for weathertightness of roofing system, include agreement to repair and/or replace roofing that fails to keep out water within specified warranty period of 20 years from date of Substantial Completion.
 - 2. Warranty coverage to include roofing membrane, base flashings, liquid applied flashing, roofing membrane accessories, roof insulation, fasteners, cover board, walkway products, manufacturer's expansion joints, edge metal products, parapet caps, and other single-source components of roofing system marketed by the manufacturer.
- C. Installer's Warranty: Provide warranty in which installer agrees to repair and replace components of the roofing system that fail in materials or workmanship within 2 years from the date of Substantial Completion.
 - 1. Warranty coverage to include work of the Section, including all components of roofing system such as membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders and walkway products.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Thermoplastic Polyolefin (TPO) Membrane Materials:
 - 1. Carlisle Roofing Systems, Inc; Sure-Weld TPO: www.carlisesyntec.com.
 - 2. Firestone Building Products, LLC: www.firestonebpco.com/#sle.
 - 3. Johns Manville Corporation JM TPO: www.jm.com..
 - 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Insulation:
 - 1. Atlas Roofing Corporation: www.atlasroofing.com.
 - 2. Carlisle SynTec; SecurShield Insulation: www.carlisle-syntec.com/#sle.
 - 3. GAF: www.gaf.com/#sle.
 - 4. Owens Corning Corporation: www.ocbuildingspec.com/#sle.
 - 5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ROOFING SYSTEM DESCRIPTION

- A. Thermoplastic Membrane Roofing: One ply membrane, fully adhered, over insulation.
- B. Roofing System Requirements:

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THERMOPLASTIC MEMBRANE ROOFING
DESIGN DEVELOPMENT

05/05/2026

1. Warranty: Full system warranty covering membrane, roof insulation, and membrane accessories.
 2. Solar Reflectance Index (SRI): 78, minimum, calculated in accordance with ASTM E1980.
 - a. Field applied coating may not be used to achieve specified SRI.
 3. Roof Covering External Fire Resistance Classification: UL (FRD) Class A.
 4. Factory Mutual Classification: Class 1 and windstorm resistance of 1-90, in accordance with FM DS 1-28.
 5. Wind resistance: Roofing system must be successfully tested by a qualified testing agency following ANSI/FM 4474 to resist the design uplift pressures calculated by the American Society of Civil Engineers (ASCE) 7 and after multiplying the results with a safety factor (determined by design professional), but assembly uplift pressures shall be not less than 60 lbs. / sq. ft.
 6. Insulation Thermal Resistance (R-Value): 3 per inch, minimum; provide insulation of thickness required to achieve minimum LTTR of 26 at any location.
- C. Roofing System Components: Listed in order from the top of the roof down:
1. Membrane: Thicknesses as specified, fully adhered.
 2. Coverboard Over Insulation: Mechanically attached.
 3. Insulation: Mechanically attached.
 4. Structural base.

2.03 MEMBRANE ROOFING AND ASSOCIATED MATERIALS

- A. Membrane Roofing Materials:
1. TPO: Thermoplastic polyolefin (TPO) complying with ASTM D6878/D6878M, sheet contains reinforcing fabrics or scrim.
 - a. Thickness: 60 mil, 0.060 inch, minimum.
- B. Flexible Flashing Material: Same material as membrane.
- C. Water Pervious Fabric: Woven polyethylene, UV stabilized, open to moisture movement, black.

2.04 DECK SHEATHING & COVERBOARD

- A. Deck Sheathing & Coverboard : Glass-mat faced gypsum panels complying with ASTM C1177/C1177M.
1. Thickness: 5/8 inch, Type X, fire resistant.
 2. Manufacturers:
 - a. Georgia-Pacific; DensDeck Prime with EONIC Technology:
www.densdeck.com/#sle.

2.05 INSULATION

- A. Polyisocyanurate (ISO) Board Insulation: Rigid cellular foam, complying with ASTM C1289.
1. Classifications:
 - a. Type II:
 - 1) Class 1 - Faced with glass fiber reinforced cellulosic felt facers on both major surfaces of core foam.
 - 2) Compressive Strength: Classes 1-2-3, Grade 1 - 16 psi (110 kPa), minimum.
 - 3) Thermal Resistance, R-value: At 1-1/2 inch thick; Class 1, Grades 1-2-3 - 8.4 (1.48) at 75 degrees F.
 2. Board Size: 48 by 96 inch.
 3. Board Thickness: 2.0 inch. minimum. Provide insulation in layers as necessary to achieve specified LTTR, minimum 2 layers of insulation.
 4. Tapered Board: Slope as indicated; minimum thickness 0.5 inch; fabricate of fewest layers possible.

2.06 ACCESSORIES

- A. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.
- B. Sheet Metal Flashings: See Section 07 6200.
- C. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.
 - 1. Length as required for thickness of insulation material and penetration of deck substrate, with metal washers.
- D. Thinners and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.
- E. Insulation Adhesive: As recommended by insulation manufacturer.
- F. Sealants: As recommended by membrane manufacturer.
- G. Walkway Pads: Suitable for maintenance traffic, contrasting color or otherwise visually distinctive from roof membrane.
 - 1. Composition: Roofing membrane manufacturer's standard.
 - 2. Size: 18 by 18 inch.
 - 3. Surface Color: White or yellow.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck is supported and secure.
- C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
- D. Verify deck surfaces are dry and free of snow or ice.
- E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.02 INSTALLATION - GENERAL

- A. Perform work in accordance with manufacturer's instructions, NRCA (RM), and NRCA (WM) applicable requirements.
- B. Do not apply roofing membrane during unsuitable weather.
- C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.
- D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.
- F. Coordinate this work with installation of associated counterflashings installed by other sections as the work of this section proceeds.
- G. Install blocking at all locations where fastening occurs where structure is not located. Blocking required but not limited at parapets, termination bars, and as shown on drawings.

3.03 INSULATION APPLICATION - UNDER MEMBRANE

- A. Attachment of Insulation:
 - 1. Mechanically fasten insulation to deck in accordance with roofing manufacturer's instructions and FM (AG) Factory Mutual requirements.
- B. Cover Boards: Fully adhere cover boards in accordance with roofing manufacturer's instructions and FM (AG) Factory Mutual requirements.

- C. Lay subsequent layers of insulation with joints staggered minimum 6 inch from joints of preceding layer.
- D. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.
- E. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.
- F. At roof drains, use factory-tapered boards to slope down to roof drains over a distance of 18 inches.
- G. Install tapered insulation at roof drain counterslope to be twice the main roof slope.
- H. Do not apply more insulation than can be covered with membrane in same day.

3.04 MEMBRANE APPLICATION

- A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.
- B. Shingle joints on sloped substrate in direction of drainage.
- C. Fully Adhered Application: Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls. Adhesive amount must conform to FM Assembly requirements.
- D. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches. Seal permanently waterproof.
- E. At intersections with vertical surfaces:
 1. Extend membrane over cant strips and up a minimum of 8 inches onto all vertical surfaces.
 2. At parapet and roof edge locations, extend membrane system up vertical surface, under parapet cap to outside edge of parapet.
- F. Around roof penetrations, seal flanges and flashings with flexible flashing.
- G. Install roofing expansion joints where indicated. Make joints watertight.
 1. Install prefabricated joint components in accordance with manufacturer's instructions.
- H. Coordinate installation of roof drains and sumps and related flashings.
- I. Seal perimeter of entire roofing system membrane to weather barrier.

3.05 FINISHING UNBALLASTED SURFACES

- A. Install walkway pads. Space pad joints to permit drainage.
- B. Place walkway pads around perimeter of all rooftop mounted equipment, roof hatches, ladders, roof access doors and/or as indicated on drawings. Provide paths from roof access locations to all rooftop equipment.

3.06 FIELD QUALITY CONTROL

- A. Require site attendance of roofing and insulation material manufacturers daily during installation of the Work.

3.07 CLEANING

- A. Remove bituminous markings from finished surfaces.
- B. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and comply with their documented instructions.
- C. Repair or replace defaced or damaged finishes caused by work of this section.

3.08 PROTECTION

- A. Protect installed roofing and flashings from construction operations. Daily remove any object(s) that may cause damage to roofing system.

- B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION

**SECTION 07 6200
SHEET METAL FLASHING AND TRIM**

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

- A. Fabricated sheet metal items, including flashings, counterflashings, gutters, and downspouts.
- B. Sealants for joints within sheet metal fabrications.
- C. Sheet metal splash pans.

1.02 REFERENCE STANDARDS

- A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2012.
- B. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2013.
- C. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- D. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.
- E. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2009.
- F. ASTM D4479/D4479M - Standard Specification for Asphalt Roof Coatings - Asbestos-Free; 2007 (Reapproved 2012).
- G. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012).
- H. CDA A4050 - Copper in Architecture - Handbook; current edition.
- I. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate material profile, material thickness, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
- C. Samples: Submit one sample, 12 x 12 inch minimum in size illustrating material and fabrication details of typical standing seam profiles.
- D. Samples: Submit two samples 2 x 3 inch in size illustrating metal finish color.
 - 1. Color chart can be submitted preliminary as long as a physical sample is submitted for final approval

1.04 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.
- B. Maintain one copy of each document on site.
- C. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 3 years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials that could cause discoloration or staining.

1.06 WARRANTY

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

- B. Reference roofing specifications for warranty limits and terms that apply. Products or fabrications installed with the roofing system to contain manufacturer's warranty as specified in roofing specification section.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Sheet Metal Flashing and Trim Manufacturers:
 - 1. Petersen Aluminum Corporation: www.pac-clad.com/#sle.
 - 2. Metal Era Inc. www.metalera.com.
 - 3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SHEET MATERIALS

- A. Pre-Finished Aluminum: ASTM B209 (ASTM B209M); 0.032 inch thick minimum; plain finish shop pre-coated with fluoropolymer coating.
 - 1. Fluoropolymer Coating: High Performance Organic Finish, AAMA 2604; multiple coat, thermally cured fluoropolymer finish system.
 - 2. Color: As selected by Architect from manufacturer's standard colors.

2.03 FABRICATION

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal and other characteristics of item indicated. Shop fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication.
- B. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
- C. Form sections true to shape, accurate in size, square, and free from distortion or defects. Fabricate metal flashing and trim without excessive oil canning, buckling and tool marks, true to line and levels indicated with exposed edges folded back to form hems.
- D. Form pieces in longest possible lengths to a maximum of 15 feet unless specifically approved otherwise by Architect. Treat seams between two different pieces with flat-lock seams at non-moving joints, unless otherwise indicated. At moving seams, use seated, lapped, bayonet type or interlocking hooked seams.
- E. All exposed edges to be folded back with hem of 1/2 inch; miter and seam corners.
- F. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- G. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.
- H. Expansion Provisions: Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joint of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric sealant concealed within joints. Provide for expansion no more than in 40 feet long sections.
- I. Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.
- J. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
 - 1. Thickness: As recommended by SMACNA's "Architectural Sheet Metal Manual" for application but not less than the thickness of the metal being secured.

2.04 GUTTER AND DOWNSPOUT FABRICATION

- A. Gutters: SMACNA Architectural Sheet Metal Manual, Square profile - 6".
 - 1. Lengths to be continuous no longer than 40 foot sections.
 - 2. Joints to be flat-lock seam with sealant.

3. Corners to be factory mitered and welded.
 4. Expansion joints to have end of each gutter capped, allow for 1" of expansion between gutters and covered with coverplate.
- B. Downspouts: Rectangular profile 4" wide x 3" deep or unless indicated otherwise.
1. Same as Gutters except: Vertical seams to be Double Corner Seam with sealant.
- C. Accessories: Profiled to suit gutters and downspouts.
1. Anchorage Devices: In accordance with SMACNA requirements with Stainless Steel or Aluminum fasteners.
 2. Gutter Supports: Straps of size per SMACNA requirements, but not less than twice the thickness of the gutter material.
 3. Downspout Supports: Straps.
 4. Valley Diverters: 12-inch x 12-inch minimum at valley, 0.040 inch thick minimum. Extend a minimum of 4" above eave edge.
- D. Splash Pans: Same metal type as downspouts, formed to 8 by 12 inch size; rolled sides of 3 inch high for inverted pan placement.
- E. Seal metal joints, see Joint Sealants.

2.05 ACCESSORIES

- A. Fasteners: Aluminum or Stainless Steel, with soft neoprene washers.
- B. Underlayment: ASTM D226/D226M, organic roofing felt, Type I (No. 15).
- C. Protective Backing Paint: Zinc molybdate alkyd.
- D. Concealed Sealants: Non-curing butyl sealant.
- E. Flexible Flashing: Self-adhered flashing as specified in Section 07 2500.
- F. Sealants: Type as specified in Section 07 9200.
- G. Plastic Cement: ASTM D4586/D4586M, Type I.

2.06 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Manufactured Straight and Radius Copings: See Section 07 7100.
- B. Manufactured Roof Edge / Gravel Stop Edge: See Section 07 7100.
- C. Accessories:
 1. Splice Plates: Same thickness as coping, minimum.
 2. Cleats: Same thickness as coping, minimum.

2.07 WALL SHEET METAL FABRICATIONS

- A. Opening Flashings in Frame Constructions: Fabricate head, sill and similar flashing to extend beyond openings as indicated. Unless otherwise indicated, form head and sill flashing with 2-inch high end dams.

2.08 MISCELLANEOUS SHEET METAL FABRICATIONS

- A. Beam and Column Surrounds: Fabricate as detailed, reinforced as required for a smooth, even appearance without oil-canning or distortions, with tight seams and all exposed edges hemmed.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.

- B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.03 INSTALLATION GENERAL

- A. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted. Install system to comply with FMG or ES-1 system ratings.
- B. Apply plastic cement compound between metal flashings and felt flashings.
- C. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- D. Secure gutters and downspouts in place with concealed fasteners. Pop-rivets are not concealed Fasteners.
- E. Set splash pans under downspouts. Coordinate attachment with roofing system.
- F. Finishes: Touchup all scratches to painted finish in field with paint to match.

3.04 ROOF DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.
- B. Hanging Gutters: Join sections with riveted and soldered joints or with lapped joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchored straps spaced not more than 24 inches apart. Provide enclosures and seal watertight with sealant. Slope gutters 1/4 inch per 10 feet minimum to downspouts.
 - 1. Fasten gutter spacers to front and back of gutter.
 - 2. Loosely lock straps to front gutter bead and anchor to roof deck.
 - 3. Anchor and loosely lock back edge of gutter to continuous eave or apron flashing.
 - 4. Anchor back of gutter that extends onto roof deck with cleats spaces not more than 24 inches apart.
 - 5. Install gutter with expansion joints at locations indicated or not exceeding 40 feet apart.
- C. Downspouts: Join sections with 1-1/2" telescoping joints.
 - 1. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches o.c. in between.
 - 2. Secure downspouts to building with straps and mechanical fasteners. Do not use pop-rivets.
 - 3. Provide elbows at base of downspout to direct water away from building.
- D. Collection Boxes: Anchor securely to wall.

3.05 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal roof flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, an level as indicated. Install work with laps, joints and seams that will be permanently watertight.
- B. Roof Edge Flashing and Copings: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone and as indicated. Comply with installation requirements of roofing manufacturer regarding spacing of anchors below membrane flashing in field of roof.
 - 1. Install flexible flashing covering entire substrate beneath coping; not required where roofing material extends beneath coping. Seal perimeters against weather barrier and/or roofing.
 - 2. Interlock bottom edge of roof edge flashing with continuous cleats anchored to substrate at minimum 8-inch centers.

- C. Pipe or Post Counterflashing: Install counter flashing umbrella with close -fitting collar with top edge flared for elastomeric sealant, extending a minimum of 4 inches of base of flashing. Install stainless steel draw band and tighten.
- D. Counterflashing: Coordinate installation of counter flashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints a minimum of 4 inches and bed with elastomeric sealant.
 - 1. Secure in a waterproof manner by means of anchor and washer at 36-inch centers.
- E. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof.

3.06 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetration moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors and louvers.
- B. Opening Flashings in Frame Construction: Install continuous head, sill and similar flashings to extend beyond wall openings a minimum of 4 inches or as indicated.
- C. Install reglets per manufacturer's recommendations.

3.07 MISCELLANEOUS FLASHING INSTALLATION

- A. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

3.08 FIELD QUALITY CONTROL

- A. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

END OF SECTION

**SECTION 07 7100
ROOF SPECIALTIES**

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

- A. Factory manufactured roof specialties, including straight and radius copings copings, fascias, gravel stops, vents, and roof edges.
- B. Roof expansion joints and covers.

1.02 REFERENCE STANDARDS

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.
- B. ANSI/SPRI/FM 4435/ES-1 - Test Standard for Edge Systems Used with Low Slope Roofing Systems; 2017.
- C. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012).
- D. NRCA (RM) - The NRCA Roofing Manual; 2017.
- E. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on shape of components, materials and finishes, anchor types and locations.
- C. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work.
- D. Manufacturer's Installation Instructions: Indicate special procedures, fasteners, supporting members, and perimeter conditions requiring special attention.

1.04 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Manufacturer's Warranty:
 - 1. Material Warranty: Provide warranty to repair and/or replace components that fails to keep out water within specified warranty period of 20 years from date of Substantial Completion. Warranty must be compatible with overall roofing system manufacturer.
 - 2. Performance Warranty: Provide warranty to repair and/or replace components that fails to withstand 120 mph wind speeds for specified warranty period of 20 years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Straight Copings and Roof Edges:
 - 1. Architectural Products Co: www.archprod.com/#sle.
 - 2. Metal-Era Inc: www.metalera.com/#sle.
 - 3. Peterson Aluminum Corp; www.pac-clad.com
 - 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Radius Copings:
 - 1. Metal Era Inc: www.metalera.com.
 - 2. Peterson Aluminum Corp; www.pac-clad.com
 - 3. Substitutions: See Section 01 6000- Product Requirements.
- C. Pipe and Penetration Flashings:
 - 1. Portals Plus: www.portalsplus.com/#sle.

2.02 COMPONENTS

- A. Roof Edge Flashings: Factory fabricated to sizes required; mitered, welded corners; concealed fasteners.
 - 1. Configuration: Fascia, cant, and edge securement for roof membrane.
 - 2. Pull-Off Resistance: Tested in accordance with ANSI/SPRI/FM 4435/ES-1 using test methods RE-1 and RE-2 to positive and negative design wind pressure as defined by applicable local building code.
 - 3. Material: Formed aluminum sheet, 0.050 inch thick, minimum.
 - 4. Finish: 70 percent polyvinylidene fluoride.
 - 5. Color: To be selected by Architect from manufacturer's standard ranges, including metallics.
 - 6. Manufacturers:
 - a. Basis of Design: Peterson Aluminum Corp; Pac-Loc Fascia 2000: www.pac-clad.com
- B. Straight Copings: Factory fabricated to sizes required; mitered, welded corners; concealed fasteners, .
 - 1. Configuration: Concealed 20 ga. hold down cleat at both legs; internal splice piece at joints of same material, thickness and finish as cap; concealed stainless steel fasteners. Cleat to be nominal 1'-0" in width and located at approximately 4'-0" o.c.
 - 2. Pull-Off Resistance: Tested in accordance with ANSI/SPRI/FM 4435/ES-1 using test method RE-3 to positive and negative design wind pressure as defined by applicable local building code.
 - 3. Material: Formed aluminum sheet, 0.050 inch thick, minimum.
 - 4. Finish: 70 percent polyvinylidene fluoride.
 - 5. Color: To be selected by Architect from manufacturer's standard range.
 - 6. Manufacturers:
 - a. Basis of Design: Peterson Aluminum Corp; Pac-Tite: www.pac-clad.com
- C. Control and Expansion Joint Covers: Composite construction of 4 inch wide flexible EPDM flashing of black color with closed cell urethane foam backing, each edge seamed to aluminum sheet metal flanges, designed for nominal joint width of 2 inch. Include special formed corners, tees, intersections, and wall flashings, each sealed watertight.

2.03 FINISHES

- A. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; color as selected from manufacturer's standard colors.

2.04 ACCESSORIES

- A. Sealant for Joints in Linear Components: As recommended by component manufacturer. Type as specified in Section 07 9200.
- B. Adhesive for Anchoring to Roof Membrane: Compatible with roof membrane and approved by roof membrane manufacturer.
- C. Roof Cement: ASTM D4586/D4586M, Type II.
- D. Flexible Flashing: See Section 07 2500.
- E. Fasteners: Stainless steel screw type with a minimum pull-out resistance of 240 # (109 kg) as supplied by the manufacturer per substrate application. No exposed fasteners shall be permitted.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that deck, curbs, roof membrane, base flashing, and other items affecting work of this Section are in place and positioned correctly.

3.02 INSTALLATION

- A. Install components in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
- B. Conform to SMACNA Architectural Sheet Metal Manual (ASMM) drawing details.
- C. Roof Edge, Specialty Coping and Radius Copings: Anchor to resist uplift and outlet forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone and as indicated. Comply with installation requirements of roofing manufacturer regarding spacing of anchors below membrane flashing in field of roof.
 - 1. Install flexible flashing covering entire substrate beneath coping; not required where roofing membrane extends beneath coping. Seal perimeters against weather barrier and/or roofing.
 - 2. Interlock bottom edge of roof edge flashing with continuous cleats anchored to substrate at minimum 8 inch centers.
- D. Coordinate installation of components of this section with installation of roofing membrane and base flashings.
- E. Coordinate installation of sealants and roofing cement with work of this section to ensure water tightness.

END OF SECTION

**SECTION 07 7200
ROOF ACCESSORIES**

PART 1 GENERAL V.22

1.01 SECTION INCLUDES

- A. Roof hatches.

1.02 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used.
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
 - 4. Maintenance requirements.
- C. Shop Drawings: Submit detailed layout developed for this project and provide dimensioned location and number for each type of roof accessory.
 - 1. Non-penetrating Rooftop Supports: Submit design calculations for loadings and spacings.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store products under cover and elevated above grade.

PART 2 PRODUCTS

2.01 ROOF HATCHES

- A. Roof Hatch Manufacturers:
 - 1. Acudor Products Inc; Galvanized Steel Roof Hatch: www.acudor.com/#sle.
 - 2. Bilco Company; Type TB (various types and special size): www.bilco.com/#sle.
 - 3. Substitutions: See Section 01 6000 - Product Requirements.
- B. Roof Hatches and Smoke Vents: Factory-assembled aluminum frame and cover, complete with operating and release hardware.
 - 1. Style: Provide flat metal covers unless otherwise indicated.
 - 2. Mounting Substrate: Provide frames and curbs suitable for mounting on standing seam metal roof panel system.
 - 3. For Ladder Access: Single leaf; 30 by 36 inches.
 - 4. For Ships Ladder Access: Single leaf; 30 by 54 inches.
- C. Frames and Curbs: One-piece curb and frame with integral cap flashing to receive roof flashings; extended bottom flange to suit mounting.
 - 1. Material: Stainless steel, Type 304, 14 gage, 0.0747 inch thick.
 - 2. Finish: Factory prime paint.
 - 3. Insulation: Manufacturer's standard; 1 inch rigid glass fiber, located on outside face of curb.
 - 4. Curb Height: 12 inches from finished surface of roof, minimum.
- D. Metal Covers: Flush, insulated, hollow metal construction.
 - 1. Capable of supporting 40 psf live load.
 - 2. Material: Galvanized steel; outer cover 14 gage, 0.0747 inch thick, liner 22 gage, 0.03 inch thick.
 - 3. Finish: Factory prime paint.
 - 4. Insulation: Manufacturer's standard 1 inch rigid glass fiber.
 - 5. Gasket: Neoprene, continuous around cover perimeter.
- E. Safety Railing System: Manufacturer's standard accessory safety rail system mounted directly to curb.

1. Comply with 29 CFR 1910.23, with a safety factor of two.
 2. Posts and Rails: Aluminum tube.
 3. Gate: Same material as railing; automatic closing with latch.
 4. Finish: Manufacturer's standard, factory applied finish.
 5. Mounting Brackets: Hot dipped galvanized steel, 1/4 inch thick, minimum.
 6. Fasteners: Stainless steel, Type 316.
 7. Manufacturers:
 - a. BILCO Company; Bil-Guard 2.0: www.bilco.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- F. Hardware: Steel, zinc coated and chromate sealed, unless otherwise indicated or required by manufacturer.
1. Lifting Mechanisms: Compression or torsion spring operator with shock absorbers that automatically opens upon release of latch; capable of lifting covers despite 10 psf load.
 2. Hinges: Heavy duty pintle type.
 3. Hold open arm with vinyl-coated handle for manual release.
 4. Latch: Upon closing, engage latch automatically and reset manual release.
 5. Manual Release: Pull handle on interior.
 6. Locking: Padlock hasp on interior.
- G. Ladder Safety Post: Manufacturer's standard accessory ladder safety post extension to extend 42 inches above a landing platform with spring assisted telescoping design.
1. Post: Powder coated steel, safety yellow color.
 2. Accessories: As required for a complete installation.
 3. Provide at all roof hatches with vertical fixed ladder below.
 4. Manufacturers:
 - a. Babock-Davis Inc.; Model BSP: www.babockdavis.com.
 - b. Substitutions: See Section 01 6000 - Product Requirements

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using methods recommended by manufacturer for achieving acceptable results for applicable substrate under project conditions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions, in manner that maintains roofing system weather-tight integrity.

3.04 CLEANING

- A. Clean installed work to like-new condition.

3.05 PROTECTION

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

END OF SECTION

**SECTION 07 8400
FIRESTOPPING**

PART 1 GENERAL V.20

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.

1.02 REFERENCE STANDARDS

- A. FM (AG) - FM Approval Guide; current edition.
- A. ITS (DIR) - Directory of Listed Products; current edition.
- B. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition.
- C. UL (FRD) - Fire Resistance Directory; current edition.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Schedule of Firestopping: List each type of penetration, locations of all rated walls with type of fire stopping system proposed, fire rating of the penetrated assembly, locations of all rated walls with type of fire stopping system proposed, firestopping test or design number, and locations of all rated walls with type of fire stopping system proposed.
- C. Product Data: Provide data on product characteristics, performance ratings, and limitations.
- D. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
- E. Certificate from authority having jurisdiction indicating approval of materials used.
- F. Installer Qualification: Submit qualification statements for installing mechanics.

1.04 QUALITY ASSURANCE

- A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
 - 1. Listing in UL (FRD), FM (AG), or ITS (DIR) will be considered as constituting an acceptable test report.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section and:
 - 1. Verification of minimum three years documented experience installing work of this type.

1.05 MOCK-UP

- A. Install one firestopping assembly representative of each fire rating design required on project.
- B. If accepted, mock-up may remain and represent minimum standard of the Work. Remove and replace mock-ups not accepted.

1.06 FIELD CONDITIONS

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Firestopping Materials: Any materials meeting requirements.
- B. Prohibited Materials: Do not use any product that contains asbestos..

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

2.02 FIRESTOPPING SYSTEMS

- A. Firestopping: Any material meeting requirements.
- B. Firestopping at Uninsulated Metallic Pipe and Conduit Penetrations, of diameter 4 inches or less: Caulk or putty.
- C. Firestopping at Combustible Pipe and Conduit Penetrations, of diameter 4 inches or less: Any material meeting requirements.
- D. Firestopping at Cable Tray Penetrations: Any material meeting requirements.
- E. Firestopping at Cable Penetrations, not in Conduit or Cable Tray: Any material meeting requirements.
- F. Firestopping at Control Joints (without Penetrations): Any material meeting requirements.
- G. Firestopping Between Edge of Floor Slab and Curtain Wall: Fiber firestopping with smoke seal coating.
- H. Firestopping Between Top of Partition Wall and Roof Slab: Fiber firestopping with smoke seal coating.
- I. Temporary Firestopping: Reusable intumescent shapes.

2.03 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.
 - 1. Color: Dark Grey or Red
 - 2. Manufacturers:
 - a. A/DFire 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.
- C. Foam Firestopping: Single component silicone foam compound.
 - 1. Color: Dark Grey or Red.
 - 2. 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.
 - 1. Color: Dark Grey.
 - 2. Manufacturers:
 - a. A/DFire Protection Systems Inc: www.adfire.com.
 - b. USG: www.usg.com.
- E. Fiber Firestopping: Mineral fiber insulation used in conjunction with elastomeric surface sealer forming airtight bond to opening.
 - 1. Manufacturers:
 - a. A/DFire Protection Systems Inc: www.adfire.com.
 - b. Pecora Corporation: www.pecora.com.
 - c. Thermafiber, Inc: www.thermafiber.com.

- F. Firestop Devices - Wrap Type: Mechanical device with incombustible filler and sheet stainless steel jacket, 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.
- G. Firestop Devices - Cast-In Type: Sleeve and sealing material, intended to be cast in concrete floor forms or in concrete on metal deck, not requiring any additional materials to achieve penetration seal.
 - 1. Manufacturers:
 - a. 3M Fire Protection Products: www.3m.com/firestop.
 - b. Hilti, Inc: www.us.hilti.com.
 - c. Substitutions: See Section 01 6000 - Product Requirements.
- H. Intumescent Putty: Compound that expands on exposure to surface heat gain; conforming to the following:
 - 1. Potential Expansion: Minimum 1000 percent.
 - 2. Color: Red.
 - 3. 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.
- I. Reusable Firestopping: Removable intumescent compressible shapes, pillows, or blocks specifically tested in removable configuration.
 - 1. Manufacturers:
 - a. RectorSeal: www.rectorseal.com.
 - b. Hilti, Inc: www.us.hilti.com.
 - c. Nelson FireStop Products: www.nelsonfirestop.com.
 - d. Specified Technologies, Inc: www.stifirestop.com.
- J. 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

**SECTION 07 9200
JOINT SEALANTS**

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

- A. Nonsag gunnable joint sealants.
- B. Self-leveling pourable joint sealants.
- C. Joint backings and accessories.

1.02 REFERENCE STANDARDS

- A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2006 (Reapproved 2011).
- B. ASTM C834 - Standard Specification for Latex Sealants; 2014.
- C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.
- D. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.
- E. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2008 (Reapproved 2012).
- F. ASTM C1311 - Standard Specification for Solvent Release Sealants; 2014.
- G. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2002 (Reapproved 2013).
- H. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints; 2013.
- I. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2005 (Reapproved 2010).
- J. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition.

1.03 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. Sample product warranty.
- C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
- D. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
- E. Field Quality Control Plan: Submit at least two weeks prior to start of installation.
- F. Field Quality Control Log: Submit filled out log for each length or instance of sealant installed, within 10 days after completion of inspections/tests; include bagged test samples and photographic records, if any.

1.04 MOCK UP

- A. Provide mock-up of sealant joints in conjunction with wall and air barrier system.

- B. Construct mock-up with specified sealant types and with other components noted.
- C. Locate where directed. Mockup may remain as part of the Work.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.
- C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.
- D. Field Quality Control Plan:
 - 1. Visual inspection of entire length of sealant joints.
 - 2. Destructive field adhesion testing of sealant joints, except interior acrylic latex sealant.
 - a. For each different sealant and substrate combination, allow for one test every 100 feet in the first 1000 linear feet, and one test per 1000 linear feet thereafter, or once per floor on each elevation.
 - b. If any failures occur in the first 1000 linear feet, continue testing at frequency of one test per 500 linear feet at no extra cost to Owner.
 - 3. Field testing agency's qualifications.
- E. Field Adhesion Test Procedures:
 - 1. Allow sealants to fully cure as recommended by manufacturer before testing.
 - 2. Record the type of failure that occurred, other information required by test method, and the information required on the Field Quality Control Log.
 - 3. When performing destructive tests, also inspect the opened joint for proper installation characteristics recommended by manufacturer, and report any deficiencies.
 - 4. Deliver the samples removed during destructive tests in separate sealed plastic bags, identified with project, location, test date, and test results, to Owner.
 - 5. If any combination of sealant type and substrate does not show evidence of minimum adhesion or shows cohesion failure before minimum adhesion, report results to Architect.
- F. Destructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Destructive Tail Procedure.
 - 1. Sample: At least 18 inches long.
 - 2. Minimum Elongation Without Adhesive Failure: Consider the tail at rest, not under any elongation stress; multiply the stated movement capability of the sealant in percent by two; then multiply 1 inch by that percentage; if adhesion failure occurs before the "1 inch mark" is that distance from the substrate, the test has failed.
 - 3. If either adhesive or cohesive failure occurs prior to minimum elongation, take necessary measures to correct conditions and re-test; record each modification to products or installation procedures.

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 MANUFACTURERS

- A. Non-Sag Sealants: Permits application in joints on vertical surfaces without sagging or slumping.
 - 1. Dow Corning Corporation: www.dowcorning.com/construction/#sle.
 - 2. Momentive Performance Materials, Inc (formerly GE Silicones): www.momentive.com.

3. Pecora Corporation: www.pecora.com.
 4. Sherwin-Williams Company: www.sherwin-williams.com.
 5. Sika Corporation: www.usa-sika.com.
 6. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
- B. Self-Leveling Sealants: Pourable or self-leveling sealant that has sufficient flow to form a smooth, level surface when applied in a horizontal joint.
1. Dow Corning Corporation: www.dowcorning.com/construction/#sle.
 2. Master Builders Solutions by BASF: www.master-builders-solutions.basf.us/en-us/#sle.
 3. Pecora Corporation: www.pecora.com.
 4. Sherwin-Williams Company: www.sherwin-williams.com.
 5. Sika Corporation: www.usa-sika.com.
 6. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.

2.02 JOINT SEALANT APPLICATIONS

- A. Scope:
1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
 - a. Wall expansion and control joints.
 - b. Joints between door, window, and other frames and adjacent construction.
 - c. Joints between different exposed materials.
 - d. Openings below ledge angles in masonry.
 - e. Other joints indicated below.
 2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
 - a. Joints between door, window, and other frames and adjacent construction.
 - b. 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.
1. Lap Joints in Sheet Metal Fabrications: Butyl rubber, non-curing; Type H.
 2. Lap Joints between Manufactured Metal Panels: Butyl rubber, non-curing; Type H.
 3. Butt Joints in Exterior Metal Work and Siding: Acrylic Emulsion; Type G.
 4. Joints between concrete panels and between panels of adjacent work:
 5. Joints between masonry and cast stone: Type U with sand.
- C. Interior Joints: Use non-sag polyurethane sealant, unless otherwise indicated.
1. Wall and Ceiling Joints in Non-Wet Areas: Acrylic emulsion latex sealant.
 2. Floor Joints in Wet Areas: Non-sag polyurethane "non-traffic-grade" sealant suitable for continuous liquid immersion.
 3. Joints between Fixtures in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; white.
 4. Other Floor Joints: Self-leveling polyurethane "traffic-grade" sealant.
- D. Interior Wet Areas: Bathrooms, restrooms, kitchens, food service areas, and food processing areas; fixtures in wet areas include plumbing fixtures, food service equipment, countertops, cabinets, and other similar items.

2.03 NONSAG JOINT SEALANTS

- A. Type U-1 - 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 100 percent, 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.
 - 4. Color: Match adjacent finished surfaces.
 - 5. Cure Type: Single-component, neutral moisture curing.
 - 6. Service Temperature Range: Minus 20 to 180 degrees F.
 - 7. Manufacturers:
 - a. Dow Chemical Company; DOWSIL 795 Silicone Building Sealant: consumer.dow.com/en-us/industry/ind-building-construction.html/#sle.
 - b. Pecora Corporation: www.pecora.com.
 - c. Substitutions: See Section 01 6000 - Product Requirements.
- B. Type U-2 - 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 25 percent, minimum.
 - 2. Hardness Range: 15 to 35, Shore A, when tested in accordance with ASTM C661.
 - 3. Color: Match adjacent finished surfaces.
 - 4. Cure Type: Single-component, neutral moisture curing
 - 5. Service Temperature Range: Minus 65 to 180 degrees F.
 - 6. Manufacturers:
 - a. Dow Chemical Company; DOWSIL 999-A Building and Glazing Sealant: consumer.dow.com/en-us/industry/ind-building-construction.html/#sle.
 - b. Pecora Corporation: www.pecora.com.
 - c. Substitutions: See Section 01 6000 - Product Requirements.
- C. Type E - Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
 - 1. Color: White.
 - 2. Manufacturers:
 - a. Pecora Corporation: www.pecora.com.
- D. Type A - 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. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
 - 3. Color: To be selected by Architect from manufacturer's standard range.
 - 4. Service Temperature Range: Minus 40 to 180 degrees F.
 - 5. Manufacturers:
 - a. Pecora Corporation: www.pecora.com.
 - b. Sherwin-Williams Company; Stampede-1/-TX Polyurethane Sealant: www.sherwin-williams.com/#sle.
 - c. BASF Corporation; MasterSeal NP1, One component polyurethane sealant. www.master-builders-solutions.basf.us
 - d. Substitutions: See Section 01 6000 - Product Requirements.
- E. Type J - Polyurethane Sealant for Continuous Water Immersion: ASTM C920, Grade NS, Uses M and A; single or multi-component; explicitly approved by manufacturer for continuous water immersion; suitable for traffic exposure when recessed below traffic surface .
 - 1. Movement Capability: Plus and minus 35 percent, minimum.
 - 2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
 - 3. Color: To be selected by Architect from manufacturer's standard range.

4. Service Temperature Range: Minus 40 to 180 degrees F.
 5. Manufacturers:
 - a. Sika Corporation; Sikaflex-1a: www.usa-sika.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- F. Type B - Non-Sag "Traffic-Grade" Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; explicitly approved by manufacturer for continuous water immersion and traffic without the necessity to recess sealant below traffic surface.
1. Movement Capability: Plus and minus 25 percent, minimum.
 2. Hardness Range: 40 to 50, Shore A, when tested in accordance with ASTM C661.
 3. Color: To be selected by Architect from manufacturer's standard range.
- G. Type G - Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.
1. Color: Standard colors matching finished surfaces, Type OP (opaque).
 2. Manufacturers:
 - a. Pecora Corporation: www.pecora.com.
 - b. Sherwin-Williams Company; 850A Acrylic Latex Caulk: www.sherwin-williams.com/#sle.
 - c. Sherwin-Williams Company; 950A Siliconized Acrylic Latex Caulk: www.sherwin-williams.com/#sle.
- H. Type C - Butyl Sealant: Solvent-based; ASTM C1311; single component, nonsag; not expected to withstand continuous water immersion or traffic.
1. Hardness Range: 10 to 30, Shore A, when tested in accordance with ASTM C661.
 2. Color: To be selected by Architect from manufacturer's standard range.
 3. Service Temperature Range: Minus 13 to 180 degrees F.
 4. Manufacturers:
 - a. Sherwin-Williams Company; Storm Blaster All Season Sealant: www.sherwin-williams.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- I. Type H - Non-Curing Butyl Sealant: Solvent-based; ASTM C1311; single component, non-sag, non-skinning, non-hardening, non-bleeding; vapor-impermeable; intended for fully concealed applications.
1. Manufacturers:
 - a. Pecora Corporation; Pecora BA-98 Non-Skinning Butyl Sealant: www.pecora.com/#sle.

2.04 SELF-LEVELING SEALANTS

- A. Type F - Self-Leveling Polyurethane Sealant: ASTM C920, Grade P, Uses M and A; single or multi-component; explicitly approved by manufacturer for traffic exposure; not expected to withstand continuous water immersion .
1. Movement Capability: Plus and minus 25 percent, minimum.
 2. Hardness Range: 35 to 55, Shore A, when tested in accordance with ASTM C661.
 3. Color: Grey.
 4. Service Temperature Range: Minus 40 to 180 degrees F.
 5. Manufacturers:
 - a. Sherwin-Williams Company; Stampede 1SL Polyurethane Sealant: www.sherwin-williams.com/#sle.
 - b. Sika Corporation; Sikaflex-1c SL: www.usa-sika.com/#sle.
- B. Type P - Semi-Rigid Self-Leveling Polyurea Joint Filler: Two-component, 100 percent solids; intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic. Joint filler for areas to receive polished concrete finish. Confirm material with system manufacturer / installer.

1. Durometer Hardness, Type A: 75, minimum, after seven days when tested in accordance with ASTM D2240.
2. Color: To be selected by Architect from manufacturer's standard colors.
3. Joint Width, Maximum: 3/4 inch.
4. Manufacturers:
 - a. ARDEX Engineered Cements; ARDEX ARDISEAL RAPID PLUS: www.ardexamericas.com/#sle.
 - b. Euclid Chemical Company; EUCO QWIKjoint UVR: www.euclidchemical.com/#sle.
 - c. Nox-Crete Inc; DynaFlex JF-85: www.nox-crete.com/#sle.

2.05 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.
- F. Sand: White or tan sand, selection based on field mockup.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

3.03 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. 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.
- G. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

3.04 FIELD QUALITY CONTROL

- A. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.
- B. Destructive Adhesion Testing: If there are any failures in first 1000 linear feet, notify Architect immediately.
- C. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.
- D. Repair destructive test location damage immediately after evaluation and recording of results.

END OF SECTION

**SECTION 08 1113
HOLLOW METAL DOORS AND FRAMES**

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

- A. Non-fire-rated hollow metal doors and frames.
- B. Hollow metal frames for wood doors.
- C. Fire-rated hollow metal doors and frames.
- D. Thermally insulated hollow metal doors with frames.
- E. Sound-rated hollow metal doors and frames.
- F. Accessories, including glazing, louvers, and matching panels.

1.02 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2011.
- C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2014.
- D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2011.
- E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2015.
- G. 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; 2014.
- H. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009.
- I. ASTM E413 - Classification for Rating Sound Insulation; 2010.
- J. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2014.
- K. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2009.
- L. ITS (DIR) - Directory of Listed Products; current edition.
- M. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.
- N. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.
- O. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; 2007.
- P. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2016.
- Q. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2012.
- R. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.
- S. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.03 SUBMITTALS

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

- B. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.
- C. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.
- D. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.
- E. Manufacturer's Qualification Statement.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.
- B. Maintain at project site copies of reference standards relating to installation of products specified.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Hollow Metal Doors and Frames:
 1. Assa Abloy Ceco, Curries or Flemming; www.assaabloydss.com
 2. Steelcraft, an Allegion brand; _____: www.allegion.com/#sle.
 3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

- A. Requirements for Hollow Metal Doors and Frames:
 1. Steel Sheet: Comply with one or more of the following requirements; 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.
 2. Accessibility: Comply with ICC A117.1 and ADA Standards.
 3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
 4. Door Edge Profile: Beveled, both sides.
 5. Typical Door Face Sheets: Flush.
 6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturers standard.
 7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
 8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvanized) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
- B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

- A. Type ____, Exterior Doors: Thermally insulated.

1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 3 - Extra Heavy-duty.
 - b. Physical Performance Level A 1 000 000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 2 - Seamless.
 - d. Door Face Metal Thickness: 16 gage, 0.053 inch, minimum, not less than level specified.
 2. Core Material: Polystyrene, 1 lbs/cu ft minimum density.
 3. Door Thermal Resistance: R-Value of 9.9, minimum, for installed thickness of polyisocyanurate. U-Value of 0.50 minimum.
 4. Door Thickness: 1-3/4 inch, nominal.
 5. Weatherstripping: Refer to Section 08 7100.
- B. Type ____, Interior Doors, Non-Fire-Rated:
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.
 - c. Model 2 - Seamless.
 - d. Door Face Metal Thickness: 18 gage, 0.042 inch, minimum, not less than level specified.
 2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
 3. Door Thickness: 1-3/4 inch, nominal.
- C. Type ____, Fire-Rated Doors:
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.
 - c. Model 2 - Seamless.
 - d. Door Face Metal Thickness: 18 gage, 0.042 inch, minimum, not less than level specified.
 2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
 - a. Provide units listed and labeled by UL (DIR) or ITS (DIR).
 - b. Attach fire rating label to each fire rated unit.
 3. Door Core Material: Manufacturers standard core material/construction in compliance with requirements.
 4. Door Thickness: 1-3/4 inch, nominal.
- D. Type ____, Sound-Rated Interior Doors:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 3 - Extra Heavy-duty.
 - b. Physical Performance Level A 1 000 000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 2 - Seamless.
 - d. Door Face Metal Thickness: 16 gage, 0.053 inch, minimum, not less than level specified.
 2. Sound Transmission Class (STC) Rating of Door and Frame Assembly: STC of 39, minimum, calculated in accordance with ASTM E413, and tested in accordance with ASTM E90.
 3. Door Core Material: Manufacturer's standard construction as required to meet acoustic requirements indicated.
 4. Door Thickness: As required to meet acoustic requirements indicated.
 5. Sound Seals: Refer to Section 08 7100.

2.04 HOLLOW METAL FRAMES

- A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
- B. Frame Finish: Factory primed and field finished.
- C. Exterior Door Frames: Fully welded.
 - 1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness.
 - 2. Frame Metal Thickness: 14 gage, 0.067 inch, minimum.
 - 3. Weatherstripping: Separate, see Section 08 7100.
- D. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
 - 1. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.
- E. Door Frames, Fire-Rated: Fully welded type.
 - 1. Fire Rating: Same as door, labeled.
- F. Sound-Rated Door Frames: Fully welded type.
- G. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
- H. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inch high to fill opening without cutting masonry units.
- I. Frames Wider than 48 inches: Reinforce with steel channel fitted tightly into frame head, flush with top.
- J. Frame width to extend past face of wall or partition on either sides, unless noted or detailed otherwise.

2.05 FINISHES

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

2.06 ACCESSORIES

- A. Glazing: As specified in Section 08 8000.
- B. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.
- C. Astragals for Double Doors: Specified in Section 08 7100.
 - 1. Exterior Doors: Steel, Z-shaped.
 - 2. Fire-Rated Doors: Steel, shape as required for fire rating.
- D. Grout for Frames: Portland cement grout with maximum 4 inch slump for hand troweling; thinner pumpable grout is prohibited.
- E. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.
- F. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 INSTALLATION

- A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
- B. Install fire rated units in accordance with NFPA 80.

- C. Coordinate frame anchor placement with wall construction.
- D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
- E. Install door hardware as specified in Section 08 7100.
- F. Comply with glazing installation requirements of Section 08 8000.
- G. Coordinate installation of electrical connections to electrical hardware items.
- H. Touch up damaged factory finishes.

3.03 TOLERANCES

- A. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.04 ADJUSTING

- A. Adjust for smooth and balanced door movement.
- B. Adjust sound control doors so that seals are fully engaged when door is closed.

3.05 SCHEDULE

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

END OF SECTION

**SECTION 08 1416
FLUSH WOOD DOORS**

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

- A. Flush wood doors; flush and flush glazed configuration; fire rated, non-rated, acoustical, and special function.

1.02 REFERENCE STANDARDS

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.
- B. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009.
- C. ASTM E413 - Classification for Rating Sound Insulation; 2010.
- D. AWI (QCP) - Quality Certification Program; current edition at www.awiqcp.org.
- E. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.
- F. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.0; 2016.
- G. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2016.
- H. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2012.
- I. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- J. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
 - 1. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
- D. Samples: Submit two samples of door construction, 8 x 8 inch in size cut from top corner of door.
- E. Samples: Submit two samples of door veneer, 8 x 8 inch in size illustrating wood grain, stain color, and sheen. Submit stain color selection kit for available factory finishes.
- F. Certificate: Submit labels and certificates required by quality assurance and quality control programs.
- G. Test Reports: Show compliance with specified requirements for the following:
 - 1. Sound-retardant doors and frames; sealed panel tests are not acceptable.
- H. Manufacturer's Installation Instructions: Indicate special installation instructions.
- I. Specimen warranty.
- J. Warranty, executed in Owner's name.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.
 - 1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
- 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.
3. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Package, deliver and store doors in accordance with specified quality standard.
- B. Accept doors on site in manufacturer's packaging. Inspect for damage.
- C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

1.06 WARRANTY

- A. See Section 01 7800 - CLOSEOUT SUBMITTALS, for additional warranty requirements.
- B. Interior Doors: Provide manufacturer's warranty for the life of the installation.
- C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Wood Veneer Faced Doors:
 1. Graham Wood Doors: www.grahamdoors.com.
 2. Marshfield DoorSystems, Inc: www.marshfielddoors.com/#sle.
 3. VT Industries, Inc: www.vtindustries.com/#sle.
 4. Masonite Architectural Doors; <http://architectural.masonite.com>.
 5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DOORS AND PANELS

- A. Doors: Refer to drawings for locations and additional requirements.
 1. Quality Standard: Custom Grade, Standard Duty performance, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
 2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
- B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
 1. Provide solid core doors at each location.
 2. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with 16 CFR 1201 - Negative (Neutral) Pressure; Underwriters Laboratories Inc. (UL) or Intertek/Warnock Hersey (WHI) labeled without any visible seals when door is open.
 3. Sound Retardant Doors: Minimum STC of 41, calculated in accordance with ASTM E413, tested in accordance with ASTM E90.
 4. Wood veneer facing with factory transparent finish.

2.03 DOOR AND PANEL CORES

- A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.
- B. Fire-Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.
- C. Sound Retardant Doors: Equivalent to Type particleboard core (PC) construction with core as required to achieve STC rating specified; plies and faces as indicated.

2.04 DOOR FACINGS

- A. Veneer Facing for Transparent Finish: White oak, HPVA Grade A, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face; unless otherwise indicated.
- B. Facing Adhesive: Type I - waterproof.

2.05 DOOR CONSTRUCTION

- A. Fabricate doors in accordance with door quality standard specified.
- B. Cores Constructed with stiles and rails:
 - 1. Provide solid blocks at lock edge for hardware reinforcement.
 - 2. Provide solid blocking for other throughbolted hardware.
- C. 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.
 - 1. Exception: Doors to be field finished.
- E. Provide edge clearances in accordance with the quality standard specified.

2.06 FACTORY FINISHING - WOOD VENEER DOORS

- A. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
 - 1. Transparent, Premium Quality:
 - a. System - 5, Varnish, Conversion.
 - b. Stain: As selected by Architect.
 - c. Sheen: to be selected.
- B. Factory finish doors in accordance with approved sample.
- C. Seal door top edge with color sealer to match door facing.

2.07 PREHUNG DOOR

- A. Profile: Single Door.
- B. Jamb Width: Per wall type, contractor to verify.
- C. Jamb Type: Rabbeted.
- D. Jamb Species: White Oak, Stain Grade.
- E. Hinges: SAE 1010 Carbon Steel.
 - 1. Size: 4 inch by 4 inch ball bearing with 5/8 inch radius corner.
 - 2. Finish: TBD

2.08 ACCESSORIES

- A. Glazing Stops: Wood, of same species as door facing, butted corners; prepared for countersink style tamper proof screws.
- B. Astragals for Non-Rated Double Doors: Steel, T shaped, overlapping and recessed at face edge.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
 - 1. Install fire-rated doors in accordance with NFPA 80 requirements.
- B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
- C. Use machine tools to cut or drill for hardware.
- D. Coordinate installation of doors with installation of frames and hardware.
- E. Coordinate installation of glazing.

3.03 TOLERANCES

- A. Conform to specified quality standard for fit, clearance tolerances, telegraphing, warp and squareness.

3.04 ADJUSTING

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

END OF SECTION

**SECTION 08 3100
ACCESS DOORS AND PANELS**

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

- A. Wall mounted access units.
- B. Ceiling mounted access units.

1.02 RELATED REQUIREMENTS

- A. See Fire Protection, Plumbing, Mechanical, Electrical, and other associated trades for components located above hard lid ceilings and within walls that may require access panels to reach them. Locations may not be visually shown on drawings but where device is installed and concealed an access panels must be provided. It is encouraged to locate device, valve, etc. in location accessible to avoid installation of access panel. GC responsible to coordinate panel locations among trades to reduce quantity and verify acceptability with Architect.

1.03 REFERENCE STANDARDS

- A. ITS (DIR) - Directory of Listed Products; current edition.
- B. UL (FRD) - Fire Resistance Directory; current edition.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.

PART 2 PRODUCTS

2.01 ACCESS DOORS AND PANELS ASSEMBLIES

- A. Wall-Mounted Units:
 - 1. Panel Material: Steel.
 - 2. Size: 12 inch by 12 inch, minimum or as required to permit access. Coordinate size with other trades access panel is used for.
 - 3. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
 - 4. Gypsum Board Mounting Criteria: Provide drywall bead frame with door surface flush with wall surface.
- B. Fire-Rated Wall-Mounted Units:
 - 1. Wall Fire-Rating: As indicated on drawings.
 - 2. Panel Material: Steel.
 - 3. Size: 12 inch by 12 inch., minimum or as required to permit access. Coordinate size with other trades access panel is used for.
- C. Fire-Rated Ceiling-Mounted Units:
 - 1. Ceiling Fire-Rating: As indicated on drawings.
 - 2. Panel Material: Steel.
 - 3. Size: 12 inch by 12 inch., minimum, or as required to permit access. Coordinate size with other trades access panel is used for.

2.02 WALL AND CEILING MOUNTED ACCESS UNITS

- A. Manufacturers:
 - 1. ACUDOR Products Inc: www.acudor.com/#sle.
 - 2. Cendrex, Inc: www.cendrex.com/#sle.
 - 3. J.L. Industries Inc: www.activarcpg.com/jl-industries
 - 4. Milcor, Inc: www.milcorinc.com/#sle.
 - 5. Substitutions: See Section 01 6000 - Product Requirements.

- B. Wall and Ceiling Mounted Units: Factory fabricated door and frame, fully assembled units with corner joints welded, filled and ground flush; square and without rack or warp; coordinate requirements with type of installation assembly being used for each unit.
 - 1. Door Style: Single thickness with rolled or turned in edges.
 - 2. Frames: 16 gage, 0.0598 inch, minimum thickness.
 - 3. Single Steel Sheet Door Panels: 1/16 inch, minimum thickness.
 - 4. Units in Fire-Rated Assemblies: Fire rating as required by applicable code for fire-rated assembly that access doors are being installed.
 - a. Provide products listed by ITS (DIR) or UL (FRD) as suitable for purpose indicated.
 - b. Provide certificate of compliance from authorities having jurisdiction indicating approval of fire rated doors.
 - 5. Steel Finish: Primed.
 - 6. Primed and Factory Finish: Polyester powder coat; color manufacturer's standard.
 - 7. Hardware:
 - a. Hardware for Fire-Rated Units: As required for listing.
 - b. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that rough openings are correctly sized and located.

3.02 INSTALLATION

- A. Install units in accordance with manufacturer's instructions.
- B. Drawings do not show all access panels and Contractor is responsible to provide all access panels as required for a complete installation.
- C. Coordinate installation locations with other trades (Mechanical, Electrical, etc.) to ensure proper size is provided to allow access to items beyond access panel. Adjust size as necessary to accommodate access. Locate and install additional access panels as needed.
- D. Locate devices that require access above lay-in acoustical ceilings when possible. Provide access panel where necessary when behind gypsum board walls / ceilings.
- E. Install frames plumb and level in openings, and secure units rigidly in place.
- F. Position units to provide convenient access to concealed equipment when necessary.
- G. Field paint access panels where necessary to match adjacent finishes.

END OF SECTION

**SECTION 08 4229
AUTOMATIC ENTRANCES**

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

- A. Operators for doors provided in other sections.
- B. Controllers, actuators and safety devices.
- C. Maintenance.

1.02 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- B. BHMA A156.10 - American National Standard for Power Operated Pedestrian Doors; 2011.
- C. ITS (DIR) - Directory of Listed Products; current edition.
- D. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- E. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.
- F. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
 - 1. Indicate layout and dimensions; head, jamb, and sill conditions; elevations; components, anchorage, recesses, materials, and finishes, electrical characteristics and connection requirements.
 - 2. Identify installation tolerances required, assembly conditions, routing of service lines and conduit, and locations of operating components and boxes.
- C. Product Data: Provide data on system components, sizes, features, and finishes.
- D. Manufacturer's Qualification Statement.
- E. Installer's Qualification Statement.
- F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience, and a member of AAADM.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience and approved by manufacturer.

1.05 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. Provide two year manufacturer warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Swinging Automatic Entrance Door Assemblies:
 - 1. ASSA ABLOY Entrance Solutions; Besam SW200i: www.besam-usa.com/#sle.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.
- B. Door Operators for Swing Doors Specified in Other Sections:

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1. ASSA ABLOY Entrance Solutions; Besam SW200i - IG: www.besam-usa.com/#sle.
2. DORMA USA, Inc; ED100: www.dorma.com/#sle.
3. LCN, an Allegion brand: www.allegion.com/us/#sle.
4. Horton Automatics: www.hortondoors.com/#sle.
5. Stanley Access Technologies; Magic Access LE (Low Energy): www.stanleyaccess.com/#sle.
6. Substitutions: See Section 01 6000 - Product Requirements.

2.02 POWER OPERATED DOORS

- A. Power Operated Doors: Provide products that comply with NFPA 101 and requirements of authorities having jurisdiction; provide equipment selected for actual door weight and for light pedestrian traffic, unless otherwise indicated.
 1. Swinging Door Operators: Fully adjustable for opening and closing speeds, checking speeds, and hold-open time; in the event of power failure, disengage operator allowing door to function as a door with a spring closer.
 2. Packaged Door Assemblies: Provide components by single manufacturer, factory-assembled, including doors, frames, operators, actuators, and safeties.
- B. Swinging Doors with Full Power Operators: Comply with BHMA A156.10; safeties required.
 1. Comply with UL 325; acceptable evidence of compliance includes UL (DIR) or ITS (DIR) listing or test report by testing agency acceptable to authorities having jurisdiction.
 2. Force Required to Set Door in Motion When Unpowered: 30 pound-force, maximum, measured at 1 inch from the latch edge of the door at any point in the closing cycle.

2.03 AUTOMATIC ENTRANCE DOOR ASSEMBLIES

- A. Comply with ADA Standards for egress requirements.
- B. Swinging Automatic Door: Single-acting hinged, electric operation, extruded aluminum glazed door, with extruded tubular frame, and operator concealed overhead.
 1. Push-Side Actuator: Push plate.
 2. Pull-Side Actuator: Push plate.
 3. Pull-Side Safety: Door-mounted.
 4. Door and Frame Finish: Same as adjacent framing system.

2.04 OPERATORS FOR SWINGING DOORS PROVIDED BY OTHERS

- A. Door Operator, Type DORMA, ED series, ED250: Electric, surface mounted overhead.
 1. Operation: Full-power open, spring close operation.
 2. Variable speed control for opening and closing cycles.
 3. Push-Side Actuator: Push plate.
 4. Pull-Side Actuator: Push plate.
 5. Pull-Side Safety: Door-mounted.
 6. Hold Open: Toggle switch at inside head of doors; deactivate hold-open on activation of fire alarm system, refer to Section 28 4600.

2.05 CONTROLLERS, ACTUATORS, AND SAFETIES

- A. Controller: Provide microprocessor operated controller for each door.
- B. Comply with BHMA A156.10 for actuator and safety types and zones.
- C. Proximity Detector Actuator/Safety: Microwave; distance of control sensitivity adjustable.
- D. Push Plate Actuator: Standard wall mounted, surface mounted momentary contact type; satin stainless steel plate; 4 inches diameter; labeled PUSH.
- E. Swinging Door Safety Device: Door-mounted proximity detector device arranged to prevent operation of door when persons or obstructions are in the swing zone.

2.06 ACCESSORIES

- A. Steel Clips, Supports, and Steel Anchors: Galvanized to 1.25 oz/sq ft.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work and dimensions are as indicated on shop drawings.
- B. Verify that electric power is available and is of the correct characteristics.

3.02 INSTALLATION

- A. Install equipment in accordance with manufacturer's instructions.
- B. Provide for dimensional distortion of components during operation.
- C. Coordinate installation of components with related and adjacent work; level and plumb.
- D. Where provided, coordinate operation and wiring of Access Control (AC) card reader systems with push button actuators. At door locations provided with AC, Push button to be deactivated when AC system is active and in locked mode. Upon approved AC user authorization, push button becomes active for use. Coordinate required components with AC provider.

3.03 ADJUSTING

- A. Adjust door equipment for correct function and smooth operation.

3.04 CLEANING

- A. Remove temporary protection, clean exposed surfaces.

3.05 CLOSEOUT ACTIVITIES

- A. Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.06 MAINTENANCE

- A. Provide service and maintenance of operating equipment for one year from Date of Substantial Completion, at no extra charge to Owner.

END OF SECTION

**SECTION 08 4313
ALUMINUM-FRAMED STOREFRONTS**

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

- A. Aluminum-framed storefront, with insulated glass units installed at exterior openings of building envelope.
- B. Aluminum-framed storefront, with single pane glass installed in interior partitions.
- C. Aluminum entrance doors and frames with insulated glass units installed at exterior openings in building envelope.
- D. Aluminum entrance doors and frames with single pane glass installed at interior storefront systems.
- E. Door hardware, weatherstripping and accessories for a storefront installation.

1.02 REFERENCE STANDARDS

- A. AAMA 501.2 - Field Check of Metal Storefronts, Curtain Walls, and Sloped Glazing Systems for Water Leakage; 2009.
- B. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2012.
- C. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2010, with 2013 Supplements and Errata.
- D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
- E. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- F. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- G. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.
- H. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- I. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.
- J. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).
- K. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.
- L. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with installation of other components that comprise the exterior enclosure.
- B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, internal drainage details.

- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required. Indicate method of installation for all components.
- D. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.
- E. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.
- F. Samples: Submit two samples 4x3 inches in size illustrating finished aluminum surface, glass, glazing materials.
- G. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
- H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State of Arkansas.
- B. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.06 FIELD CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.07 WARRANTY

- A. See Section 01 7800 - CLOSEOUT SUBMITTALS, for additional warranty requirements.
- B. Correct defective Work, including the watertightness of system, within a five year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
- D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Kawneer North America; Kawneer 451T. www.kawneer.com
- B. Other Acceptable - Aluminum-Framed Storefronts Manufacturers:
 1. Manko Window Systems, Inc: www.mankowindows.com/#sle.
 2. Oldcastle Building Envelope: www.oldcastlebe.com/#sle.
 3. Tubelite, Inc: www.tubeliteinc.com/#sle.
 4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 BASIS OF DESIGN -- FRAMING FOR INSULATING GLAZING

- A. Center-Set Style, Thermally-Broken:
 1. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.

2.03 BASIS OF DESIGN -- FRAMING FOR MONOLITHIC GLAZING

- A. Center-Set Style:
 1. Vertical Mullion Dimensions: 1-3/4 inches wide by 4-1/2 inches deep.

2.04 BASIS OF DESIGN -- SWINGING DOORS

- A. Medium Stile, Insulating Glazing, Thermally-Broken:

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ALUMINUM-FRAMED STOREFRONTS
DESIGN DEVELOPMENT

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1. Thickness: 1-3/4 inches.

2.05 ALUMINUM-FRAMED STOREFRONT

- A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
 1. Overall U-Value Including Glazing: _____, maximum.
 2. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
 3. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
 4. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
 5. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
 6. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glass and inner sheet of infill panel and heel bead of glazing compound.
- B. Performance Requirements:
 1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
 - a. Design Wind Loads: Comply with requirements of ASCE 7.
 2. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 8 psf.
 3. Air Leakage Laboratory Test: Maximum of 0.06 cu ft/min sq ft of wall area, when tested in accordance with ASTM E283 at 6.27 psf pressure differential across assembly.

2.06 COMPONENTS

- A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
 1. Framing members for interior applications need not be thermally broken.
 2. Glazing Stops: Flush.
 3. Sill Flashing: High performance, thermally broken sill flashing equal to Kawneer 451T-HP-037, that utilizes clip system for bottom sill member attachment to sill flashing.
 - a. Install end dams to sill flashing at each end of opening.
 4. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.
 5. Internall reinforce for Hardware attachments as Required.
- B. Swing Doors: Glazed aluminum, thermally broke at exterior locations.
 1. Thickness: 1-3/4 inches.
 2. Top Rail: 4 inches wide.
 3. Vertical Stiles: 4-1/2 inches wide. GC to verify width with provided hardware mounting requirements.
 4. Bottom Rail: 10 inches wide.
 5. Glazing Stops: Square.
 6. Finish: Same as storefront.
 7. Internal reinforcement for Hardware as Required.

2.07 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Sheet Aluminum: ASTM B209 (ASTM B209M).

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ALUMINUM-FRAMED STOREFRONTS
DESIGN DEVELOPMENT

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- C. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.
- D. Fasteners: Stainless steel.
- E. Exposed Flashings: Aluminum sheet, 20 gage, 0.032 inch minimum thickness; finish to match framing members.
- F. Concealed Flashings: 0.032 inch thick aluminum.
- G. Perimeter Sealant: Type A specified in Section 07 9005.
- H. Glass: As specified in Section 08 8000.

2.08 FINISHES

- A. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating not less than 0.7 mils thick.
- B. Color: Clear Anodized
- C. Touch-Up Materials: As recommended by coating manufacturer for field application.

2.09 HARDWARE

- A. Door Hardware: Storefront manufacturer's standard type to suit application.
 - 1. Finish on Hand-Contacted Items: per approved sample.
 - 2. For each door, include butt hinges, pivots, push handle, pull handle, exit device, narrow stile handle latch, closer, and other specified hardware, reference section 08 7100.. Where hardware is provided in other sections, coordinate installation requirements. Where other hardware is not specified, provide cylinder and keyway to match building system.
 - 3. Coordinate the installation of hardware with section 08 7100 and other applicable access control components.
- B. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.
- C. Rain Drip: Extruded aluminum to match framing system; located at all exterior doors were not covered above by awning or canopy.
- D. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.
- E. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; provide on all doors.
- F. Pivots: Center type; top and bottom.
 - 1. Provide on all doors.
- G. Push/Pull Set:
 - 1. Provide on all doors.

2.10 FABRICATION

- A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
- C. Prepare components to receive anchor devices. Fabricate anchors.
- D. Reinforce framing members for imposed loads.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.02 INSTALLATION

- A. Install wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
- D. Provide alignment attachments and shims to permanently fasten system to building structure.
- E. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
- F. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- G. Provide thermal isolation where components penetrate or disrupt building insulation.
- H. Install sill flashings in a full bed of sealant. Turn up ends and edges; seal to adjacent work to form water tight end dam.
- I. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing. Do not install screws into vertical leg/face of sill flashing.
- J. Coordinate attachment and seal of perimeter air and vapor barrier materials. Entire inside perimeter of window to be sealed to weather barrier.
- K. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- L. Set thresholds in full bed of sealant and secure.
- M. Install hardware using templates provided.
- N. Install glass and infill panels in accordance with Section 08 8000, using glazing method required to achieve performance criteria.
- O. Install perimeter sealant in accordance with Section 07 9005. Seal interior of window perimeter to weather barrier.
- P. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inch per 3 feet non-cumulative or 0.06 inch per 10 feet, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 FIELD QUALITY CONTROL

- A. Water-Spray Test: Provide water spray quality test of installed storefront components in accordance with AAMA 501.2 during construction process and before installation of interior finishes.
 - 1. Perform a minimum of two tests in each designated area as indicated on drawings.
 - 2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.

3.05 ADJUSTING

- A. Adjust operating hardware and sash for smooth operation.

3.06 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths, and take care to remove dirt from corners and to wipe surfaces clean.

C. Remove excess sealant by method acceptable to sealant manufacturer.

3.07 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

**SECTION 08 4413
GLAZED ALUMINUM CURTAIN WALLS**

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

- A. Aluminum-framed curtain wall system, with vision glazing, glass spandrel glazing panels and/or MCM panels installed at openings of the building exterior envelope.
- B. Column covers.
- C. Perimeter sealant.
- D. Firestopping between curtain wall and edge of floor slab.

1.02 REFERENCE STANDARDS

- A. AAMA 501.2 - Field Check of Metal Storefronts, Curtain Walls, and Sloped Glazing Systems for Water Leakage; 2009.
- B. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2012.
- A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2015.
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- D. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- E. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.
- F. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- G. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.
- H. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants; 2015.
- I. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).
- J. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.
- K. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).
- L. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with installation of other components that comprise the exterior enclosure.
- B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, internal drainage details, glazing, hardware, structural reinforcing members, and infill.
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, framing member types, structural reinforced members, anchorage locations, affected related

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GLAZED ALUMINUM CURTAIN WALLS

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DESIGN DEVELOPMENT

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Work, expansion and contraction joint location and details, glazing type locations, and field welding required.

- D. Samples: Submit two samples 4 by 3 inches in size illustrating finished aluminum surface, glazing, infill panels, and glazing materials.
- E. Test Reports: Submit results of full-size mock-up testing. Reports of tests previously performed on the same design are acceptable.
- F. Design Data: Provide framing member structural and physical characteristics and engineering calculations, and identify dimensional limitations; include load calculations at points of attachment to building structure, anchorage method and fasteners. Calculations must be reviewed and be signed and sealed by a Structural Engineer licensed in the State the project is located in.
- G. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.
- H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State of Arkansas.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than three years of documented experience.

1.06 MOCK-UP

- A. See Section 01 4000 - Quality Requirements, for general requirements for mock-ups.
- B. Locate on-site where directed by Architect; mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.08 FIELD CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.09 WARRANTY

- A. See Section 01 7800 - CLOSEOUT SUBMITTALS, for additional warranty requirements.
- B. Correct defective Work, including watertightness of assembly, within a five year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
- D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Kawneer North America; Product 1600 Wall - System 1..
- B. Other Acceptable - Glazed Aluminum Curtain Walls Manufacturers:
 - 1. EFCO, a Pella Company; 5500: www.egcocorp.com
 - 2. Manko Window Systems, Inc: www.mankowindows.com/#sle.
 - 3. Oldcastle Building Envelope: www.oldcastlebe.com/#sle.
 - 4. Tubelite, Inc: www.tubeliteinc.com/#sle.

5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 CURTAIN WALL

- A. Aluminum-Framed Curtain Wall: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
 1. Outside glazed, with pressure plate and mullion cover, where indicated on drawings.
 2. Vertical Mullion Face Width: 2-1/2 inches.
 3. Vertical Mullion Depth From Face of Glazing to Back of Frame: 6-1/4 inches, or otherwise indicated on plans or required to meet structural performance requirements.
- B. Structural Performance Requirements: Design and size components to withstand the following load requirements without damage or permanent set.
 1. Design Wind Loads: Comply with the requirements of ASCE 7, Structural Building Design Wind Loads, design loads listed below; or current code. Use design load which is the greatest.
 - a. Measure performance by testing in accordance with ASTM E330/E330M, using test loads equal to 1.5 times the design wind loads and 10 second duration of maximum pressure.
 - b. Member Deflection: For spans less than 13 feet 6 inches, limit member deflection to flexure limit of glass in any direction, and maximum of 1/175 of span or 3/4 inch, whichever is less and with full recovery of glazing materials.
 - c. Member Deflection: For spans over 13 feet 6 inches and less than 40 feet, limit member deflection to flexure limit of glass in any direction, and maximum of 1/240 of span plus 1/4 inch, with full recovery of glazing materials.
 2. Movement: Accommodate the following movement without damage to components or deterioration of seals:
 - a. Expansion and contraction caused by 180 degrees F surface temperature.
 - b. Expansion and contraction caused by cycling temperature range of 170 degrees F over a 12 hour period.
 - c. Movement of curtain wall relative to perimeter framing.
 - d. Deflection of structural support framing, under permanent and dynamic loads.
- C. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on indoor face when tested as follows:
 1. Test Pressure Differential: 15 lbf/sq ft.
 2. Test Method: ASTM E331.
- D. Air Leakage Laboratory Test: Maximum of 0.06 cu ft/min sq ft of wall area, when tested in accordance with ASTM E283 at 6.27 psf pressure differential across assembly.

2.03 COMPONENTS

- A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
 1. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.
- B. Glazing: As specified in Section 08 8000.
- C. Doors and Hardware: As specified in Section 08 43 13.
- D. Column Covers: Aluminum, 20 gage, 0.032 inch minimum thickness, full contact pressure bonded to _____ for flat surface, finish to match curtain wall framing members.

2.04 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Sheet Aluminum: ASTM B209 (ASTM B209M).
- C. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.

- D. Structural Supporting Anchors: See Section 05 1200.
- E. Structural Supporting Anchors Attached to Structural Steel: Design for bolted attachment.
- F. Structural Supporting Anchors Attached to Reinforced Concrete Members: Design for welded attachment to weld plates embedded in concrete.
- G. Fasteners: Stainless steel ONLY. No exposed fasteners permitted.
- H. Firestopping: As specified in Section 07 8400.
- I. Weatherseal Sealant: Silicone, with adhesion in compliance with ASTM C794; compatible with glazing accessories.
- J. Perimeter Sealant: Type A specified in Section 07 9005.
- K. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
- L. Glazing Accessories: As specified in Section 08 8000.
- M. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

2.05 FINISHES

- A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.
- B. Color: Clear Anodized..
- C. Touch-Up Materials: As recommended by coating manufacturer for field application.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other related work.
- B. Verify that curtain wall openings and adjoining air and vapor seal materials are ready to receive work of this section.
- C. Verify that anchorage devices have been properly installed and located.

3.02 INSTALLATION

- A. Install curtain wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for imposed loads.
- D. Provide alignment attachments and shims to permanently fasten system to building structure.
- E. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
- F. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- G. Provide thermal isolation where components penetrate or disrupt building insulation.
- H. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- I. Coordinate attachment and seal of perimeter air and vapor barrier materials.
- J. Install firestopping at each floor slab edge.
- K. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- L. Install perimeter sealant in accordance with Section 07 9005.

- M. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 0.5 inches per 100 ft, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.
- C. Sealant Space Between Curtain Wall Mullions and Adjacent Construction: Maximum of 3/4 inch and minimum of 1/4 inch.

3.04 FIELD QUALITY CONTROL

- A. Water-Spray Test: Provide water spray quality test of installed curtain wall components in accordance with AAMA 501.2 during construction process and before installation of interior finishes.
 - 1. Perform a minimum of two tests in each designated area as indicated on drawings.
 - 2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.
- B. Repair or replace curtain wall components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.05 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths, take care to remove dirt from corners, and wipe surfaces clean.
- C. Remove excess sealant by method acceptable to sealant manufacturer.

3.06 PROTECTION

- A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

**SECTION 08 6200
UNIT SKYLIGHTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Thermoformed plastic skylights with integral frame.
- B. Integral insulated curb.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Wood framing for rough opening.
- B. Section 06 1000 - Rough Carpentry: Wood support curbs.
- C. Section 07 6200 - Sheet Metal Flashing and Trim: Skylight counterflashing.
- D. Section 07 7200 - Roof Accessories: Manufactured curbs for installation of unit skylights.

1.03 REFERENCE STANDARDS

- A. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for windows, doors, and skylights; 2011.
- B. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- C. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide structural, thermal, and daylighting performance values.
- C. Performance Validation: Provide specified performance validation before submitting shop drawings or starting fabrication.
- D. Shop Drawings: Indicate configurations, dimensions, locations, fastening methods, and installation details.
- E. Manufacturer's Installation Instructions: Indicate special procedures.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with not less than three years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

1.06 WARRANTY

- A. See Section 01 7800 - CLOSEOUT SUBMITTALS, for additional warranty requirements.
- B. Provide five year manufacturer warranty, including coverage for leakage due to defective skylight materials or construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Unit Skylights:
 - 1. Wasco Skylights - Part of the VELUX Group; Deck-Mount Traditional Dome: www.wascoskylights.com/#sle.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 UNIT SKYLIGHTS

- A. Unit Skylights: Factory-assembled glazing in aluminum frame, free of visual distortion, and weathertight.

1. Shape: Square dome.
2. Glazing: Double.
3. Operation: None; fixed.
4. Roof Slope: As indicated on drawings.
5. Nominal Size: 48" by 68" inches.

2.03 PERFORMANCE REQUIREMENTS

- A. Provide unit skylights that comply with the following:
 1. Grade: AAMA/WDMA/CSA 101/I.S.2/A440 requirements for specific skylight type:
 2. Performance Validation: Skylights shall comply with AAMA/WDMA/CSA 101/I.S.2/A440 performance requirements as indicated by having AAMA, WDMA, or CSA certified label, or an independent test report for indicated products itemizing compliance and acceptable by authorities having jurisdiction.
 3. Provide unit skylights capable of withstanding loads as prescribed by the prevailing building code.
 4. Allow for expansion and contraction within system components caused by a cycling surface temperature range of 170 degrees F without causing detrimental effects to system or components.

2.04 COMPONENTS

- A. Double Glazing: Acrylic plastic; factory sealed.
 1. Outer Glazing: Clear transparent.
 2. Inner Glazing: Clear transparent.
- B. Frames: ASTM B221 ASTM B221M Extruded aluminum thermally broken, reinforced and welded corner joints, integral curb frame mounting flange and counterflashing to receive roofing flashing system, with integral condensation collection gutter, glazing retainer; clear anodized finish.
- C. Support Curbs: Sheet aluminum ASTM B209 ASTM B209M, sandwich construction; 1 inch wide, 4 inches high; glass fiber insulation; with integral flange for anchorage to roof deck.

2.05 ACCESSORIES

- A. Anchorage Devices: Type recommended by manufacturer, exposed to view.
- B. Counterflashings: Same metal type and finish as skylight frame.
- C. Sealant: Elastomeric, silicone or polyurethane, compatible with material being sealed .

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that openings and substrate conditions are ready to receive work of this section.

3.02 INSTALLATION

- A. Install skylight units and mount securely to curb assembly; install counterflashing as required.
- B. Apply sealant to achieve watertight assembly.

3.03 CLEANING

- A. Remove protective material from prefinished aluminum surfaces.
- B. Wash down exposed surfaces; wipe surfaces clean.
- C. Remove excess sealant.

END OF SECTION

**SECTION 08 7113
AUTOMATIC DOOR OPERATORS**

PART 1 GENERAL

1.01 REFERENCE STANDARDS

- A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2012.
- B. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- C. BHMA A156.10 - American National Standard for Power Operated Pedestrian Doors; 2011.
- D. BHMA A156.19 - American National Standard for Power Assist and Low Energy Power Operated Doors; 2013.
- E. ICC (IBC) - International Building Code; 2015.
- F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2016.
- H. NFPA 101 - Life Safety Code; 2015.
- I. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2016.
- J. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- K. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

1.02 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.03 SUMMARY

- A. This section includes the following types of automatic door operators:
 - 1. Low-energy door operators for swinging doors.
- B. Related Sections:
 - 1. Division 7 Sections for caulking to the extent not specified in this section.
 - 2. Division 8 Sections for "Aluminum-Framed Entrances and Storefronts" for entrances furnished and installed separately in Division 8 Section.
 - 3. Division 8 Section "Door Hardware" for hardware to the extent not specified in this section.
 - 4. Division 8 Section "Glazing" for materials and installation requirements of glazing for automatic entrances.
 - 5. Division 26 and 28 Sections for electrical connections including conduit and wiring for automatic entrance operators and access-control devices.

1.04 REFERENCES

- A. References: Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ICC (IBC) International Building Code.
 - 3. CUL – Approved for use in Canada.
 - 4. NFPA 70 - National Electrical Code.
 - 5. NFPA 80 - Fire Doors and Windows.
 - 6. NFPA 101 - Life Safety Code.
 - 7. NFPA 105 - Installation of Smoke Door Assemblies.
- B. American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA).

1. ANSI/BHMA A156.19 Standards for Power Assist and Low Energy Power Operated Doors.
- C. Underwriters Laboratories (UL).
 1. UL 10C – Positive Pressure Fire Tests of Door Assemblies.
 2. UL 325 - Standard for Safety for Door, Drapery, Gate, Louver, and Window Operators and Systems.
- D. American Association of Automatic Door Manufacturers (AAADM).
- E. American Society for Testing and Materials (ASTM).
 1. ASTM B221 Standard Specification for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
 2. ASTM B209 Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate.
- F. American Architectural Manufacturers Association (AAMA).
 1. AAMA 611 Voluntary Specification for Anodized Architectural Aluminum.
- G. National Association of Architectural Metal Manufacturers (NAAMM).
 1. Metal Finishes Manual for Architectural Metal Products.
- H. International Code Council (IBC).
 1. IBC: International Building Code Building Code.

1.05 DEFINITIONS

- A. Activation device: Device that, when actuated, sends an electrical signal to the door operator to initiate the door operation.
- B. Monitored Safety Devices: A tested system that works in conjunction with the automatic door control that detects the presence of a person or an object within a zone where contact could occur and provides a signal to stop the movement of the door.
- C. AAADM: American Association of Automatic Door Manufacturers.
- D. Operating ambient Temperature Range: 5 Degrees F to plus 122 degrees Fahrenheit.
- E. For automatic door terminology, refer to ANSI/BHMA A156.19 for definitions of terms.

1.06 PERFORMANCE REQUIREMENTS

- A. General: Provide automatic doors that have been designed and fabricated to comply with specified performance requirements, as demonstrated by testing manufacturers corresponding systems.
- B. Compliance:
 1. ICC (IBC) International Building Code
 2. ANSI/BHMA A156.19 American National Standard for Power Operated Doors Pedestrian Doors.
 3. UL 325 Listed
 4. NFPA 70 National Electrical Code.
 5. NFPA 101 Life Safety Code
 6. CUL Approved for use in Canada
 7. UL Listed Fire Door Operator with Automatic Closer
- C. Automatic Door equipment accommodates medium to heavy pedestrian traffic.
- D. Opening Force Requirements:
 1. Power-Operated swinging doors shall open with a manual force not to exceed 30 lbf (133N) to set the door in motion and 15 lbf to fully open the door with force applied at 1" (25mm) from the latched edge of the door. The required force to prevent a stopped door from opening or closing shall to exceed 15 lbf (67N) measured 1" (25mm) from the latch edge of the door at any point during the opening or closing.
- E. Closing Time:

1. Door operators shall be field adjustable to close 90 degrees to 10 degrees in 3 seconds or longer per ANSI/BHMA A156.19 standard.
2. Door shall be field adjusted to close from 10 degrees to fully closed position in not less than 1.5 seconds.

1.07 SUBMITTALS

- A. Comply with Division 01 – Submittal Procedures.
- B. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles fabrication, operational descriptions and finishes.
- C. Shop Drawings: For automatic entrances. Include plans, elevations, sections, details, hardware mounting heights, additional accessories and attachments to other work.
- D. Samples: color samples of exposed finish as required.
- E. Informational Submittals: Manufacturers product information and applicable sustainability program credits that are available towards a LEED rated product certification.
 1. Credit MR 4.1 and 4.2: Manufacture's or fabricator's certificate indicating percentage of post-consumer recycled content by weight and pre-consumer recycled content by weight for each product specified under this section.
- F. Manufacturers Field Reports: Submit manufacturer's field reports from AAADM certified technician of inspection and approval of doors for compliance with ANSI/BHMA A156.19 after completion of installation.
- G. Operating and Maintenance Manuals: Provide manufacturers operating, owners and maintenance manuals for each item specified as required in Division 01, Closeout Submittals.

1.08 QUALITY ASSURANCE

- A. Manufacturer Qualifications: 10 years minimum of documented experience in manufacturing door equipment similar to that indicated within this specification with a proven record of successful service performance. A manufacturer with company certificate issued by AAADM.
- B. Installer Qualifications: Installers, trained by the primary product manufacturers, with a minimum 5 years documented experience installing and maintenance of units similar in material, design, and extent to that indicated in this specification and whose work has resulted in construction with a record of successful in-service performance. Manufacturer's authorized representative who is trained and approved for installation and maintenance of units by AAADM required for this Project
- C. Source Limitations for Automatic Operators: Obtain each type of automatic door operator and sensor components specified in this section from single source from single manufacturer.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- E. Power-Operated Door Standard: ANSI/BHMA A156.19 Current year.
- F. Emergency-Exit Door Requirements: Comply with requirements of authorities having jurisdiction for automatic entrances serving as a required means of egress.

1.09 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings to receive automatic entrances by field measurements before fabrication.

1.10 COORDINATION

- A. Coordinate door operators with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish. Coordinate hardware for automatic entrances with hardware required for rest of project.
- B. Electrical System Roughing-in: Coordinate layout and installation of automatic power door operator with connections to power supplies and access-control system.

1.11 WARRANTY

- A. Automatic Door Operators to be free of defects in material and workmanship for a period of One (1) year from the date of substantial completion.
- B. During the warranty period a factory trained technician shall preform service and affect repairs. A safety inspection shall be performed after each adjustment or repair and a completed inspection form submitted to the owner.
- C. During the warranty period all warranty work shall be performed during normal working hours.

PART 1 PRODUCTS

2.01 MANUFACTURER

- A. dormakaba • Reamstown, PA • 1-844-SPEC-NOW (1-844-773-2669) • Website: www.dormakaba.us • Email: specnow@dorma.com
- B. Substitutions: See Substitution Request Form in Section 00 6325.

2.02 AUTOMATIC SWING DOOR OPERATOR

- A. Model: DORMA, ED Series ED250 (Basis of Design) An Integrated, self-learning automatic swing door operator with an advanced CPU, a multistage gearbox with real time adaptive software and available user interface.
 - 1. Automatic Door Configuration:
 - a. Configuration: Single swing door or pair of doors swinging.
 - b. Traffic Pattern: two-way
 - c. Mounting: Surface applied
- B. Control Features
 - 1. Power-hold Close
 - 2. Built in Lock Delay
 - 3. On-Off-Hold Open switch control to control door function, (Automatic-Hold Open- Exit Only)
 - 4. On-Off Power Switch
 - 5. Fire Alarm Integration
 - 6. Field Adjustable Handing
 - 7. Push and Go
 - 8. Power Assist Opening Activation
 - 9. Intergraded Connections for Monitored Safety Sensors and other accessories.
 - 10. Integrated access control
- C. Door Control Features
 - 1. Wind Load and Stack Pressure microprocessor monitored with power boost to ensure secure opening and closing in changing conditions.
 - 2. Door Weight Max. ED 250 800 lbs.
- D. Header Size: Fine header height at 2 ¾" by 5" 1/8" depth.

2.03 ACTIVATION DEVICES

- A. Activation Device:
 - 1. Push Plate: Hard wired, 4-3/4 inch square or 6 inch round stainless steel push plate engraved with "Push to Open" with a handicap logo.
 - 2. Access control activator: as selected by architect.

2.04 SAFETY DEVICES

- A. Provide door controls in accordance with ANSI/BHMA standards A 156.19 and complying with cited BHMA standard for condition of exposure and for long-term, maintenance-free operation under normal traffic load. When presence sensors are used, they shall be monitored in accordance with ANSI/BHMA A156.10. Coordinate controls with door operation and door operators.

2.05 ELECTRICAL

- A. Electrical 115 V AC +/- 10% 50/60 Hz 6.6 A max.

2.06 ALUMINUM FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Anodized Finish:
 - 1. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class II, 0 inch.
 - 2. Clear Anodic Finish: AAMA 611, AA-M12C22A31, Class I, 0 inch

EXECUTION

PART 2 EXECUTION

4.01 EXAMINATION

- A. Examine doors and frames with Installer present, for compliance with requirements for installation tolerances, wall and floor construction and other conditions affecting performance of automatic entrances.
- B. Examine roughing in for electrical source power to verify actual locations of wiring connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

4.02 INSTALLATION

- A. General: Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure non-movement joints.
- B. Entrances: Install automatic entrances plumb and true in alignment with established lines and grades without warp or rack of framing members and doors. Anchor securely in place.
 - 1. Install surface-mounted hardware using concealed fasteners to greatest extent possible.
 - 2. Set headers, carrier assemblies, tracks, operating brackets, and guides level and true to location with anchorage for permanent support.
- C. Door Operators: Connect door operators to electrical power distribution system as specified in Division 26 Sections
- D. Sealants: Comply with requirements specified in Division 07 Section "Joint Sealants" to provide seal between the operator housing and wall surface. installation.
- E. Signage: Apply signage on both sides of each door and each sidelight as required by ANSI/BHMA A156.19

4.03 FIELD QUALITY CONTROL

- A. Manufacturer's representative shall provide technical assistance and guidance for installation of automatic doors.
 - 1. Factory trained and AAADM certified representative shall test and inspect each automatic door to determine compliance of the installed system to ANSI/BHMA A156.19

4.04 ADJUSTING

- A. Adjust door operators and controls for smooth and safe operation.

4.05 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by automatic operator installation promptly after installation .

4.06 DEMONSTRATION

- A. Engage a factory authorized representative to train Owner's maintenance personnel to adjust, operate, and maintain safe operation of automatic entrances.

END OF SECTION

**SECTION 08 8000
GLAZING**

PART 1 GENERAL V.22

1.01 SECTION INCLUDES

- A. Insulating glass units.
- B. Glazing units to be installed in window opening or door assemblies.
- C. Fire-resistant rated and Fire-Protection rated glazing.
- D. Glazing compounds and accessories.
- E. Unframed glass or mirrors applied directly to wall surfaces.

1.02 REFERENCE STANDARDS

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test; 2010.
- C. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2010, with 2013 Supplements and Errata.
- D. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2011).
- E. ASTM C1036 - Standard Specification for Flat Glass; 2011.
- F. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.
- G. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass; 2015.
- H. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2015.
- I. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2012a.
- J. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2010.
- K. GANA (GM) - GANA Glazing Manual; 2009.
- L. GANA (LGRM) - Laminated Glazing Reference Manual; 2009.
- M. GANA (SM) - GANA Sealant Manual; 2008.
- N. ICC (IBC) - International Building Code; 2015.
- O. IGMA TM-3000 - North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial & Residential Use; 1990 (2004).
- P. ITS (DIR) - Directory of Listed Products; current edition.
- Q. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2012.
- R. NFPA 257 - Standard on Fire Test for Window and Glass Block Assemblies; 2012.
- S. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2014.
- T. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2014.
- U. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2014.
- V. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.
- W. UL 9 - Standard for Fire Tests of Window Assemblies; Current Edition, Including All Revisions.

LREYEC26.00

- X. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- Y. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- Z. UL 263 - Standard for Fire Tests of Building Construction and Materials; Current Edition, Including All Revisions.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by each of the affected installers.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data on Insulating Glass Unit and Glazing Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
- C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
- D. Samples: Submit one sample 12 by 12 inch in size of glass units.
- E. Certificate: Certify that products of this section meet or exceed specified requirements.
- F. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA (GM), GANA (SM), GANA (LGRM), and IGMA TM-3000 for glazing installation methods. Maintain one copy on site.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years documented experience.

1.06 MOCK-UPS

- A. Provide mock-up of window assembly including glass and air barrier and vapor retarder seal.

1.07 FIELD CONDITIONS

- A. Do not install glazing when ambient temperature is less than 40 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.08 WARRANTY

- A. See Section 01 7800 - CLOSEOUT SUBMITTALS, for additional warranty requirements.
- B. Insulating Glass Units: Provide a five (5) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Float Glass Manufacturers:
 - 1. AGC Glass North America, Inc: www.agcglass.com/#sle.
 - 2. Guardian Glass, LLC: www.guardianglass.com/#sle.
 - 3. Pilkington North America Inc: www.pilkington.com/na/#sle.
 - 4. Vitro Architectural Glass (formerly PPG Glass): www.vitroglazings.com/#sle.
 - 5. Substitutions: Refer to Section 01 6000 - Product Requirements.
- B. Fire-Resistance-Rated and Fire-Protection-Rated Glass: Provide products as required to achieve indicated fire-rating period.

1. Manufacturers:
 2. SAFTIFIRST, a division of O'Keeffe's Inc; SuperLite II-XL: www.safti.com/#sle.
 3. Technical Glass Products; Pilkington Pyrostop: www.fireglass.com/#sle.
 4. Vetrotech North America; Contraflam: www.vetrotechusa.com/#sle.
- C. Mirrored Glass Manufacturers:
1. Pilkington North America Inc; Pilkington Mirropane Transparent Mirror: www.pilkington.com/na/#sle.

2.02 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

- A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
1. Design Pressure: Calculated in accordance with ASCE 7 or no less than as indicated on structural plans for building ultimate wind speed.
 2. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
 3. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/200 of their lengths under specified design load.
 4. Glass thicknesses listed are minimum.
- B. Vapor Retarder and Air Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure vapor retarder and air barrier.
1. In conjunction with vapor retarder and joint sealer materials described in other sections.
 2. To utilize the inner pane of multiple pane insulating glass units for the continuity of the vapor retarder and air barrier seal.
- C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
 2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
 3. Solar Optical Properties: Comply with NFRC 300 test method.

2.03 GLASS MATERIALS

- A. Float Glass: Provide float glass based glazing unless otherwise indicated.
1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality - Q3.
 2. Kind HS - Heat-Strengthened Type: Complies with ASTM C1048.
 3. Kind FT - Fully Tempered Type: Complies with ASTM C1048.
 4. Fully Tempered Safety Glass: Complies with ANSI Z97.1 or 16 CFR 1201 criteria for safety glazing used in hazardous locations.
 5. Tinted Type: ASTM C1036, Class 2 - Tinted, with color and performance characteristics as indicated.
 6. Thicknesses: As indicated; provide greater thickness as required for exterior glazing wind load design.

2.04 INSULATING GLASS UNITS

- A. Manufacturers:
1. Any of the manufacturers specified for float glass.
 2. Substitutions: Refer to Section 01 6000 - Product Requirements.
- B. Insulating Glass Units: Types as indicated.
1. Durability: Certified by an independent testing agency to comply with ASTM E2190.

2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
 3. Metal Edge Spacers: Aluminum, bent and soldered corners.
 4. Spacer Color: Black.
 5. Edge Seal:
 - a. Dual-Sealed System: Provide polyisobutylene sealant as primary seal applied between spacer and glass panes, and silicone, polysulfide, or polyurethane sealant as secondary seal applied around perimeter.
 6. Color: Black.
 7. Purge interpane space with dry air, hermetically sealed.
- C. Type IG-1 - Insulating Glass Units: Vision glass, double glazed.
1. Applications: Typical all Exterior glazing unless otherwise indicated
 2. Space between lites filled with air.
 3. Outboard Lite: Annealed float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 - b. Coating: Graylite II - 6mm, on #1 surface.
 4. Inboard Lite: Annealed float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 - b. Coating: Solarban 70, on #3 surface.
 5. Total Thickness: 1 inch.
 6. Thermal Transmittance (U-Value), Summer - Center of Glass: 0.29, nominal.
 7. Visible Light Transmittance (VLT): 51 percent, nominal.
 8. Solar Heat Gain Coefficient (SHGC): 0.35, nominal.
- D. Type IG-2 - Insulating Glass Units: Spandrel glazing.
1. Applications: Exterior spandrel glazing unless otherwise indicated.
 2. Space between lites filled with air.
 3. Outboard Lite: Annealed float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 - b. Coating: Same as on vision units, on #2 surface.
 4. Inboard Lite: Heat-strengthened float glass, 1/4 inch thick.
 - a. Opacifier: Ceramic frit, on #4 surface.
 - b. Opacifier Color: to be selected by Architect.
 - c. Opacifier may be exposed on interior; apply sufficient coats of opacifier to achieve 100% even spaced coverage when viewed from interior.
 5. Total Thickness: 1 inch.
 6. Glazing Method: Dry glazing method, gasket glazing.
- E. Type IG-3 - Insulating Glass Units: Safety glazing.
1. Applications: provide this type of glazing in the following locations:
 - a. Glazed lites in all exterior doors.
 - b. Glazed sidelights and panels next to doors.
 - c. Other locations required by applicable federal, state, and local codes and regulations.
 - d. Other locations indicated on drawings.
 2. Space between lites filled with air.
 3. Glass Type: Same as other vision glazing except use fully tempered float glass for both outboard and inboard lites.

2.05 GLAZING UNITS

- A. Type G-2 - Monolithic Interior Vision Glazing:
1. Applications: Typical Interior glazing unless otherwise indicated.
 2. Glass Type: Annealed float glass.
 3. Tint: Clear.

4. Thickness: 1/4 inch, nominal.
 5. Glazing Method: Dry glazing method, gasket glazing.
- B. Type G-3 - Fire-Resistance-Rated Glazing: Type, thickness, and configuration of glazing that contains flame, smoke, and blocks radiant heat, as required to achieve indicated fire-rating period exceeding 45 minutes.
1. Applications:
 - a. Glazing in fire-rated door and window assemblies.
 - b. Glazing in sidelites, borrowed lites, and other glazed openings in fire-rated wall assemblies.
 2. Glass Type: Multi-laminate annealed glass with intumescent fire retardant interlayers, or other pre-approved type that meets rating and testing requirements.
 3. Provide products listed by ITS (DIR) or UL (DIR) and approved by authorities having jurisdiction.
 4. Safety Glazing Certification: 16 CFR 1201 Category II.
 5. Glazing Method: As required for fire rating.
 6. Fire-Rating Period: 60 minutes or greater as required by drawings.
 7. Markings for Fire-Resistance-Rated Glazing Assemblies: Provide permanent markings on fire-resistance-rated glazing in compliance with ICC (IBC), local building code, and authorities having jurisdiction.
 - a. "W" - meets wall assembly criteria of ASTM E119 or UL 263 fire test standards.
 - b. "D" - meets fire door assembly criteria of NFPA 252, UL 10B, or UL 10C fire test standards.
 - c. "H" - meets fire door assembly hose stream test of NFPA 252, UL 10B, or UL 10C fire test standards.
 - d. "T" - meets temperature rise of not more than 450 degrees F above ambient at end of 30 minutes fire exposure in accordance with NFPA 252, UL 10B, or UL 10C fire test standards.
 - e. "XXX" - placeholder that represents fire-rating period, in minutes.
- C. Type G-4 - Fire-Protection-Rated Glazing: Type, thickness, and configuration of glazing that contains flame, smoke, and does not block radiant heat, as required to achieve fire-doors indicated fire-rating period of 45 minutes or less.
1. Applications:
 - a. Glazing in fire-rated door and window assemblies.
 - b. Other locations as indicated on drawings.
 2. Glass Type: Specialty tempered float glass with modifications such as surface applied films as necessary or required.
 3. Provide products listed by ITS (DIR) or UL (DIR) and approved by authorities having jurisdiction.
 4. Safety Glazing Certification: 16 CFR 1201 Category II.
 5. Glazing Method: As required for fire rating.
 6. Fire-Rating Period: 45 minutes or less as indicated on drawings.
 7. Markings for Fire-Protection-Rated Glazing Assemblies: Provide permanent markings on fire-protection-rated glazing in compliance with ICC (IBC), local building code, and authorities having jurisdiction
 - a. "D" - meets fire door assembly criteria of NFPA 252, UL 10B, or UL 10C fire test standards.
 - b. "OH" - meets fire window assembly criteria including hose stream test of NFPA 257, or UL 9 fire test standards.
 - c. "H" - meets fire door assembly hose stream test of NFPA 252, UL 10B, or UL 10C fire tests standards.
 - d. "XXX" - placeholder that represents fire-rating period, in minutes.
- D. Type G-5 - Monolithic Safety Glazing: Non-fire-rated.
1. Applications: Provide this type of glazing in the following locations, non-fire rated:

- a. Glazed lites in interior doors and sidelights.
- b. Other locations required by applicable federal, state, and local codes and regulations.
- c. Other locations indicated on drawings.
- 2. Glass Type: Fully tempered safety glass as specified.
- 3. Tint: Clear or as indicated.
- 4. Thickness: 1/4 inch, nominal.
- E. Type M-1 - Clear, tempered safety glass; ASTM C1048, with copper and silver coatings, and protective overcoating.
 - 1. Applications: Locations as indicated on drawings.
 - 2. Thickness: 1/4 inch.
 - 3. Glass Tint: None..
 - 4. Glass Type: Fully tempered.

2.06 GLAZING COMPOUNDS

- A. Manufacturers:
 - 1. BASF Corporation: www.basf.com/#sle.
 - 2. Dow Corning Corporation: www.dowcorning.com/construction/#sle.
 - 3. Pecora Corporation: www.pecora.com/#sle.
 - 4. Substitutions: Refer to Section 01 6000 - Product Requirements.

2.07 ACCESSORIES

- A. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.
- B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.
- C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black color.
- D. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.
- E. Glazing Clips: Manufacturer's standard type.
- F. Mirror Adhesive: Chemically compatible with mirror coating and wall substrate.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

- A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.

3.02 PREPARATION

- A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

3.04 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)

- A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building. Follow window assembly manufacturer instructions for placement of glazing.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
- D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact. Apply sealant at corners as necessary to ensure gasket has full contact.

3.05 INSTALLATION - DRY GLAZING METHOD (TAPE AND TAPE)

- A. Application - Interior Glazed: Set glazing infills from the interior of the building.
- B. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch above sight line.
- C. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- D. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
- E. Place glazing tape on free perimeter of glazing in same manner described above.
- F. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact. Apply sealant at corners as necessary to ensure gasket has full contact.
- G. Carefully trim protruding tape with knife.

3.06 INSTALLATION - MIRRORS

- A. Install mirrors in accordance with GANA (TIPS) and manufacturers recommendations.
- B. Set mirrors plumb and level, and free of optical distortion.
- C. Set mirrors with edge clearance free of surrounding construction including countertops or backsplashes.

3.07 CLEANING

- A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
- B. Remove non-permanent labels immediately after glazing installation is complete.
- C. Clean glass and adjacent surfaces after sealants are fully cured.
- D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.08 PROTECTION

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.
- B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION

**SECTION 09 0561
COMMON WORK RESULTS FOR FLOORING PREPARATION**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings:
 - 1. Resilient tile and sheet.
 - 2. Broadloom carpet.
 - 3. Carpet tile.
 - 4. Thin-set ceramic tile and stone tile.
- B. Removal of existing floor coverings.
- C. Preparation of new and existing concrete floor slabs for installation of floor coverings.
- D. Testing of concrete floor slabs for moisture and alkalinity (pH).
- E. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.
 - 1. Contractor shall perform all specified remediation of concrete floor slabs. If such remediation is indicated by testing agency's report and is due to a condition not under Contractor's control or could not have been predicted by examination prior to entering into the contract, a contract modification will be issued.
- F. Patching compound.
- G. Remedial floor coatings.
- H. Remedial floor sheet membrane.

1.02 REFERENCE STANDARDS

- A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2013.
- B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete; 1999 (Reapproved 2014).
- C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.
- D. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2011.
- E. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2011.
- F. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; Resilient Floor Covering Institute; October 2011.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

1.04 SUBMITTALS

- A. Visual Observation Report: For existing floor coverings to be removed.
- B. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
 - 1. Moisture and alkalinity (pH) limits and test methods.
 - 2. Manufacturer's required bond/compatibility test procedure.
- C. Testing Agency's Report:
 - 1. Description of areas tested; include floor plans and photographs if helpful.
 - 2. Summary of conditions encountered.

3. Moisture and alkalinity (pH) test reports.
 4. Copies of specified test methods.
 5. Recommendations for remediation of unsatisfactory surfaces.
 6. Product data for recommended remedial coating.
 7. Submit report to Architect.
 8. Submit report not more than two business days after conclusion of testing.
- D. Adhesive Bond and Compatibility Test Report.
- E. Copy of RFCI (RWP).

1.05 QUALITY ASSURANCE

- A. Moisture and alkalinity (pH) testing will be performed by an independent testing agency employed and paid by Owner.
- B. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.
1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project Owner's project contact information.
- C. Contractor's Responsibility Relating to Independent Agency Testing:
1. Provide access for and cooperate with testing agency.
 2. Confirm date of start of testing at least 10 days prior to actual start.
 3. Allow at least 4 business days on site for testing agency activities.
 4. Achieve and maintain specified ambient conditions.
 5. Notify Owner when specified ambient conditions have been achieved and when testing will start.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, handle, and protect products in accordance with manufacturer's instructions and recommendations.
- B. Deliver materials in manufacturer's packaging; include installation instructions.
- C. Keep materials from freezing.

1.07 FIELD CONDITIONS

- A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.
- B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:
1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
 2. Latex or polyvinyl acetate additions are permitted; gypsum content is prohibited.
 3. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.
- B. Remedial Floor Coating: Single- or multi-layer coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.

1. Thickness: 1/8 inch, maximum.
2. Products:
 - a. ARDEX Engineered Cements; ARDEX MC RAPID: www.ardexamericas.com/#sle.
 - b. Floor Seal Technology, Inc; MES 100 with Floor Seal FloorCem SLU: www.floorseal.com/#sle.
 - c. Sika Corporation; Sikafloor Moisture Tolerance Epoxy Primer and Sikafloor Self-Leveling Moisture Tolerant Resurfacer: www.sikafloorusa.com/#sle.
 - d. Tnemec Company, Inc; Series 208 Epoxoprime MVT: www.tnemec.com/#sle.
- C. Remedial Floor Sheet Membrane: Pre-formed multi-ply sheet membrane installed over concrete subfloor and intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.
 1. Thickness: 28 mil (0.028 inch).
 2. Tape: Types recommended by underlayment manufacturer to install membrane and cover seams.
 3. Products:
 - a. GCP Applied Technologies; Kovara MBX: www.gcpat.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

- A. Perform following operations in the order indicated:
 1. Preliminary cleaning.
 2. Moisture vapor emission tests; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.
 3. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
 4. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
 5. Specified remediation, if required.
 6. Patching, smoothing, and leveling, as required.
 7. Other preparation specified.
 8. Adhesive bond and compatibility test.
 9. Protection.
- B. Remediations:
 1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
 2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.
 3. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.02 REMOVAL OF EXISTING FLOOR COVERINGS

- A. Comply with local, State, and federal regulations and recommendations of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings, as applicable to floor covering being removed.

- B. Dispose of removed materials in accordance with local, State, and federal regulations and as specified.

3.03 PRELIMINARY CLEANING

- A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.
- B. Do not use solvents or other chemicals for cleaning.

3.04 MOISTURE VAPOR EMISSION TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.
- C. Test in accordance with ASTM F1869 and as follows.
- D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.
- E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.
- F. Report: Report the information required by the test method.

3.05 INTERNAL RELATIVE HUMIDITY TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.
- C. Test in accordance with ASTM F2170 Procedure A and as follows.
- D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.
- E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.
- F. Report: Report the information required by the test method.

3.06 ALKALINITY TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. The following procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.
 - 1. Use a wide range alkalinity (pH) test paper, its associated chart, and distilled or deionized water.
 - 2. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch in diameter. Allow the puddle to set for approximately 60 seconds, then dip the alkalinity (pH) test paper into the water, remove it, and compare immediately to chart to determine alkalinity (pH) reading.
 - 3. Use of a digital pH meter with probe is acceptable; follow meter manufacturer's instructions.

- C. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

3.07 PREPARATION

- A. See individual floor covering section(s) for additional requirements.
- B. Comply with requirements and recommendations of floor covering manufacturer.
- C. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.
- D. Do not fill expansion joints, isolation joints, or other moving joints.

3.08 ADHESIVE BOND AND COMPATIBILITY TESTING

- A. Comply with requirements and recommendations of floor covering manufacturer.

3.09 APPLICATION OF REMEDIAL FLOOR COATING

- A. Comply with requirements and recommendations of coating manufacturer.

3.10 INSTALLATION OF REMEDIAL FLOOR SHEET MEMBRANE

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

END OF SECTION

**SECTION 09 2116
GYPSUM BOARD ASSEMBLIES**

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

- A. Performance criteria for gypsum board assemblies.
- B. Metal partition and soffit framing.
- C. Metal channel ceiling framing.
- D. Acoustic insulation.
- E. Cementitious backing board.
- F. Gypsum wallboard.
- G. Joint treatment and accessories.
- H. Framing Accessories.

1.02 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 C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.
- D. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2015.
- E. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2013.
- F. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2015.
- G. 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.
- H. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base; 2014a.
- I. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014.
- J. ASTM C1658/C1658M - Standard Specification for Glass Mat Gypsum Panels; 2013.
- K. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.
- L. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009.
- M. ASTM E413 - Classification for Rating Sound Insulation; 2010.
- N. GA-216 - Application and Finishing of Gypsum Board; 2013.
- O. GA-600 - Fire Resistance Design Manual; 2015.
- P. UL (FRD) - Fire Resistance Directory; current edition.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.
 - 1. Indicate special details associated with fireproofing and acoustical seals.

2. Indicate component details, stud layout, framed openings, anchorage to structure, acoustic details, type and location of fasteners, accessories, and items of other related work.
 3. Describe method for securing studs to track, splicing, and for blocking and reinforcing of framing connections.
 4. Provide partition legend indicating proposed assembly components at each partition type.
- C. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system. Include framing load charts and limitations.
- D. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
- E. Test Reports: For stud framing products that do not comply with ASTM C645 or ASTM C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum 5 years of documented experience.

1.05 MOCK-UP

- A. Provide mock-up of stud wall, ceiling, and soffit framing including insulation, sheathing, window frame, and door frame and finish specified in other sections. Coordinate installation of associated work specified in other sections.
1. Mock-up may remain part of finish work.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

- A. Provide completed assemblies complying with ASTM C840 and GA-216.
1. See PART 3 for finishing requirements.
- B. Interior Partitions, Indicated as Acoustic and/or STC on partition schedule: 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. Treat all penetrations and perimeters of wall assembly with acoustical sealant, both sides of wall.
- C. Fire Rated Assemblies: Provide completed assemblies as indicated on partition schedule and complying with applicable code.
1. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL (FRD).

2.02 METAL FRAMING MATERIALS

- A. Manufacturers - Metal Framing, Connectors, and Accessories:
1. ClarkDietrich: www.clarkdietrich.com/#sle.
 2. Marino: www.marinoware.com/#sle.
 3. Phillips Manufacturing Co: www.phillipsmfg.com/#sle.
 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/240 at 5 psf, with steel thickness not less than 20 gauge (30 mils). Adjust steel thickness to comply with deflection with stud heights. Walls with tile or masonry veneer, comply with deflection of wall framing of L/360 at 5psf.
1. Studs: "C" shaped with knurled or embossed faces.
 2. Runners: U shaped, sized to match studs.
 3. Ceiling Channels: C-shaped.

- 4. Furring Members: Hat-shaped sections, minimum depth of 7/8 inch.
- C. Partition Head To Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short and fastened as indicated on drawings.
- D. Tracks and Runners: Same material and thickness as studs, bent leg retainer notched to receive studs.
- E. Furring and Bracing Members: Of same material as studs; thickness to suit purpose; complying with applicable requirements of ASTM C754.
- F. Metal Framing Fasteners: ASTM C1002 self-piercing tapping screws.
- G. Sheet Metal Backing: 0.036 inch thick, galvanized.
- H. Partial Height partitions: Use steel wall stiffeners bolted to floor surface and stud framing at 48" o.c., minimum of two per wall. Provide No-Flex Stud Stiffeners, or approved equal.
www.noflex.com.

2.03 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
 - 1. American Gypsum Company: www.americangypsum.com/#sle.
 - 2. Georgia-Pacific Gypsum: www.gpgypsum.com/#sle.
 - 3. National Gypsum Company: www.nationalgypsum.com/#sle.
 - 4. Temple-Inland Building Product by Georgia-Pacific, LLC: www.temple.com.
 - 5. USG Corporation: www.usg.com/#sle.
- 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 standard vertical surfaces and ceilings, unless otherwise indicated.
 - 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - a. Mold-resistant board is required whenever board is being installed before the building is enclosed and conditioned.
 - b. Mold resistant board is required at all toilet rooms, janitor closets, laundry rooms, kitchen and similar wet area at all wet locations such as: Locker, shower, toilet rooms, kitchens, janitor closets, etc and behind plumbing fixtures locations. Also refer to partition schedule and locations otherwise noted.
 - 3. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
 - 4. Thickness:
 - a. Vertical Surfaces: 5/8 inch.
 - b. Ceilings: 5/8 inch., sag resistant.
 - 5. Paper-Faced Products:
 - a. American Gypsum Company; LightRoc Gypsum Wallboard.
 - b. Georgia-Pacific Gypsum; ToughRock.
 - c. Georgia-Pacific Gypsum; ToughRock Fireguard X.
 - d. Georgia-Pacific Gypsum; ToughRock Fireguard C.
 - e. Substitutions: See Section 01 6000 - Product Requirements.
 - 6. Mold Resistant Paper Faced Products:
 - a. American Gypsum Company; M-Bloc.
 - b. Continental Building Products; Mold Defense Type X.
 - c. Georgia-Pacific Gypsum; ToughRock Mold-Guard.
 - d. Georgia-Pacific Gypsum; ToughRock Fireguard X Mold-Guard.
 - e. National Gypsum Company; Gold Bond XP Gypsum Board.
 - f. Lafarge North America Inc; Mold Defense Drywall.
 - g. National Gypsum Company; Gold Bond Brand XP Gypsum Board.

- h. Temple-Inland Building Product by Georgia-Pacific, LLC; ComfortGuard Mold Resistant Gypsum Board.
 - i. USG Corporation; Sheetrock Brand Mold Tough Gypsum Panels.
- C. Tile Backer Board: As specified in section 09 3000.
- D. Exterior Sheathing Board: As specified in Section 06 1000.

2.04 GYPSUM WALLBOARD ACCESSORIES

- A. Acoustic Insulation: As specified in Section 07 2100.
- B. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
- C. Acoustic Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board.
- D. Water-Resistive Barrier: As specified in Section 07 2500.
- E. Finishing Accessories: ASTM C1047, galvanized steel, pre-approved rigid plastic, rolled zinc, pre-approved rigid plastic, or pre-approved rigid plastic, unless noted otherwise.
 - 1. Types: As detailed or required for finished appearance.
 - 2. Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed panel edges.
 - 3. Products:
 - a. Phillips Manufacturing Co: www.phillipsmfg.com/#sle.
 - b. Trim-tex, Inc: www.trim-tex.com/#sle.
 - c. Fry Reglet Corporation; www.fryreglet.com
 - d. Substitutions: See Section 01 6000 - Product Requirements.
- F. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
 - 1. Fiberglass Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
 - 2. Paper Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
 - 3. Joint Compound: Drying type, vinyl-based, ready-mixed.
 - 4. Joint Compound: Setting type, field-mixed.
- G. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inches in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion-resistant.
- H. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion-resistant.

2.05 FABRICATION

- A. Fabricate assemblies of framed sections to sizes and profiles required.
- B. Fit, reinforce, and brace framing members to suit design requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that project conditions are appropriate for work of this section to commence.
- B. Verify existing conditions before starting work.
- C. Verify that rough-in utilities are in proper location.

3.02 SHAFT WALL INSTALLATION

- A. Shaft Wall Framing: Install in accordance with manufacturer's installation instructions.
 - 1. Fasten runners to structure with short leg to finished side, using appropriate power-driven fasteners at not more than 24 inches on center.
 - 2. Install studs at spacing required to meet performance requirements.

- B. Shaft Wall Liner: Cut panels to accurate dimensions and install sequentially between special friction studs.
 - 1. On walls over sixteen feet high, screw-attach studs to runners top and bottom.
 - 2. Seal perimeter of shaft wall and penetrations with acoustical sealant.

3.03 FRAMING INSTALLATION

- A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.
- B. Suspended Ceilings and Soffits: Space framing and furring members at 16 inches on center.
 - 1. Laterally brace entire suspension system.
- C. Studs: Space studs at 16 inches on center or as otherwise scheduled.
 - 1. Extend partition framing to structure in all locations or as otherwise specifically noted on partition schedule.
 - 2. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs with continuous bridging.
 - 3. Align stud web openings horizontally.
 - 4. Secure studs to track using fastener method. Do not weld.
 - 5. Stud splicing is not permissible.
 - 6. Fabricate corners using a minimum of three studs.
- D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jamb, not more than 2 inches from each side of opening. Refer to framing details on plans.
- E. Standard Wall Furring: Install at concrete walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.
 - 1. Orientation: Horizontal.
 - 2. Spacing: As indicated.
- F. Acoustic Furring: Install resilient channels at maximum 24 inches on center. Locate joints over framing members.
- G. Furring for Fire-Resistance Ratings: Install as required for fire-resistance ratings indicated and to GA-600 requirements.
- H. Blocking: Coordinate installed bucks, support systems, anchors and blocking with electrical, mechanical and other work to be placed within or behind stud framing. Install wood blocking for support of:
 - 1. Wall-mounted cabinets.
 - 2. Plumbing fixtures.
 - 3. Toilet partitions.
 - 4. Toilet accessories.
 - 5. Wall-mounted door hardware.

3.04 CEILING AND SOFFIT FRAMING

- A. Install furring after work above ceiling or soffit is complete. Coordinate the location of hangers with other work.
- B. Install furring independent of walls, columns, and above-ceiling work.
- C. Securely anchor hangers to structural members or embed in structural slab. Space hangers as required to limit deflections to criteria indicated. Use rigid hangers at exterior soffits.
- D. Space main carrying channels at maximum 72 inch on center, and not more than 6 inches from wall surfaces. Lap splice securely.
- E. Securely fix carrying channels to hangers to prevent turning or twisting and to transmit full load to hangers.

- F. Place furring channels perpendicular to carrying channels, not more than 2 inches from perimeter walls and rigid secure. Lap splices securely.
- G. Laterally brace suspension system.

3.05 ACOUSTIC ACCESSORIES INSTALLATION

- A. Install insulation material type as indicated in 07 2100 into partition cavities.
- B. 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. At locations in stud cavities not covered by sheetrock, install strapping or retainer wires to hold insulation in place.
- C. Acoustic Sealant: Install in accordance with manufacturer's instructions.
 - 1. Place one bead continuously on substrate before installation of perimeter framing members.
 - 2. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.

3.06 BOARD INSTALLATION

- A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
- C. Double-Layer, Nonrated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Use glass mat faced gypsum board at exterior walls and at other locations as indicated. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.
- D. Fire-Resistance-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
- E. Mold Resistant Gypsum Board: Use at all wall and ceiling surfaces in toilet rooms, janitor closets, laundry rooms, kitchens, and similar wet areas not indicated to receive wall tile.
 - 1. At single plumbing fixtures locations: Install from floor to 24 inches vertically above fixture and 12 inches horizontally past edge of fixture.
- F. Tile Backer Board: Install at all locations scheduled to receive tile. Seal all joints penetrations through backer board with sealant. Install in accordance with ANSIO A108.11 and manufacturer's instructions.
- G. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of nonrated double-layer assemblies, which may be installed by means of adhesive lamination.
- H. Moisture Protection: Treat cut edges and holes in moisture resistant gypsum board and exterior gypsum soffit board with sealant.

3.07 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
 - 1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
 - 2. Not more than 30 feet apart on ceiling over 50 feet long and/or where framing changes directions.
 - 3. At exterior soffits, not more than 30 feet apart in both directions.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.
- D. Exterior Soffit Vents: Install according to manufacturer's written instructions and in locations indicated on the drawings. Provide vent area specified or no less than 1/150 of area vented.

3.08 JOINT TREATMENT

- A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, embed and finish with setting type joint compound.
- B. Paper Faced Gypsum Board: Use paper joint tape, embed with drying type joint compound and finish with drying type joint compound.
- C. 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, walls behind specialty dry-erase coatings and other areas specifically indicated.
 - 2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
 - 3. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
 - 4. Level 1: Wall areas above finished ceilings, whether or not accessible in the completed construction. Installation must conform to UL or STC ratings at Fire Rated and Acoustical Partitions.
- D. 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.
 - 2. Taping, filling, and sanding are not required at surfaces behind adhesive applied ceramic tile and fixed cabinetry.
 - 3. Taping, filling and sanding is not required at base layer of double layer applications, unless required by UL fire resistance rating.
- E. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.09 QUALITY CONTROL

- A. Prior to installation of wall board on stud walls, coordinate review with Architect and AHJ inspections and approvals.
- B. Prior to covering up with suspended ceilings, coordinate above ceiling review with Architect. Review to observe installation of acoustical sealant, fire wall installation and labels, mechanical equipment installation and clearances, etc. Coordinate with AHJ inspections and approvals.

3.10 TOLERANCES

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

**SECTION 09 3000
TILING**

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

- A. Tile for floor and wall applications.
- B. Backer board as tile substrate.
- C. Ceramic accessories, ceramic and non-ceramic trim.

1.02 REFERENCE STANDARDS

- A. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2014.
- B. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).
- C. ANSI A108.1c - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set or Latex-Portland Cement; 1999 (Reaffirmed 2010).
- D. ANSI A108.2 - American National Standard General Requirements: Materials, Environmental and Workmanship; 2019.
- E. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 2009 (Revised).
- F. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).
- G. 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).
- H. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (Reaffirmed 2010).
- I. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 1999 (Reaffirmed 2010).
- J. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 1999 (Reaffirmed 2010).
- K. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2010 (Reaffirmed 2016).
- L. ANSI A108.19 - American National Standard Specifications for Interior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs by the Thin-Bed Method Bonded with Modified Dry-Set Cement Mortar or Improved Modified Dry-Set Cement Mortar; 2017.
- A. ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium).; 2017.
- B. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar; 2012 (Revised).
- C. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2013.1.
- D. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2013.
- E. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2011.
- F. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2015.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by affected installers. Have all materials to be used in installation at jobsite for observation.

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. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details, and TCNA installation method details.
- D. Samples: Mount tile and apply grout on two plywood panels, minimum 18 x 18 inches in size illustrating pattern, color variations, and grout joint size variations. Provide sample boards of tile color ranges for selection.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- F. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.
- G. 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 Tile: 1 percent of each size, color, and surface finish combination but not less than 10 of each type.

1.05 MOCK-UP

- A. Construct tile mock-up where indicated on drawings, incorporating all components specified for the location.
 - 1. Minimum size of mock-up is indicated on drawings.
 - 2. Approved mock-up may remain as part of the Work.

1.06 DELIVERY, STORAGE, AND HANDLING

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

1.07 FIELD CONDITIONS

- A. Do not install solvent-based products in an unventilated environment.
- B. Maintain ambient and substrate temperature above 50 degrees F and below 100 degrees F during installation and curing of setting materials.

PART 2 PRODUCTS

2.01 TILE

- A. Glazed Ceramic Wall Tile, Type CRT-01: ANSI A137.1, standard grade.
 - 1. Manufacturer: Daltile, (www.daltile.com).
 - 2. Product:
 - a. CRT-01: Linear Color Wheel Collection
 - 1) Color - Arctic White 0190
 - 3. Size: 4 by 12 inch, nominal.
 - 4. Thickness: 3/8 inch.
 - 5. Surface Finish: Semi-Gloss.
- B. Glazed Ceramic Wall Tile, Type CRT-02 and CRT-03: ANSI A137.1, standard grade.
 - 1. Manufacturer: Daltile, (www.daltile.com).
 - 2. Product:
 - a. CRT-02: Classic Color Wheel Collection
 - 1) Color - Galaxy 1469

- b. CRT-03: Classic Color Wheel Collection
 - 1) Color - Wood Violet 1457
 - 3. Size: 4 by 4 inch, nominal.
 - 4. Thickness: 5/16 inch.
 - 5. Surface Finish: High gloss.
- C. Porcelain Tile, Type PCT-01: ANSI A137.1 standard grade.
 - 1. Manufacturer: Concepts Surface (www.conceptsurfaces.com).
 - 2. Product:
 - 3. PCT-01: Elements
 - a. Color: Zinc
 - b. Size: 12 by 24
 - 4. Thickness: 3/8 inch.
 - 5. Edges: Rectified.
 - 6. Surface Finish: Matte.

2.02 TRIM AND ACCESSORIES

- A. Ceramic Accessories: Glazed finish, same color and finish as adjacent field tile; same manufacturer as tile.
- B. Non-Ceramic Trim: Satin natural anodized extruded aluminum, style and dimensions to suit application, for setting using tile mortar or adhesive.
 - 1. Applications:
 - a. Open edges of wall tile where specified on drawings.
 - b. Transition between floor finishes of different heights.
 - 2. Manufacturers:
 - a. Schluter-Systems: www.schluter.com. Schiene and Quadec.
 - b. Genesis APS International: www.genesis-aps.com/#sle.
 - c. Substitutions: See Section 01 6000 - Product Requirements.

2.03 SETTING MATERIALS

- A. Provide setting materials made by the same manufacturer as grout.
 - 1. Manufacturers:
 - a. Custom Building Products; _____: www.custombuildingproducts.com/#sle.
 - b. LATICRETE International, Inc; _____: www.laticrete.com/#sle.
 - c. Substitutions: See Section 01 6000 - Product Requirements.
 - 2. Improved Latex-Portland Cement Mortar Bond Coat: ANSI A118.15.
 - a. Products:
 - 1) Custom Building Products; MegaLite Ultimate Crack Prevention Large Format Tile Mortar: www.custombuildingproducts.com/#sle.
 - 2) LATICRETE International, Inc; LATICRETE 254 Platinum: www.laticrete.com/#sle.

2.04 GROUTS

- A. Provide setting and grout materials from same manufacturer.
- B. Manufacturers:
 - 1. Custom Building Products: www.custombuildingproducts.com/#sle.
 - 2. LATICRETE International, Inc: www.laticrete.com/#sle.
- C. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
 - 1. Applications: All locations.
 - 2. Color(s): As selected by Architect from manufacturer's full line.
 - 3. Products:
 - a. Custom Building Products; CEG-Lite: www.custombuildingproducts.com.
 - b. LATICRETE International, Inc; LATICRETE SPECTRALOCK PRO Premium Grout: www.laticrete.com/#sle.

- c. Substitutions: See Section 01 6000 - Product Requirements.

2.05 ACCESSORY MATERIALS

- A. Waterproofing Membrane at Floors and Walls: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
 - 1. Crack Resistance: No failure at 1/16 inch gap, minimum; comply with ANSI A118.12.
 - 2. Fluid or Trowel Applied Type:
 - a. Material: Synthetic rubber or Acrylic.
 - b. Thickness: 25 mils, minimum, dry film thickness.
 - c. Products:
 - 1) Custom Building Products; RedGard Crack Prevention and Waterproofing Membrane: www.custombuildingproducts.com/#sle.
 - 2) LATICRETE International, Inc; LATICRETE HYDRO BAN: www.laticrete.com/#sle.
 - 3) MAPEI Corporation; Mapelastic 400.
- B. Backer Board: Cementitious type complying with ANSI A118.9; high density, glass fiber reinforced, 1/2 inch thick; 2 inch wide coated glass fiber tape for joints and corners.
- C. Backer Board: Coated glass mat type complying with ASTM C1178/C1178M; inorganic fiberglass mat on both surfaces and integral acrylic coating vapor retarder.
 - 1. Standard Type: Thickness 1/2 inch.
 - 2. Fire Resistant Type: Type X core, thickness 5/8 inch.
- D. Mesh Tape: 2 inch wide self-adhesive fiberglass mesh tape.
- E. Self Leveling underlayment System: Cement based underlayment and primer.
 - 1. Laticrete International; Level & Primer: www.laticrete.com.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.
- C. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.
- D. Cementitious Subfloor Surfaces: Verify that substrates are ready for tiling installation by testing for moisture and alkalinity (pH).
 - 1. Test as Follows:
 - a. Alkalinity (pH): ASTM F710.
 - b. Internal Relative Humidity: ASTM F2170.
 - c. Moisture Vapor Emission: ASTM F1869.
 - 2. Obtain instructions if test results are not within limits recommended by tiling material manufacturer and setting material manufacturer.
- E. Verify that required floor-mounted utilities are in correct location.

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. Use self-level
- 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.

- E. Blending: For tile exhibiting color variations within ranges selected during Sample submittals, verify that tile has been factory blended and packaged so tile units taken from one package show same range of color as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installation.
- F. Field-Applied Temporary Protective Coating: Where indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protect coating, taking care not to coat unexposed tile surfaces.

3.03 INSTALLATION - GENERAL

- A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.19 , manufacturer's instructions, and TCNA (HB) recommendations.
- B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings, unless otherwise noted.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- D. Jointing Pattern: Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.
 - 1. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Layout tile work and center tile fields in both directions in each wall area.
 - 2. Adjust tile to align with expansion joints in slabs and to minimize tile cutting.
 - 3. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
- E. Expansion Joints: Locate sealant filled expansion control, contraction and isolation joints directly over existing joints during installation of setting materials, mortar beds and tile, except where permitted otherwise. Do not saw-cut joints after installing tiles.
 - 1. Locate joints in tile surfaces directly above joints in concrete surfaces or provide crack isolation membrane to realign joint. Reference details on drawings.
 - 2. Keep expansion joints free of adhesive or grout. Apply sealant to joints.
- F. Cap tile wainscots with bullnose trim matching wall tile. If bullnose trim is not available, provide aluminum trim or as indicated on drawings.
- G. Form internal angles square and external angles bullnosed.
- H. Install ceramic accessories rigidly in prepared openings.
- I. Install non-ceramic trim in accordance with manufacturer's instructions.
- J. Sound tile after setting. Replace hollow sounding units.
- K. Keep control and expansion joints free of mortar, grout, and adhesive.
- L. Keep expansion joints free of adhesive or grout. Apply sealant to joints.
- M. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- N. Grout tile joints. Grout to comply with ANSI A108.10 tile installation standards.
- O. 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.
- P. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes. Apply sealant at corners of intersecting tile surfaces.

3.04 INSTALLATION - FLOORS & WALLS - WATERPROOF & CRACK-SUPPRESSION MEMBRANE

- A. Install waterproofing and crack-suppression membrane to comply with ANSI A108.13 and membrane manufacturer's written instructions to produce membrane of uniform thickness bonded securely to substrate.

- B. Do not install tile over waterproofing and crack suppression membrane until membrane has cured and been tested to determine that it is water tight.
- C. Install waterproofing and crack suppression membrane below all ceramic tile at locations indicated. Note full-coverage embedded fabric reinforcement required regardless of manufacturer / product used.
 - 1. Provide at Shower Rooms, toilet rooms, restrooms, laundry rooms, janitor closets, kitchens and/or similar wet locations scheduled to receive tile.
- D. Install waterproofing membrane underneath prefinished plumbing fixtures and/or units such as shower pans, shower units, hot tubs, toilets, mop sinks, sink basins, or similiar large floor mounted fixtures. Membrane to seal tight to all floor penetrations and piping to create complete waterproof assembly.
- E. Install waterproofing membrane vertically on all walls a minimum of 4 inches around entire perimeter of rooms. Extend membrane vertically on wall surfaces beneath wall tile of showers and pre-made shower units to ensure water tight system.

3.05 INSTALLATION - FLOORS - THIN-SET METHODS

- A. Over exterior concrete substrates, install in accordance with TCNA (HB) Method F102, with epoxy grout.
- B. Over interior concrete substrates, install in accordance with The Tile Council of North America Handbook Method F122, using waterproof membrane, thin-set latex-portland cement bond coat with epoxy grout.

3.06 INSTALLATION - WALL TILE

- A. On exterior walls install in accordance with The Tile Council of North America Handbook Method W244, thin-set over cementitious backer units, with waterproofing membrane, with epoxy grout.
- B. Over interior walls on cementitious backer units on studs, install in accordance with The Tile Council of North America Handbook Method W244 using membrane where indicated, thin-set latex-Portland cement bond coat with epoxy grout.
- C. Over interior concrete and masonry install in accordance with The Tile Council of North America Handbook Method W202, thin-set with dry-set or latex-Portland cement bond coat on waterproof membrane where indicated, with epoxy grout.
- D. At glass tile installations: Over interior walls on cementitious backer units, install in accordance with the TCNA Handbook method W244C using white Glass Tile Adhesive with epoxy grout. Verify tile adhesive with glass tile manufacturer.

3.07 CLEANING

- A. Clean tile and grout surfaces.
- B. Clean and remove all residue from epoxy grout from surfaces of tile. Use professional cleaning solutions as required.

3.08 PROTECTION

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

END OF SECTION

**SECTION 09 5100
ACOUSTICAL CEILINGS**

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

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

1.02 REFERENCE STANDARDS

- A. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- B. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.
- C. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2013a.
- D. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2013.
- E. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2014.
- F. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2014.
- G. UL (FRD) - Fire Resistance Directory; current edition.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
- B. Do not install acoustical units until after interior wet work is dry.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate grid layout and related dimensioning.
- C. Product Data: Provide data on suspension system components and acoustical units.
- D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- 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 Acoustical Units: Quantity equal to 5 percent of total installed. Provide at a minimum 1 box or carton of ceiling tile.

1.05 QUALITY ASSURANCE

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

1.06 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:

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1. Armstrong World Industries, Inc: www.armstrongceilings.com/#sle.
2. CertainTeed Corporation: www.certainteed.com/#sle.
3. USG Corporation: www.usg.com/ceilings/#sle.
4. Fresch: frasch.com.
5. Substitutions: See Section 01 6000 - Product Requirements.

- B. Suspension Systems:
1. Same as for acoustical units.

2.02 ACOUSTICAL UNITS

- A. Acoustical Units - General: ASTM E1264, Class A.
- B. Acoustical Tiles, Type ACT-1: Painted mineral fiber, with the following characteristics:
1. Classification: ASTM E1264 Type III.
 2. Size: 24 by 24 inches.
 3. Thickness: 1 inches.
 4. Composition: Wet-formed mineral fiber with DuraBrite acoustically transparent membrane.
 5. Light Reflectance: 85 percent, determined in accordance with ASTM E1264.
 6. NRC Range: .85, determined in accordance with ASTM E1264.
 7. Ceiling Attenuation Class (CAC): 35, determined in accordance with ASTM E1264.
 8. Panel Edge: Beveled Tegalur.
 9. Surface Pattern: Fine Texture.
 10. Tile Edge: Beveled.
 - a. Joint: Kerfed and rabbeted.
 11. Color: White.
 12. Suspension System: Prelude by Armstrong.
 13. Products:
 - a. Armstrong World Industries, Inc; Ultima High NRC 2080: www.armstrongceilings.com/#sle.

2.03 ACOUSTIC PANEL WITH LINEAR WOOD SLATS

- A. Acoustical Panels: WoodWorks Linear Veneered Open by Armstrong, with the following characteristics:
1. Classification: ASTM E795 Mounting - Type A.
 2. Surface Texture: Smooth.
 3. Composition: Real wood veneer on fire rated particle board.
 4. Size: 4 by 96 inches. With 3/4" reveal Plank to Plank @ width.
 5. Thickness: 0.75 inches
 6. Acoustical performance infill options: BioAcoustic Infill Panels - Item 5823.
 7. Panel Edge: TBD.
 8. Color: TBD.
 9. Mounting: Manufacturer's recommended suspension system.

2.04 SUSPENSION SYSTEM(S)

- A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold down clips, stabilizer bars, clips, and splices as required.
- B. Exposed Suspension System: Hot-dipped galvanized steel grid.
1. Structural Classification: Heavy-duty, when tested in accordance with ASTM C635/C635M.
 2. Profile: Tee; 15/16 inch face width.
 3. Finish: Baked enamel.
 4. Products:
 - a. Armstrong: Prelude XL 15/16" Exposed Tee.. www.armstrongceilings.com.
 - b. Substitutions: See Section 01 6000 - Product Requirements.

2.05 ACCESSORIES

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.
- B. Hanger Wire: 12-gage 0.08 inch galvanized steel wire.
- C. Perimeter Moldings: Same metal and finish as grid.
 - 1. Angle Molding: L-shaped, for mounting at same elevation as face of grid.
- D. Gypsum Board: Fire rated type; 5/8 inch thick, ends and edges square, paper faced.
- E. Acoustical Sealant For Perimeter Moldings: Specified in Section 07 9005.
- F. Touch-up Paint: Type and color to match acoustical ceiling tiles and grid units.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 INSTALLATION - SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, ASTM C636/C636M, ASTM E580/E580M, ASTM C636/C636M, and ASTM E580/E580M and as supplemented in this section.
- B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- C. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 - 1. Use longest practical lengths.
- D. Suspension System, Non-Seismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- E. 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.
- F. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- G. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
- H. Do not eccentrically load system or induce rotation of runners.

3.03 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Fit border trim neatly against abutting surfaces.
- D. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- E. Cutting Acoustical Units:
 - 1. Make field cut edges of same profile as factory edges.
 - 2. Double cut and field paint exposed reveal edges.
- F. Where round obstructions occur, provide preformed closures to match perimeter molding.
- G. At partitions that extend only to underside of ceiling grid, lay acoustical insulation for a distance of 48 inches either side of acoustical partitions.

- H. Install hold-down clips on each panel to retain panels tight to grid system; comply with fire rating requirements.

3.04 TOLERANCES

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

END OF SECTION

**SECTION 09 6500
RESILIENT FLOORING**

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

- A. Resilient tile and sheet flooring.
- B. Resilient base.
- C. Installation accessories.

1.02 REFERENCE STANDARDS

- A. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.
- B. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile; 2004 (Reapproved 2014).
- C. ASTM F1861 - Standard Specification for Resilient Wall Base; 2008 (Reapproved 2012).
- D. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2011.
- E. ASTM F2169 - Standard Specification for Resilient Stair Treads; 2015.
- F. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2011.
- G. BAAQMD 8-51 - Bay Area Air Quality Management District Regulation 8, Rule 51, Adhesive and Sealant Products; www.baaqmd.gov; 2002.
- H. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; Resilient Floor Covering Institute; October 2011.
- I. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.

1.03 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. Shop Drawings: Indicate seaming plans and floor patterns.
- D. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
- E. Mockup: may be required from installer to convey installation of components with accessories.
- F. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of subfloor is acceptable.
- G. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
- H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Extra Flooring Material: 10 percent or 45 square feet of each type and color.
 - 3. Extra Wall Base: 20 linear feet of each type and color.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Protect roll materials from damage by storing on end.

1.05 FIELD CONDITIONS

- A. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

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

PART 2 PRODUCTS

2.01 SHEET FLOORING

- A. Vinyl Sheet Flooring - Type SV-01: Homogeneous without backing, with color and pattern throughout full thickness. Dual-durometer foam-backed sheet vinyl flooring designed for fully adhered athletic flooring applications.
 - 1. Manufacturers:
 - a. Gerflor, Taraflex Sports Flooring; Sports M Plus: www.gerflorusa.com.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
 - 2. Minimum Requirements: Comply with ASTM F1913.
 - 3. Overall Thickness: Not less than 0.3 inch (7.5mm).
 - 4. Wear-Layer Thickness: Not less than 0.080 inch (2.1mm) nominal.
 - 5. Backing: Very high density, two layer, dual-durometer, closed cell foam.
 - 6. Adhesive Method: Full-spread adhesive coverage to completely adhere flooring to substrate.
 - 7. Traffic-Surface Texture: Wood visual shall have wood grain embossed texture for a genuine wood appearance.
 - 8. Applied Finish: Manufacturer's, factory-applied, permanent and UV-cured.
 - 9. Sheet Width: 59 inch minimum.
 - 10. Sheet Length: Wood Visual rolls to be a minimum length of 86 feet, 6 inches to minimize the number of end-seams.
 - 11. Seams: Heat welded.
 - 12. Pattern: 7019 Wood Crosscut.
- B. Welding Rod: Solid bead in material compatible with flooring, produced by flooring manufacturer for heat welding seams, and in color matching field color.

2.02 TILE FLOORING

- A. PVC-Free Resilient Tile - Type LVT-01: Mineral and thermoplastic polymer construction; ionomer-impregnated wear surface.
 - 1. Manufacturers:
 - a. Patcraft; Basis of Design: www.patcraft.com.
 - b. Shaw Contract: www.shawcontract.com.
 - c. Mohawk Group: www.mohawkgroup.com.
 - d. Substitutions: See Section 01 6000 - Product Requirements.
 - 2. Plank Tile Size: 15.67 by 30.71 inch.
 - 3. Thickness: 0.098 inch nominal.
 - 4. Pattern: Rematerial I786V.
 - 5. Color: To be selected by Architect from manufacturer's full range.
- B. PVC-Free Resilient Tile - Type LVT-02: Mineral and thermoplastic polymer construction; ionomer-impregnated wear surface.
 - 1. Manufacturers:
 - a. Patcraft; Basis of Design: www.patcraft.com.
 - b. Shaw Contract: www.shawcontract.com.
 - c. Mohawk Group: www.mohawkgroup.com.
 - d. Substitutions: See Section 01 6000 - Product Requirements.
 - 2. Plank Tile Size: 13 by 26 inch.
 - 3. Thickness: 0.098 inch nominal.
 - 4. Pattern: Meaning II Plank I719V.
 - 5. Color: To be selected by Architect from manufacturer's full range.
- C. Rubber Tile - Type RBT-01: Homogeneous, color and pattern throughout thickness.

1. Manufacturers:
 - a. Nora by Interface (www.nora.com/united-states).
 - b. Substitutions: See Section 01 6000 - Product Requirements.
2. Minimum Requirements: Comply with ASTM F1344, of Class corresponding to type specified.
3. Product Name: Norament, Kivo 2.7 mm.
4. Color:
 - a. RBT-01: 5362 Flint
5. Size: 39.53 in by 39.53 in.
6. Total Thickness: 2.7mm.
7. Surface: Two tone.
8. Back of Tile: Double-sanded smooth.
9. Material Composition: Nora vulcanized rubber compound 926 with environmentally compatible color pigments that are free of toxic heavy metals like lead, cadmium, or mercury.
10. Construction: Homogeneous rubber compound with random scattered design.
11. Limited Wear Warranty: 15 years.

2.03 RESILIENT BASE

- A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set RBB-01.
 1. Manufacturers:
 - a. Johnsonite, a Tarkett Company; _____: www.johnsonite.com/#sle.
 2. RBB-01: Johnsonite Millwork Wall Base System.
 3. Product: Monument MW-XX-S4.
 4. Height: 4 inch.
 5. Thickness: 0.25 inch.
 6. Finish: Satin.
 7. Length: 8 foot sections.
 8. Color: TBD
- B. Resilient Base: ASTM F1861, Type TS Thermoset Rubber Base, RBB-02.
 1. Product: Traditional Cove Base.
 2. Height: 4 inch.
 3. Thickness: 0.45 inch
 4. Finish: Satin.
 5. Length: Rolled goods only.
 6. Color: TBD.

2.04 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
- B. Leveling and Patching compound: As recommended by flooring manufacturer.
- C. Moisture Membrane: As required or recommended by flooring manufacturer.
- D. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer based on application type.
 1. Provide only products having lower volatile organic compound (VOC) content than required by the more stringent of the South Coast Air Quality Management District Rule No.1168 and the Bay Area Air Quality Management District Regulation 8, Rule 51.
 2. Provide product compatible with concrete subfloor relative humidity and ph levels.
- E. Moldings, Transition and Edge Strips: Metal, stainless steel or anodized aluminum.
 1. Products: Schluter Systems; Schiene, Deco or Reno style trim.
- F. Filler for Coved Base: Plastic.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
- B. 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.
- C. Cementitious Sub-floor Surfaces: Verify that substrates have fully cured and ready for resilient flooring installation by testing for moisture, pH and compression strength.
 - 1. Test as Follows:
 - a. Alkalinity (pH): ASTM F710.
 - b. Internal Relative Humidity: ASTM F2170.
 - c. Moisture Vapor Emission: ASTM F1869.
 - 2. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
 - 3. Verify cementitious sub-floor and any fillers have reached minimum 3000 psi strength.

3.02 PREPARATION

- A. Prepare floor substrates as recommended by flooring and adhesive manufacturers. Remove curing compounds, surface hardeners or other chemicals that may interfere with adhesive bonding. Where subfloor moisture levels are higher than acceptable installation range, prepare or condition space as necessary to permit installation. The use of moisture barrier membrane is acceptable.
- B. Remove subfloor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with subfloor filler to achieve smooth, flat, hard surface.
- C. Prohibit traffic until filler is fully cured.
- D. Clean substrate.

3.03 INSTALLATION - GENERAL

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install in accordance with manufacturer's written instructions.
- C. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door. Where flooring is similar, continue seamlessly through opening.
- D. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated. Provide nosings at corners of floor plane transitions such as at steps..
- E. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
- F. Install flooring in recessed floor access covers, maintaining floor pattern.
- G. At movable partitions, install flooring under partitions without interrupting floor pattern.
- H. Install feature strips where indicated.

3.04 INSTALLATION - SHEET FLOORING

- A. Lay flooring with joints and seams parallel to longer room dimensions, to produce minimum number of seams. Lay out seams to avoid widths less than 1/3 of roll width; match patterns at seams.
- B. Seal seams by heat welding where indicated.

3.05 INSTALLATION - TILE FLOORING

- A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.

- B. Lay flooring with joints and seams parallel to building lines to produce symmetrical pattern.
- C. Install tile to match patterns as indicated on drawings. Allow minimum 1/2 full size tile width at room or area perimeter.
- D. Install plank tile with a random offset of at least 6 inches from adjacent rows.

3.06 INSTALLATION - RESILIENT BASE

- A. Fit joints tightly and make vertical. Use coil stock when available and install in longest runs with minimal joints possible.
- B. Miter internal corners. At external corners, 'V' cut back of base strip to 2/3 of its thickness and fold. .
- C. Install base on solid backing. Bond tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.

3.07 CLEANING

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

3.08 PROTECTION

- A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

**SECTION 09 6816
CARPETING**

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

- A. Carpet tiles, direct-glued.
- B. Entrance Flooring / Walk off carpet.

1.02 REFERENCE STANDARDS

- A. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.
- B. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2011.
- C. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2011.
- D. CRI (GL) - Green Label Testing Program - Certified Products; Carpet and Rug Institute; Current Edition.
- E. CRI 104 - Standard for Installation of Commercial Carpet; 2015.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- C. Shop Drawings: Indicate seaming plan, method of joining seams, direction of carpet pile and pattern, location of edge moldings and edge bindings, layout of flat wire system.
- D. Samples: Submit two samples 24 by 24 inch in size illustrating color and pattern for each carpet and cushion material specified.
- E. Manufacturer's Installation Instructions: Indicate special procedures.
- F. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional requirements.
 - 2. Extra Carpet: 5 percent (minimum 50 sq ft) of each type, color, and pattern installed.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing carpet with minimum three years documented experience.

1.05 FIELD CONDITIONS

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.
- B. Maintain minimum 70 degrees F ambient temperature 24 hours prior to, during and 24 hours after installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Carpet:
 - 1. Patcraft; www.patcraft.com.
 - 2. Interface; www.interface.com.
 - 3. Mohawk Group; www.mohawkgroup.com/#sle.

4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 CARPET TILE

- A. Available Products: Manufacture and product noted are indicative of style, pattern and quality required. Subject to compliance with requirements, Contractor to submit a comparable product by this or another manufacturer meeting the requirements noted.
- B. Carpet Type CPT-01:
 1. Carpet tile as manufactured by Patcraft (www.patcraft.com).
 - a. Collection: Lithic
 - b. Style Number: I0683
 - c. Style Name: New Stone
 - d. Color: 00550 - Oscuro
 - e. Fiber Type: Ecosolutions Q100 Nylon
 2. Dye Method: 100% Solution Dyed.
 3. Finished Pile Thickness: 0.076 inch.
 4. Stitches: 7.5 per inch.
 5. Gauges: 1/10 inch.
 6. Tufted Weight: 28 oz./ yd.
 7. Primary Backing: Non-Woven Synthetic.
 8. Secondary Backing: Ecoworx Tile
 9. Size: 18 x 36 inches.
 10. Installation method: Ashlar.
- C. Carpet Type CPT-02:
 1. Carpet tile as manufactured by Interface (www.interface.com).
 - a. Collection: Stellar Horizons
 - b. Style Name: Lunar Landing
 - c. Style Number: 1408502500
 - d. Color: 108468 Midnight
 - e. Fiber Type: 100% Recycled Content Nylon
 2. Dye Method: 100% Solution Dyed.
 3. Finished Pile Thickness: 0.092 inch.
 4. Stitches: 8.0 per inch.
 5. Gauges: 1/10 inch.
 6. Tufted Weight: 25 oz./ yd.
 7. Primary Backing: GlasBac.
 8. Size: 19.69 in x 19.69 in.
 9. Installation method: Monolithic.
- D. Carpet Type CPT-03:
 1. Carpet tile as manufactured by Interface (www.interface.com).
 - a. Collection: Crafted Connections
 - b. Style Name: Thread Lighty
 - c. Style Number: 1270302500
 - d. Color: 108556 Linen/Lilac
 - e. Fiber Type: 100% Recycled Content Nylon
 2. Dye Method: 100% Solution Dyed
 3. Finished Pile Thickness: 0.068 inch.
 4. Stitches: 13.3 per inch.
 5. Tufted Weight: 21 oz./ yd.
 6. Primary Backing: GlasBac.
 7. Size: 19.69 in x 19.69 in.
 8. Installation method: Monolithic.
- E. Warranties: Manufacturers Lifetime Commercial Warranty.

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CARPETING
DESIGN DEVELOPMENT
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2.03 ENTRANCE FLOORING / WALK OFF CARPET

- A. Available Products: Manufacture and product noted are indicative of style, pattern and quality required. Subject to compliance with requirements, Contractor to submit a comparable product by this or another manufacturer meeting the requirements noted.
- B. Carpet Type WKC:-
 - 1. Carpet Tile as manufactured by Mannington.
 - a. Color: to be selected by Architect from Manufacturer's full range.
 - b. Fiber type: Type 6, 6 Postproduction Nylon and Scraper Fiber Type 6,6.
 - 2. Surface Texture: Tip-Sheared Loop
 - 3. Finished Pile Thickness: 0.161 Inches.
 - 4. Stitches: 13.83 stitches per inch
 - 5. Gauge: 1/12
 - 6. Face Weight: 32 oz / sq.yd.
 - 7. Primary Backing: 100% woven synthetic
 - 8. Primary Pre-coat: 100% Non-Aqueous Closed Cell Polymer with recycled content, Providing Lifetime Warranty against Stain Wick-Back.
 - 9. Secondary Backing: Infinity RE Modular Reinforced Composite Closed Cell Polymer with Recycled Content.
 - 10. Standard Size: 24 Inches x 24 Inches Modular Tile.
 - 11. Installation Method: Quarter Turn Only; Other Methods at Owner's Discretion.
 - 12. Releasable Adhesive: Mannington Infinity pressure sensitive adhesive.
- C. Performance Characteristics:
 - 1. Flammability: Passes DOC-FF-1-70 Pill Test.
 - 2. Flooring Radiant Panel Test: Meets NFPA Class 1 when tested under ASTM E-648 glue down.
- D. Warranties: Manufacturers Limited Lifetime Warranty.

2.04 ACCESSORIES

- A. Subfloor Filler: Type recommended by carpet manufacturer.
- B. Moldings, Transitions and Edge Strips: Metal, stainless steel or anodized aluminum.
 - 1. Product: Schluter Systems: Schiene, Deco or Reno profiles.
- C. Adhesives - General: Compatible with materials being adhered; maximum VOC content of 50 g/L; CRI Green Label certified; in lieu of labeled product, independent test report showing compliance is acceptable.
- D. Seam Adhesive: Recommended by manufacturer.
- E. Contact Adhesive: Compatible with carpet material ; releasable type.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive carpet.
- B. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesives to subfloor surfaces. Any surface contaminate must be removed prior to installation of new flooring surfaces.
- C. Cementitious Sub-floor Surfaces: Verify that substrates have fully cured and ready for flooring installation by testing for moisture, alkalinity (pH) and compression strength.
 - 1. Test as Follows:
 - a. Alkalinity (pH): ASTM F710.
 - b. Internal Relative Humidity: ASTM F2170.
 - c. Moisture Vapor Emission: ASTM F1869.

2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.
 3. Verify cementitious sub-floor and any fillers have reached minimum 3000 psi strength.
- D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

- A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- B. Remove subfloor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with subfloor filler.
- C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
- D. Vacuum clean substrate.

3.03 INSTALLATION - GENERAL

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install carpet and cushion in accordance with manufacturer's instructions and CRI 104 (Commercial).
- C. Verify carpet match before cutting to ensure minimal variation between dye lots. Blend carpets from different cartons as necessary to ensure minimal variation.
- D. Lay out carpet and locate seams in accordance with shop drawings.
 1. Locate seams in area of least traffic, out of areas of pivoting traffic, and parallel to main traffic.
 2. Do not locate seams perpendicular through door openings.
 3. Align run of pile in same direction as anticipated traffic and in same direction on adjacent pieces.
 4. Locate change of color or pattern between rooms under door centerline.
 5. Provide monolithic color, pattern, and texture match within any one area.
- E. Install carpet tight and flat on subfloor, well fastened at edges, with a uniform appearance.

3.04 DIRECT-GLUED CARPET

- A. Double cut carpet seams, with accurate pattern match. Make cuts straight, true, and unfrayed. Apply seam adhesive to cut edges of woven carpet immediately.
- B. Apply contact adhesive to floor uniformly at rate recommended by manufacturer. After sufficient open time, press carpet into adhesive.
- C. Apply seam adhesive to the base of the edge glued down. Lay adjoining piece with seam straight, not overlapped or peaked, and free of gaps.
- D. Roll with appropriate roller for complete contact of adhesive to carpet backing.
- E. Trim carpet neatly at walls and around interruptions.

3.05 CLEANING

- A. Remove excess adhesive from floor and wall surfaces without damage.
- B. Clean and vacuum carpet surfaces.
- C. Contractor is required to vacuum over trim seals with appropriate carpet scissors at carpet tile and trim all fibers that have bloomed or frayed.

END OF SECTION

**SECTION 09 7200
WALL COVERINGS**

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

- A. Surface preparation and prime painting.
- B. Wall covering and borders.

1.02 REFERENCE STANDARDS

- A. ASTM D1308 - Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes; 2002 (Reapproved 2013).
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- C. ASTM F793/F793M - Standard Classification of Wall Coverings by Use Characteristics; 2015.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on wall covering and adhesive.
- C. Shop Drawings: Indicate wall elevations with seaming layout.
- D. Test Reports: Indicate verification of flame and smoke ratings, when tested by UL.
- E. Manufacturer's Installation Instructions: Indicate special procedures.
- F. Maintenance Data: Submit data on cleaning, touch-up, and repair of covered surfaces.
- G. 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 Covering Materials: 30 linear feet (or min. 5%) of each color and pattern of wall covering; store where directed.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Inspect roll materials at arrival on site, to verify acceptability.
- B. Protect packaged adhesive from temperature cycling and cold temperatures.
- C. Do not store roll goods on end.

1.06 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the adhesive or wall covering product manufacturer.
- B. Maintain these conditions 24 hours before, during, and after installation of adhesive and wall covering.

PART 2 PRODUCTS

2.01 WALL COVERINGS

- A. General Requirements:
 - 1. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84.
 - 2. Chemical and Stain Resistance: No visible staining or discoloration and no damage to surface texture when tested in accordance with ASTM D1308.

- B. Wall Covering: VWC: complying with the following:
 - 1. Total Thickness: .032" +/- .003" (.83 mm +/- .05mm) mil.
 - 2. Total Density: 64.9 lb/ft³.
 - 3. Sheet Size: 4x8 feet.
 - 4. Color: Essential, AD-A02015.
 - 5. Pattern: EKOA.
 - 6. Backer: Cellulosic Backer.
- C. Adhesive: Type recommended by wall covering manufacturer to suit application to substrate.
- D. Substrate Filler: As recommended by adhesive and wall covering manufacturers; compatible with substrate.
- E. Substrate Primer and Sealer: Alkyd enamel type.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces are prime painted and ready to receive work, and comply with requirements of wall covering manufacturer.
- B. Measure moisture content of surfaces using an electronic moisture meter. Do not apply wall coverings if moisture content of substrate exceeds level recommended by wall covering manufacturer.
- C. Verify flatness tolerance of surfaces does not vary more than 1/8 inch in 10 feet nor vary at a rate greater than 1/16 inch/ft.

3.02 PREPARATION

- A. Fill cracks in substrate and smooth irregularities with filler; sand smooth.
- B. Finish surface of gypsum board to level as required by wallcovering manufacturer and per spec 09 2116. Wallcoverings may require Level 5 finish prior to installation.
- C. Wash impervious surfaces with tetra-sodium phosphate, rinse and neutralize; wipe dry.
- D. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
- E. Surfaces: Correct defects and clean surfaces that affect work of this section. Remove existing coatings that exhibit loose surface defects.
- F. Marks: Seal with shellac those that may bleed through surface finishes.
- G. Apply one coat of primer sealer to substrate surfaces. Allow to dry. Lightly sand smooth.
- H. Vacuum clean surfaces free of loose particles.

3.03 INSTALLATION

- A. Apply adhesive and wall covering in accordance with manufacturer's instructions.
- B. Apply adhesive to wall surface immediately prior to application of wall covering.
- C. Apply wall covering smooth, without wrinkles, gaps or overlaps. Eliminate air pockets and ensure full bond to substrate surface.
- D. Butt edges tightly.
- E. Horizontal seams are not acceptable.
- F. Do not seam within 2 inches of internal corners or within 6 inches of external corners.
- G. Install wall covering before installation of bases and items attached to or spaced slightly from wall surface.
- H. Cover spaces above and below windows, above doors, in pattern sequence from roll.
- I. Where wall covering tucks into reveals, or metal wallboard or plaster stops, apply with contact adhesive within 6 inches of wall covering termination. Ensure full contact bond.

- J. Remove excess adhesive while wet from seam before proceeding to next wall covering sheet.
Wipe clean with dry cloth.

3.04 CLEANING

- A. Clean wall coverings of excess adhesive, dust, dirt, and other contaminants.
- B. Reinstall wall plates and accessories removed prior to work of this section.

3.05 PROTECTION

- A. Do not permit construction activities at or near finished wall covering areas.

END OF SECTION

**SECTION 09 9113
EXTERIOR PAINTING**

PART 1 GENERAL V.23

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, ledge angles, and exterior primed or unfinished metals.
 - 2. Mechanical and Electrical:
 - a. On the roof and outdoors, paint equipment that is exposed to weather or to view, including factory-finished materials.
- D. Do Not Paint or Finish the Following Items:
 - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
 - 5. Non-metallic roofing and flashing.
 - 6. Stainless steel, anodized aluminum, bronze, terne coated stainless steel, zinc, and lead.
 - 7. Floors, unless specifically indicated.
 - 8. Ceramic and other types of tiles.
 - 9. Brick, glass unit masonry, architectural concrete, cast stone, integrally colored plaster and stucco.
 - 10. Exterior insulation and finish system (EIFS).
 - 11. Glass.
 - 12. Concealed pipes, ducts, and conduits.

1.02 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2014.
- C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 2007.
- D. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition, www.paintinfo.com.
- E. SSPC-SP 1 - Solvent Cleaning; 2015.
- F. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).
- G. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

1.03 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.
 4. Manufacturer's installation instructions.
- C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
1. Where sheen is specified, submit samples in only that sheen.
- D. Manufacturer's Instructions: Indicate special surface preparation procedures.
- 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.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum five (5) years experience.
- C. Provide field testing for adhesion per ASTM D4551 for paint applied to steel and galvanized steel surfaces in locations directed by Architect, quantity of 2 locations.

1.05 MOCK-UP

- A. Locate where directed by Architect.
- B. Mock-up may remain as part of the work.

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. Minimum Application Temperatures for Latex Paints: 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
- D. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

1.08 WARRANTY

- A. See section 01 7800 for CLOSEOUT SUBMITTALS, for additional warranty requirements.
- B. Manufacturers Requirements: Provide standard manufacturers warranty.
- C. Installers Requirements: Provide guarantee that surface cleaning and preparation has been performed as specified and that product(s) specified have been used at specified application. Provide 5 year warranty for installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.
- B. Paints:
 - 1. Base Manufacturer: Sherwin Williams.
 - 2. Behr Process Corporation: www.behr.com/#sle.
 - 3. PPG Paints: www.ppgpaints.com/#sle.
 - 4. Sherwin-Williams Company: www.sherwin-williams.com/#sle.

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. 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.
 - 3. Supply each paint material in quantity required to complete entire project's work from a single production run.
 - 4. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
- B. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.
- C. Colors: As indicated in Color Schedule.
 - 1. Extend colors to surface edges; colors may change at any edge as directed by Architect.

2.03 PAINT SYSTEMS - EXTERIOR

- A. Paint WE-OP-3L - Wood, Opaque, Latex, 3 Coat:
 - 1. One coat of latex primer sealer, all side of wood surfaces.
 - 2. On backside of concealed wood trim: One coat of latex primer sealer.
 - 3. Semi-gloss: Two coats of latex enamel.
- B. Paint CE-OP-3L - Masonry/Concrete, Opaque, Latex, 3 Coat:
 - 1. One coat of block filler. Sherwin Williams Loxon Block Surfacer A24W200, coordinate requirements with coating manufacturer.
 - 2. Concrete and Masonry Coatings per Section 09 9723.
- C. Paint GE-OP-3L - Exterior Gypsum Board and Exterior Plaster, Opaque, Latex, 3 Coat:
 - 1. One coat of latex primer sealer. Loxon Concrete & Masonry Primer Sealer, A24W8300
 - 2. Flat: Two coats of latex; A-100 Exterior Latex Flat, A6 Series.
- D. Paint ME-OP-3A - Ferrous Metals, Unprimed, Acrylic, 3 Coat:
 - 1. One coat of acrylic primer. Sherwin Williams B66-310 Series
 - 2. Semi-gloss: Two coats of acrylic enamel; Sherwin Williams B66-650 Series.
- E. Paint ME-OP-3B - Ferrous Metals, Unprimed, Acrylic, 2 Coat: Exposed Exterior Structural Steel
 - 1. Touch Up of manufacturer acrylic primer: As recommended by Tnemec
 - 2. Semi-gloss: Two coats of HDP acrylic enamel; Tnemec Enduratone Series 1029.
- F. Paint ME-OP-2A - Ferrous Metals, Primed, Acrylic, 2 Coat:
 - 1. Touch-up with rust-inhibitive primer recommended by top coat manufacturer.
 - 2. Semi-gloss: Two coats of acrylic enamel; Sherwin Williams B66-650 Series.
- G. Paint MgE-OP-3A - Galvanized Metals, Acrylic, 3 Coat:
 - 1. One coat galvanize primer.
 - 2. Semi-gloss: Two coats of acrylic enamel; Sherwin Williams B66-650 Series.

- H. Paint MgE-OP-3X - Exterior Metal Handrails & Door Frames, Acrylic, 3 Coat:
 - 1. One coat ProCryl Universal Primer B66-310 Series.
 - 2. Semi-gloss: Two coats of DTM acrylic enamel; Sherwin Williams B66-200 Series.

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. 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. Exterior Plaster and Stucco: 12 percent.
 - 2. Fiber Cement Siding: 12 percent.
 - 3. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
 - 4. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces 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.
- F. Concrete:
 - 1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
- G. Masonry:
 - 1. Remove efflorescence and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions. Allow to dry.
 - 2. Prepare surface as recommended by top coat manufacturer.
- H. Fiber Cement Siding: Remove dirt, dust and other foreign matter with a stiff fiber brush. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
- I. Exterior Gypsum Board: Fill minor defects with exterior filler compound. Spot prime defects after repair.
- J. Exterior Plaster: Fill hairline cracks, small holes, and imperfections with exterior patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.

- K. Galvanized Surfaces:
 - 1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
 - 2. Prepare surface according to SSPC-SP 2.
- L. 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.
- M. Exterior Wood Surfaces to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior caulking compound after prime coat has been applied. Back prime concealed surfaces before installation.
- N. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- B. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.
- C. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- E. Apply each coat to uniform appearance.
- F. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply additional coats until complete hide is achieved.
- G. Sand wood and metal surfaces lightly between coats to achieve required finish.
- H. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- I. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
- J. 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

**SECTION 09 9123
INTERIOR PAINTING**

PART 1 GENERAL V.20

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.
 - 1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
 - 2. Prime surfaces to receive wall coverings.
 - 3. Mechanical and Electrical:
 - a. In finished areas, paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
 - b. In finished areas, paint shop-primed items.
 - c. Paint interior surfaces of air ducts that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
- D. Do Not Paint or Finish the Following Items:
 - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
 - 5. Stainless steel, anodized aluminum, bronze, terne coated stainless steel, and lead items.
 - 6. Marble, granite, slate, and other natural stones.
 - 7. Floors, unless specifically indicated.
 - 8. Ceramic and other tiles.
 - 9. Glass.
 - 10. Concealed pipes, ducts, and conduits.

1.02 DEFINITIONS

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

1.03 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2014.
- C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 2007.
- D. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition, www.paintinfo.com.
- E. SSPC-SP 1 - Solvent Cleaning; 2015.
- F. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).
- G. SSPC-SP 3 - Power Tool Cleaning; 1982 (Ed. 2004).
- H. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

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.
 - 4. Manufacturer's installation instructions.
- C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
 - 1. Where sheen is specified, submit samples in only that sheen.
- D. Manufacturer's Instructions: Indicate special surface preparation procedures.
- 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.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

1.06 MOCK-UP

- A. See Section 01 4000 - Quality Requirements, for general requirements for mock-up.
- B. Provide panel, 3 feet long by 3 feet wide, illustrating each paint color, texture, and finish.
- C. Provide mock-up on-site of each accent paint colors selected by Architect, minimum 3 feet long by 3 feet wide, in location as directed by Architect. Accent colors to be reviewed by Architect for final approval PRIOR to accent painting starting. Proceeding with Accent painting without approval is done so at Contractor's own risk.
- D. Provide door and frame assembly illustrating paint color, texture, and finish.
- E. Locate where directed by Architect.
- F. Mock-up may remain as part of the work.

1.07 DELIVERY, STORAGE, AND HANDLING

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

1.08 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply materials when relative humidity exceeds 85 percent; at temperatures less than 5 degrees F above the dew point; or to damp or wet surfaces.

- D. Minimum Application Temperatures for Paints: 50 degrees F for interiors unless required otherwise by manufacturer's instructions.
- E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.
- B. Paints:
 - 1. Base Manufacturer: Sherwin Williams Company.
 - 2. Behr Process Corporation: www.behr.com/#sle.
 - 3. Pittsburgh Paints: www.ppgpaints.com/#sle.
- C. Primer Sealers: Same manufacturer as top coats.
- D. Block Fillers: Same manufacturer as top coats.

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.
- B. Colors: As indicated on drawings.
 - 1. Allow for minimum of three colors for each system, unless otherwise indicated, without additional cost to Owner.
 - 2. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.

2.03 PAINT SYSTEMS - INTERIOR

- A. Paint WI-OP-3L - Wood, Opaque, Latex, 3 Coat:
 - 1. One coat of latex primer sealer. PrepRite ProBlock Latex Primer Sealer B51 Series
 - 2. Semi-gloss: Two coats of latex enamel; Pro Industrial Acrylic Semi Gloss B66-650 Series.
- B. Paint MI-OP-3L - Ferrous Metals, Unprimed, Latex, 3 Coat:
 - 1. One coat of acrylic primer. ProCryl Universal Primer B66-310 Series
 - 2. Semi-gloss: Two coats of acrylic enamel; Pro Industrial Semi-Gloss B66-650 Series.
- C. Paint MI-OP-2A - Ferrous Metals, Primed, Acrylic, 2 Coat:
 - 1. Touch-up with recommended primer.
 - 2. Semi-gloss: Two coats of acrylic enamel; Pro Industrial Semi Gloss B66-650 Series.
- D. Paint MI-OP-2L - Ferrous Metals / Roof Deck / Exposed Interior Structure, Primed, Latex, 2 Coat:
 - 1. Touch-up with recommended primer. Pro-Cryl B66-310 Series
 - 2. Semi-gloss: Two coats of water borne acrylic dryfall Pro Industrial Semi Gloss B42-80 Series. .
- E. Paint CI-OP-3E - Concrete/Masonry, Epoxy Enamel, 3 Coat:
 - 1. One coat of catalyzed epoxy primer. Loxon Block Surfacer A24W200
 - 2. Gloss: Two coats of catalyzed epoxy enamel: Full Gloss. Pro Industrial Precatalyzed Gloss Epoxy B73-300 Series .
- F. Paint GI-OP-3L - Gypsum Board/Plaster, Latex, 3 Coat:
 - 1. One coat of alkyd primer sealer. ProMar 200 Primer B28W2600 Series

2. Semi-gloss: Two coats of latex enamel.
 3. Eggshell: Two coats of latex enamel; ProMar 200 B20-2600 Series.
 4. Flat: Two coats of latex enamel; B30-2600 Series (ceilings).
- G. Paint GI-OP-3M - Gypsum Board/Plaster, Epoxy Enamel, 3 Coat:
1. One coat of latex primer sealer. ProMar 200 Latex Primer B28W2600 Series
 2. Gloss: Two coats of water based catalized epoxy enamel; Pro Industrial Epoxy B73-300 Series.
- H. Paint FI-OP-3A - Fabrics/Insulation Jackets, Alkyd, 3 Coat:
1. One coat of alkyd primer sealer.
 2. Eggshell: Two coats of alkyd enamel.

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. 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.
 2. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- F. Concrete:
 1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
- G. Masonry:
 1. Remove efflorescence and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions. Allow to dry.
- H. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.
- I. Galvanized Surfaces:
 1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.

- 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 methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.
- K. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.
- L. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with clear sealer.
- M. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- D. Apply each coat to uniform appearance in thicknesses specified by manufacturer.
- E. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.
- F. Sand wood and metal surfaces lightly between coats to achieve required finish.
- G. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- H. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
- I. 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

**SECTION 09 9723
CONCRETE AND MASONRY COATINGS**

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

- A. Moisture resistant textured concrete and masonry coatings installed on surface of exposed exterior concrete foundations and masonry walls.

1.02 REFERENCE STANDARDS

- A. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus; 2011.
- B. ASTM D522/D522M - Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings; 2013.
- C. ASTM D968 - Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive; 2005 (Reapproved 2010).
- D. ASTM D2243 - Standard Test Method for Freeze-Thaw Resistance of Water-Borne Coatings; 1995 (Reapproved 2014).
- E. ASTM D6904 - Standard Practice for Resistance to Wind-Driven Rain for Exterior Coatings Applied on Masonry; 2003 (Reapproved 2013).
- F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- G. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2014.
- H. ASTM G153 - Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials; 2013.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating coating materials.
- C. Samples: Submit two samples 4 by 4 inch in size illustrating colors and textures available for selection.
- D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.04 QUALITY ASSURANCE

- A. Maintain one copy of each referenced document that applies to application on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- C. Applicator Qualifications: Company specializing in performing the work of this section with minimum 3 years documented experience.

1.05 FIELD CONDITIONS

- A. Do not install materials when temperature is below 55 degrees F or above 90 degrees F.
- B. Maintain this temperature range, 24 hours before, during, and 72 hours after installation of coating.
- C. Restrict traffic from area where coating is being applied or is curing.

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 bond to substrate.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Concrete and Masonry Coatings:
 - 1. Sto Corp; StoColor Acryl Plus: www.stocorp.com/#sle.
 - 2. Textured Coatings of America, Inc: www.texcote.com/#sle.
 - 3. BASF; Masterprotect HB 400. (Formerly Thorocoat). www.master-builder-solutions.basf.us
 - 4. Substitutions: Section 01 6000 - Product Requirements.

2.02 CONCRETE AND MASONRY COATINGS

- A. Provide high-build, weather resistant coating systems that meet the following minimum performance criteria, unless more stringent criteria are specified:
 - 1. Salt Spray Resistance: Passes when tested according to ASTM B117 for 2000 hours.
 - 2. Surface Burning Characteristics: Flame spread/Smoke developed index of 0/0, maximum, when tested in accordance with ASTM E84.
 - 3. Accelerated Outdoor Exposure: Passes when tested according to ASTM G153 for 5,000 hours.

2.03 MATERIALS

- A. Coatings - General: Provide complete systems formulated and recommended by manufacturer for the applications indicated, in the thicknesses indicated.
- B. High Build, One Coat, Water Based Textured Coating for 'Green' Concrete: Water based, epoxy-acrylic resin with graded perlite aggregate.
 - 1. Stated by manufacturer as suitable for installation on visibly damp surfaces and concrete that has hardened but is not fully cured ("green" concrete) without requiring a primer.
 - 2. Dry Film Thickness: 15 mils, minimum.
 - 3. Flexibility Test: Passing, when tested according to ASTM D522/D522M with a 1 inch mandrel.
 - 4. Abrasion Resistance: Passing, when tested according to ASTM D968 with 792 gallons of falling sand.
 - 5. Freeze Thaw Resistance: Passing, when tested according to ASTM D2243 for 50 cycles.
 - 6. Wind Driven Rain Resistance: Passing, when tested according to ASTM D6904 at 98 miles per hour for 24 hours.
 - 7. Water Vapor Transmission: 20 perms, maximum, when tested in accordance with ASTM E96/E96M.
 - 8. Color: From full range of manufacturer's standard colors..
 - 9. Texture: Sand.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that substrate surfaces are ready to receive work as instructed by the coating manufacturer. Obtain and follow manufacturer's instructions for examination and testing of substrates.
- C. Cementitious Substrates: Do not begin application until substrate has cured 28 days minimum and measured moisture content is not greater than 16 percent.
- D. Masonry: Verify masonry joints are struck flush.

3.02 PREPARATION

- A. Clean surfaces of loose foreign matter.
- B. Remove substances that would bleed through finished coatings.
- C. Remove finish hardware, fixture covers, and accessories and store.

- D. Protect adjacent surfaces and materials not receiving coating from spatter and overspray; mask if necessary to provide adequate protection. Repair damage.

3.03 PRIMING

- A. Apply primer to all surfaces, unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.
- B. Concrete and Masonry: Prior to priming, patch holes and indentations and fill cracks with manufacturer's recommended crack repair material.

3.04 COATING APPLICATION

- A. Apply coatings in accordance with manufacturer's instructions, to thicknesses specified.
- B. Apply in uniform thickness coats, without runs, drips, pinholes, brush marks, or variations in color, texture, or finish. Finish edges, crevices, corners, and other changes in dimension with full coating thickness.

3.05 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.
- B. Clean surfaces immediately of overspray, splatter, and excess material.
- C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.

3.06 PROTECTION

- A. Protect finished work from damage.

END OF SECTION

**SECTION 10 1400
SIGNAGE**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Room and door signs.
- B. Emergency evacuation maps.
- C. Building identification signs.

1.02 REFERENCE STANDARDS

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines current edition.
- B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.
- C. ICC A117.1 - Accessible and Usable Buildings and Facilities 2009.

1.03 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 number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
 - 1. When room numbers to appear on signs differ from those on drawings, include the drawing room number on schedule.
 - 2. When content of signs is indicated to be determined later, request such information from Owner through WER Architects at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
 - 3. Submit for approval by Owner through WER Architects prior to fabrication.
- D. Samples: Submit one sample of sign type F and H, of size similar to that required for project, illustrating sign style, font, and method of attachment.

1.04 QUALITY ASSURANCE

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

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Package signs as required to prevent damage before installation.
- B. Package room and door signs in sequential order of installation, labeled by floor or building.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Flat Signs:
 - 1. Image 360: www.image360.com
 - 2. Archway Graphics: www.archwaygraphics.com
 - 3. TakeForm: www.takeform.net.

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 every doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.

1. Flat Signs: Signage media without frame. Refer to drawings for sign types and details.
2. Sign Type A, C, and E: Multi-layered.
 - a. Sign type A:
 - 1) Back Panel: 3form Varia Ecoresin, Trail. 1/2" Gauge, clear finish. Panel to have tactile signage.
 - 2) Front Panel: 1/8" Painted thermoformed acrylic front.
 - b. Sign Type C:
 - 1) Back Panel: 1/8" acrylic with laminate face. Sign to have aluminum laminate logo. Logo artwork to be provided by client.
 - 2) Front Panel: 1/8" Painted thermoformed acrylic front back painted.
 - c. Sign Type F:
 - 1) Back Panel: 1/8" acrylic with laminate face.
 - 2) Front Panel: 1/8" Painted thermoformed acrylic front back painted.
3. Sign Type B, and D: Single layer.
 - a. 1/4 inch acrylic with 1/8" laminate panel and painted edges.
4. Sign Type E" Signage media with frame. Refer to drawings for sign types and details.
5. Material: Round-Corner non-glare plec top peice (P-99), layers together equally approx. 1/4 inch thick with printed second surface (artwork indicated on drawing)
6. Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II braille.
7. Character Height: minimum 5/8 inch.
8. Sizes: As indicated on drawings.
9. Office & Exam Room (Sign Type A): Identify with room numbers to be determined later, not the numbers indicated on drawings; in addition, provide "window" section for replaceable occupant name.
10. Service Rooms (Sign Type B): Identify with room names and numbers to be determined later, not those indicated on drawings.
11. Rest Rooms (Sign Type D): Identify with pictograms, the names "MEN" and "WOMEN", room numbers to be determined later, and braille.
12. Character Height: minimum 5/8" inch.
13. Wall Mounting of one sided signs:
 - a. When mounted on glass: Tape adhesive with acrylic backer that matches flat sign.
 - b. When mounted on gypsum board: Tape adhesive.
 - c. When mounted on Stone or Wood Wall: Brushed nickel standoffs.
14. Color and Font:
 - a. Character Font: Montserrat.
 - b. Character Case: Upper case only.
 - c. Background Color: Color to match Sherwin Williams, to be detrimined by architect.
 - d. Character Color: Contrasting color to be determined by architect.
- C. Emergency Evacuation Maps (Sign Type F):
 1. Quantity: 4.
 2. Map content to be provided by Owner.
 3. Provide "window" section for replaceable evacuation plan.

2.03 SIGN TYPES

- A. Sign A: Typical Room ID with Window Insert - At offices and exam rooms.
- B. Sign B: Typical Room ID without Window Insert - at all other locations not called below.
- C. Sign C: Occupancy Sign.
- D. Sign D: Restroom Wall Sign.
- E. Sign E: Restroom Flag Sign.
- F. Sign F: Evacuation Plan.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install neatly, with horizontal edges level.
- C. Locate signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.
- D. Protect from damage until Substantial Completion; repair or replace damaged items.

END OF SECTION

**SECTION 10 1419
DIMENSIONAL LETTER SIGNAGE**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Dimensional letter signage.

1.02 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's product literature for each type of dimensional letter sign, indicating style, font, colors, locations, and overall dimensions of each sign.
- C. Shop Drawings:
 - 1. Include dimensions, locations, elevations, materials, text and graphic layout, and attachment details.
 - 2. Show locations of electrical service connections.
- D. Samples: Submit one sample of each type of dimensional letter sign of size similar to that required for project, indicating sign style, font, and method of attachment.
- E. Selection Samples: Where materials, colors, and finishes are not specified, submit two sets of selection charts or chips.
- F. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Package dimensional letter signs as required to prevent damage before installation.
- B. Store under cover and elevated above grade.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Dimensional Letter Signs:
 - 1. A.R.K. Ramos: www.arkramos.com/#sle.
 - 2. Inpro Corporation; _____: www.inprocorp.com/#sle.
 - 3. Gemini: www.geminimade.com.
 - 4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DIMENSIONAL LETTERS

- A. Applications: Building identification.
 - 1. Use individual metal letters.
 - 2. Mounting Location: Exterior as indicated on drawings.
 - 3. Allow for total of 50 letters, TBD inches high.
- B. Metal Letters, Sign Type - Custom Logo Behind Reception Desk:
 - 1. Material: Stainless steel sheet, fabricated reverse channel.
 - 2. Thickness: 1/2 inch Manufacturer's standard for letter size.
 - 3. Letter Height: As indicated on drawings.
 - 4. Text and Typeface:
 - a. Character Font: Helvetica, Arial, or other sans serif font.
 - b. Character Case: Upper case only.
 - 5. Finish: Brushed, Satin
 - 6. Color: As selected.
 - 7. Mounting: Projected mount with collars.

2.03 ACCESSORIES

- A. Concealed Screws: Noncorroding metal; stainless steel, galvanized steel, chrome plated, or other.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Notify Architect if conditions are not suitable for installation of signs; do not proceed until conditions are satisfactory.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install with horizontal edges level.
- C. Protect from damage until project completion; repair or replace damaged items.

END OF SECTION

**SECTION 10 2601
WALL AND CORNER GUARDS**

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

- A. Corner guards.

1.02 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Indicate physical dimensions.
- C. Manufacturer's Instructions: Indicate special procedures, perimeter conditions requiring special attention, and ____.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Wall and Corner Guards:
 - 1. Construction Specialties, Inc: www.c-sgroup.com/#sle.
 - 2. Inpro: www.inprocorp.com.
 - 3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 COMPONENTS

- A. Corner Guards - Surface Mounted: Extruded one-piece unit without splices, installed with screws. Basis of Design: Inpro 160 High Impact Corner Guard.
 - 1. Material: Vinyl: Snap on cover of .080" (2mm) thickness shall be made from chemical and stain-resistant unplasticized polyvinyl chloride (uPVC) with the addition of impact modifiers. No plasticizers shall be added (plasticizers may aid in bacterial growth).
 - 2. Width of Wings: 2 inches.
 - 3. Height: 108 inches long; unless noted otherwise.
 - 4. Color: As selected from manufacturer's standard colors.
 - 5. Texture: Suede
 - 6. Surface Burning Characteristics: Provide assemblies with flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with {rs#1}.
 - 7. Products:
 - a. Substitutions: See Section 01 6000 - Product Requirements.
- B. Mounting Brackets and Attachment Hardware: Appropriate to component and substrate.

2.03 FABRICATION

- A. Fabricate components with tight joints, corners and seams.
- B. Pre-drill holes for attachment.
- C. Form end trim closure by capping and finishing smooth.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.

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 to 60 inches high.

3.03 TOLERANCES

- A. Maximum Variation From Required Height: 1/4 inch.
- B. Maximum Variation From Level or Plane For Visible Length: 1/4 inch.

END OF SECTION

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

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

- A. Commercial toilet accessories.
- B. Commercial shower and bath accessories.
- C. Residential toilet, shower, and bath accessories.
- D. Electrically operated paper towel dispensers.
- E. Diaper changing stations.
- F. Utility room accessories.

1.02 REFERENCE STANDARDS

- A. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.
- B. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use; 2004 (Reapproved 2010).

1.03 ADMINISTRATIVE REQUIREMENTS

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

1.04 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. Commercial Toilet, Shower, and Bath Accessories:
 - 1. American Specialties, Inc: www.americanspecialties.com/#sle.
 - 2. Bobrick Washroom Equipment, Inc.: www.bobrick.com
 - 3. Bradley Corporation: www.bradleycorp.com/#sle.
 - 4. Substitutions: Section 01 6000 - Product Requirements.

2.02 MATERIALS

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
 - 1. Grind welded joints smooth.
 - 2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.
- B. Stainless Steel Sheet: ASTM A666/A666M, Type 304.
- C. Adhesive: Two component epoxy type, waterproof.
- D. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.
- E. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.03 FINISHES

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

2.04 COMMERCIAL TOILET ACCESSORIES

- A. Toilet Paper Dispenser (**TA-1a**): Double roll, surface-mounted Toilet Tissue Dispenser and Utility Shelf, Satin Finish Stainless Steel, stainless steel .
 - 1. Products: B-540 manufactured by Bobrick.
- B. Paper Towel Dispenser (**TA-2**): Surface-Mounted Paper Towel Dispenser, Satin Finish Stainless Steel, 525 Multifold Towels
 - 1. Capacity: 400 C-fold or 525 multifold minimum.
 - 2. Products: B-9262 manufactured by Bobrick.
- C. Soap Dispenser (**TA-6**): Surface-Mounted Automatic Liquid Soap Dispenser, Satin Finish Stainless Steel, 30-fl oz.
 - 1. Minimum Capacity: 850 ml (30-fl oz).
 - 2. Products: B-2012 manufactured by Bobrick.
- D. Grab Bars (**TA-7**): Stainless steel, nonslip grasping surface finish.
 - 1. Standard Duty Grab Bars:
 - a. Push/Pull Point Load: 250 pound-force, minimum.
 - b. Length and Configuration: As indicated on drawings.
 - c. Products: B812-2 x Length required, manufactured by Bobrick.
- E. Sanitary Napkin Disposal Unit (**TA-8b**): Surface-Mounted Sanitary Napkin Disposal, Satin Finish Stainless Steel.
 - 1. Capacity: 0.5-gal (1.9-L) minimum.
 - 2. Products: B-35139 manufactured by Bobrick.
- F. Framed Mirror (**TA-11**): Welded-Frame Mirror, Satin Finish Stainless Steel
 - 1. Product: B-290 manufactured by Bobrick.
- G. Countertop Waste Chute Ring (**TA-12**): Stainless steel, countertop mounted circular form, 5.5 inch diameter opening, 6 inches deep.
 - 1. Product: B529 manufactured by Bobrick.

2.05 COMMERCIAL SHOWER AND BATH ACCESSORIES

- A. Robe Hook (**TA-15**): Surface-Mounted Coat Hook, Satin Finish Stainless Steel
 - 1. Products: B-9542 manufactured by Bobrick.

2.06 DIAPER CHANGING STATIONS

- A. Diaper Changing Station (**TA-10**): Vertical Stainless Steel Recessed-Mounted Baby Changing Station for use in commercial toilet facilities, meeting or exceeding ASTM F2285.
 - 1. Material: Stainless steel.
 - 2. Mounting: Recessed.
 - 3. Color: Satin Finish Stainless Steel.
 - 4. Minimum Rated Load: 250 pounds.
 - 5. Products: KB311-SSRE - Stainless Steel
 - a. Koala Kare Products: www.koalabear.com..

2.07 UTILITY ROOM ACCESSORIES

- A. Combination Utility Shelf/Mop and Broom Holder (**MBH-1**): 0.05 inch thick stainless steel, Type 304, with 1/2 inch returned edges, 0.06 inch steel wall brackets.
 - 1. Provide one at each mop sink, typical.
 - 2. Hooks: Two, 0.06 inch stainless steel rag hooks at shelf front.
 - 3. Mop/broom holders: Three spring-loaded rubber cam holders at shelf front.
 - 4. Length: 36 inches.
 - 5. Products: B239 manufactured by Bobrick.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify exact location of accessories for installation.
- C. Verify that field measurements are as indicated on drawings.

3.02 PREPARATION

- A. Deliver inserts and rough-in frames to site for timely installation.
- B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

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

3.04 PROTECTION

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

END OF SECTION

**SECTION 10 4400
FIRE PROTECTION SPECIALTIES**

PART 1 GENERAL V.22

1.01 SECTION INCLUDES

- A. Fire extinguishers.
- B. Fire extinguisher cabinets.
- C. Accessories.

1.02 REFERENCE STANDARDS

- A. NFPA 10 - Standard for Portable Fire Extinguishers; 2013.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide extinguisher operational features.
- C. Shop Drawings: Indicate locations of cabinets and cabinet physical dimensions.
- D. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.
- E. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

1.04 FIELD CONDITIONS

- A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fire Extinguishers:
 - 1. Ansul, a Tyco Business; Cleanguard: www.ansul.com/#sle.
 - 2. Pyro-Chem, a Tyco Business: www.pyrochem.com.
 - 3. Substitutions: See Section 01 6000 - Product Requirements.
- B. Fire Extinguisher Cabinets and Accessories:
 - 1. Activar Construction Products Group - JL Industries: www.activarcpg.com/#sle.
 - 2. Larsen's Manufacturing Co: www.larsensmfg.com.
 - 3. Potter-Roemer: www.potterroemer.com.
 - 4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FIRE EXTINGUISHERS

- A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
- B. Multipurpose Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gauge.
 - 1. Stored Pressure Operated: Deep Drawn.
 - 2. Class: A:B:C type.
 - 3. Size: 10 pound.
 - 4. Temperature range: Minus 65 degrees F to 120 degrees F.

2.03 FIRE EXTINGUISHER CABINETS

- A. Cabinet Configuration: Semi-recessed type, coordinate with wall cavity depth.
 - 1. Size to accommodate accessories.
- B. Door: 0.036 inch metal thickness, reinforced for flatness and rigidity with nylon catch. Hinge doors for 180 degree opening with two butt hinge.
- C. Door Glazing: Acrylic plastic, clear, 1/8 inch thick, flat shape and set in resilient channel glazing gasket.

- D. Cabinet Mounting Hardware: Appropriate to cabinet, with pre-drilled holes for placement of anchors.
- E. Finish of Cabinet Exterior Trim and Door: No. 4 - Brushed stainless steel.
- F. Finish of Cabinet Interior: White colored enamel.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions per NFPA and ADA standards.
 - 1. Handle for Fire Extinguisher Cabinet shall not be installed higher than 52" above finished floor.
 - 2. The top of the Fire Extinguisher mounted inside of Cabinet shall not be higher than 60" above finished floor.
- B. Secure rigidly in place.
- C. Place extinguishers in cabinets.

END OF SECTION

**SECTION 10 8213
EXTERIOR GRILLES, DIVIDERS, AND SCREENS**

EXTERIOR GRILLES, DIVIDERS AND SCREENS

1.01 SECTION INCLUDES

- A. Exterior grilles, dividers and screens attached to structure.
- B. Exterior equipment screens.
- C. Framed exterior polycarbonate mesh screens to be mounted on structure provided by others.

1.02 RELATED REQUIREMENTS

- A. Section 033000 - Cast-in-Place Concrete: Mounting substrates.
- B. Section 042000 - Unit Masonry: Mounting substrates.
- C. Section 051200 - Structural Steel Framing: Mounting substrates.
- D. Section 074213.13 - Formed Metal Wall Panels: Mounting substrates.
- E. Section 084313 - Aluminum-Framed Storefronts: Mounting substrates.
- F. Section 084413 - Glazed Aluminum Curtain Walls: Mounting substrates.

1.03 REFERENCE STANDARDS

- A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2012.
- B. AAMA 612 - Voluntary Specification, Performance Requirements, and Test Procedures for Combined Coatings of Anodic Oxide and Transparent Organic Coatings on Architectural Aluminum; 2015.
- C. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2013.
- D. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.
- E. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2015b.
- F. ASTM A242/A242M - Standard Specification for High-Strength Low-Alloy Structural Steel; 2004 (Reapproved 2009).
- G. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2016.
- H. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2014.
- I. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2009 (Reapproved 2015).
- J. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2010 (Reapproved 2015).
- K. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2015.
- L. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- M. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.
- N. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2014.
- O. ASTM D1187/D1187M - Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal; 1997 (Reapproved 2011).

- P. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- Q. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs; 2013a.
- R. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015.
- S. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).
- T. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).
- U. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2014.
- V. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric) 2014.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures. OR See Division 01, Administrative Requirements for submittal procedures.
- B. Shop Drawings: Prior to commencement of fabrication, submit detailed shop drawings, showing all profiles, sections of all components, finishes, fastening details, and manufacturer's technical and descriptive data. Include field dimensions of openings and elevations on shop drawings.
- C. Product Data: Submit manufacturer's product data, including description of materials, components, finishes, fabrication details, anchors and accessories.
- D. Design Data: Submit comprehensive structural analysis of design for the specified loads and structural attachments. Stamp and sign calculations by professional engineer.
- E. Samples: Submit two (2) of each item below:
 - 1. If requested, provide up to six different powder coat samples for submittal review.
 - 2. 3 inch by 6 inch samples of powder coat OR 2 inch by 2 inch Kynar color chips or anodized aluminum samples.
 - 3. Pattern Sample: Submit 12 inch by 12 inch flat panel, without finish.
- F. Samples: Submit assembled sample 24 inches by 24 inches (610 mm by 610 mm) minimum size to illustrate design, fabrication techniques, workmanship, and finish color.
- G. Test Reports: If required, submit test reports from an independent testing agency showing compliance with specified design and performance requirements.
- H. Manufacturer's Installation Instructions.
- I. Maintenance Data: Manufacturer's instructions for care and cleaning.
- J. Designer's Qualification Statement.
- K. Manufacturer's Qualification Statement.
- L. Installer's Qualification Statement.
- M. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Verification and Coordination:
 - 1. Verify actual locations of walls and other construction contiguous with the work of this Section using field measurements before fabrication. Indicate measurements on Shop Drawings.
 - 2. Embedded Anchor Plates and Structural Connections: Coordinate support sizes and locations.
- B. Engineering:
 - 1. System to be engineered by manufacturer for standard loading criteria and geometry layout.

2. Custom Systems: Structural design to be performed by the manufacturer or a Registered Structural Engineer licensed in the State in which the Project is located.
 3. Engineering for assembly will be provided by manufacturer.
 4. Structural attachment or connections to be engineered by the Engineer of Record for the Project.
- C. Installer Qualifications: Company specializing in installation of exterior grilles, dividers and screen systems with a minimum of five years of documented experience and certified or approved by manufacturer.
 - D. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than ten years of documented experience.
 - E. Fabricator Qualifications: Company specializing in fabrication of products of the type specified in this Section with a minimum of 8 years of documented experience and sufficient production capacity to produce the required units within the Project schedule.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original protective coverings and packaging with corresponding labels and identifying information.
- B. Protect materials against damage during transit, delivery, storage, and installation at site. Protect against bending, warping, twisting or surface damage. Store in accordance with manufacturers written instructions and in a dry location.
- C. Inspect materials upon delivery for damage. Repair damage to be indistinguishable from undamaged areas; if damage cannot be repaired to be indistinguishable from undamaged parts and finishes, replace damaged items.

1.07 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a one year period after Date of Substantial Completion.
- C. Warranty: Manufacturer's standard one year warranty against defects in materials, fabrication, finishes, and installation commencing on Date of Substantial Completion.
- D. Warranty on FEVE and PVDF finishes: Manufacturer's standard ten year warranty on finish. Twenty year warranty optional. Not all colors are available with extended warranties.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Exterior Aluminum Grilles, Dividers and Screens:
 1. BOK Modern, Inc.; Wallscreen; www.bokmodern.com
 2. Substitutions: See Section 016000 - Product Requirements. OR See Division 01, Administrative Requirements for substitution procedures

2.02 DIVIDERS AND SCREENS

- A. Screens: Provide shop fabricated, shop finished screens assembled into panels.
 1. Screen Type: Laser-cut metal sheet.
 - a. Pattern: B21 .
 - b. Panel Depth: .125 inch (mm).
 2. Panel Size and Configuration: As indicated on drawings.
 3. Frame/Support: Extruded aluminum tube or flat aluminum bar.
 4. Wind Load Resistance: Design to resist positive and negative wind load.

2.03 MATERIALS

- A. Metal Surfaces: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations or blemishes; unless allowed for specific metal types and finishes.

- B. Perforated Aluminum Sheet: AA5052-H32, 0.125-inch (0.12 inch) thick.
- C. Laser Cut Proprietary Pattern: As selected by the Architect from manufacturer's full library OR Insert name of custom design and pattern scale here.
- D. Concealed Structural Supports: Aluminum, or steel coated for corrosion resistance and dissimilar metal isolation.
- E. Fasteners: ASTM F593 stainless steel or ASTM A307 carbon steel.
- F. Stainless Steel Tensioning Tubes: ASTM A276/A276M.

2.04 FABRICATION

- A. Fabricate assemblies to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish and anchorage, but not less than required to support structural loads.
- B. Fabricate in accordance with approved shop drawings and manufacturers written instructions. Form work true to line and level with accurate angles and surfaces.
- C. Assemble in the shop to greatest extent possible to minimize field splicing and assembly.
- D. Cut, drill and laser cut metals cleanly and accurately. Remove burrs and ease edges; unless allowed for specific metal types and finishes. Remove sharp or rough areas on exposed surfaces.
- E. Cut, reinforce, drill and tap as indicated to receive finish hardware, screws and similar items.
- F. Use grommets, bushings and washers or methods as recommended by the manufacturer for separation of dissimilar metals.
- G. Disassemble as necessary for shipping and handling, clearly mark units for proper reassembly.
- H. Provide supports, anchorages, and accessories as required for complete assembled system.

2.05 FINISHES

- A. Comply with NAAMM's MFM for recommendations for applying and designating finishes.
 - 1. Appearance of Finished Work:
 - a. Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved samples.
 - b. Noticeable variations in same piece are not acceptable except for steel and anodized aluminum.
 - c. Variations in appearance of other components are acceptable if they are within the range of approved samples and are assembled or installed to minimize contrast.
- B. Finishes for Aluminum; Anodized :
 - 1. Finishes for Aluminum; Powder Coating to meet AAMA 2604:
 - 2. Pretreat according to manufacturers instructions and AAMA 2604 to withstand a minimum of 2000 hours (((ASTM B117))) or 1500 hours (ASTM G85) salt spray testing.
 - 3. Apply Architectural Grade AAMA 2604 compliant topcoat at a minimum of 2.5 mils and process according to manufacturer's recommendations.
 - 4. Color and Gloss: As selected by Architect from manufacturer's full range of choices
 - 5. Finishes for Aluminum; Powder Coating to meet AAMA 2605:
 - 6. Pretreat according to manufacturer's instructions and AAMA 2605 to withstand a minimum of 3000 hours (((ASTM B117))) or 2000 hours (ASTM G85) salt spray testing.
 - 7. Apply standard available colors, high volume RAL, or high volume custom color matches in single coat powder finish containing no less than 100% FEVE (fluorinated ethylene vinyl ether) at a minimum of 2.0 mils and process according to manufacturer's recommendations.
 - 8. Apply custom color matches for low volume as a 2-coat 70% min. PVDF (poly vinylidene fluoride) resin fluoropolymer powder or liquid system including specially formulated inhibitive primer where required by manufacturer and top color coat to total dry film thickness of 2-3 mils.

9. Apply specifically available pallet colors only as a 3-coat system including clear fluorocarbon topcoat using 70% min. PVDF (poly vinylidene fluoride) resin fluoropolymer liquid to total dry film thickness of 2-3 mils.

2.06 ACCESSORIES

- A. Non-Weld Mechanical Fittings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.
- B. Non-Weld Mechanical Fittings: In-line aluminum fittings, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.
- C. Welding Fittings: Factory- or shop-welded from matching pipe or tube; joints and seams ground smooth.
- D. Universal Bracket:
 1. Stainless steel 2-part bracket with flat mounting plate and recessed #12 screws provided by guardrail/railings manufacturer.
 2. Finish: Powder coat.
 3. Color: As selected by Architect from manufacturers standard range.
 4. Manufacturer: BOK Modern, Inc.; www.bokmodern.com.
- E. Anchors and Fasteners:
 1. Select fasteners of type, grade and class required to product connections for anchoring metal panels to other types of construction indicated and capable of withstanding design loads.
 2. Provide anchors and other materials as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
 3. Do not use metals that are corrosive or non-compatible with materials joined. Avoid fastening dissimilar materials and separate with isolating hardware where necessary.
 - a. For anchorage to concrete, provide inserts to be cast into concrete for bolt anchors.
 - b. For anchorage to masonry, provide brackets to be embedded in masonry for bolt anchors.
 - c. For anchorage to stud walls, provide backing plates for bolt anchors.
 - d. Posts: Provide adjustable flanged brackets.
 4. Exposed Fasteners: No exposed bolts or screws.
- F. Carbon Steel Bolts and Nuts: ASTM A307.
- G. Hydraulic Expansion Cement: ASTM C1107/C1107M.
- H. Sealant: Silicone; black.
- I. Finish Touch-Up Materials: As recommended by manufacturer for field application.
- J. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- K. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates and site area for conditions that might prevent satisfactory installation.
- B. Verify that dimensions of supporting structure are within plus/minus 1/8 inch of dimensions indicated on shop drawings.
- C. Verify that painting, roofing, masonry work, and other adjacent work that might damage grille, screen or divider finish have been completed prior to start of installation.
- D. Verify that anchorage devices have been properly installed and located.
- E. Do not install until after all adjacent painting, roofing and masonry have been completed.

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EXTERIOR GRILLES, DIVIDERS, AND SCREENS

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DESIGN DEVELOPMENT

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- F. Do not proceed with installation until all conditions are satisfactory.
- G. Notify Architect immediately of conditions that would prevent satisfactory installation.
- H. Do not proceed with work until detrimental conditions have been corrected.
- I. Furnish components to be installed in other work to installer of that other work, including but not limited to blocking, sleeves, inserts, anchor bolts, embedded plates, and supports for attachment of anchors.

3.02 INSTALLATION

- A. Comply with Drawings and manufacturer's written instructions.
- B. Set grilles level, plumb, with uniform joints, and in alignment with adjacent work as indicated.
- C. Mechanically secure grilles to supporting structure.
- D. Fit exposed connections together to form tight, hairline joints per manufacturers recommendation for seismic movement or thermal expansion and contraction
- E. Do not cut or trim members without approval of manufacturer; do not install damaged members
- F. Adjust before anchoring to ensure alignment at abutting joints.
- G. Use manufacturer's hardware for connections.
- H. Attach securely in place using anchorage devices and fasteners as approved by Engineer of Record.
- I. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.
- J. Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood or dissimilar metals, with a heavy coat of bituminous paint.
- K. Universal Bracket: Install per manufacturers printed instructions.
- L. Weld connections that cannot be shop welded due to size limitations.
 - 1. Weld in accordance with AWS D1.1/D1.1M.
 - 2. Match shop welding and bolting.
 - 3. Clean welds, bolted connections, and abraded areas.
 - 4. Touch up shop primer and factory-applied finishes.
 - 5. Repair galvanizing with galvanizing repair paint per ASTM A780/A780M.
- M. Isolate dissimilar materials with bituminous coating, bushings, grommets, or washers to prevent electrolytic corrosion.
- N. Touch-up damaged finish coating using material provided by manufacturer to match original coating.

3.03 FIELD QUALITY CONTROL

- A. Field Services: Provide the services of the manufacturer for field observation of installation.

3.04 TOLERANCES

- A. Maximum Variation From True Position: 1/8 inch.
- B. Maximum Offset From True Alignment: 1/8 inch.

3.05 CLEANING

- A. Remove temporary protective covering as grilles are installed.
- B. Metal: Clean exposed metal finishes with potable water and mild detergent, in accordance with manufacturer recommendations; do not use abrasive materials or chemicals, detergents, or other substances that may damage the material or finish.
- C. Touch-up damaged finish coating using material provided by manufacturer to match original coating.
- D. Replace grilles that have been damaged beyond touch-up repair.

3.06 ADJUSTING AND PROTECTION

- A. Touch-up and repair damage to exposed finishes to be indistinguishable from undamaged areas.
- B. If damage to finishes and components cannot be repaired to be indistinguishable from undamaged finishes and components, replace damaged items.
- C. Obtain approved coating for repainting surfaces from manufacturer.
- D. Return and replace items that cannot be repaired or refinished in field.
- E. Protect installed components and finishes from damage after installation.

END OF SECTION

**SECTION 12 2400
WINDOW SHADES**

PART 1 GENERAL V.20

1.01 SECTION INCLUDES

- A. Interior manual roller shades.

1.02 REFERENCE STANDARDS

- A. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015.
- B. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2015.
- C. WCMA A100.1 - Safety of Corded Window Covering Products; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.
- C. Shop Drawings: Include shade schedule indicating size, location and keys to details, head, jamb and sill details, mounting dimension requirements for each product and condition, and operation direction.
- D. Selection Samples: Include fabric samples in full range of available colors and patterns.
- E. Operation and Maintenance Data: List of all components with part numbers, sources of supply, and operation and maintenance instructions; include copy of shop drawings.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of this type with minimum two years of documented experience with shading systems of similar size and type.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver shades in manufacturer's unopened packaging, labeled to identify each shade for each opening.

1.06 WARRANTY

- A. See Section 01 7800 - CLOSEOUT SUBMITTALS, for additional warranty requirements.
- B. Provide manufacturer's warranty from Date of Substantial Completion, covering the following:
 - 1. Chain and Hardware: 25 years.
 - 2. Fabric / Shadecloth: 25 years.
 - 3. Aluminum and Steel Coatings: One year.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Interior Manually Operated Honeycomb Shades:
 - 1. Hunter Douglas Contract; Duette FR Honeycomb Shades: <https://www.hunterdouglas.com/>
 - 2. Draper, Inc: www.draperinc.com/#sle.
 - 3. MechoShade Systems LLC: www.mechoshade.com/#sle.
- B. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ROLLER SHADES

- A. General:
 - 1. Provide shade system components that are easy to remove or adjust without removal of mounted shade brackets.
 - 2. Provide shade system that operates smoothly when shades are raised or lowered.
- B. Roller Shades Type Motorized - Basis of Design WS-02: MechoShade Systems LLC; ElectroShade with WhisperShade IQ2 EDU, line voltage (120 VAC); www.mechoshade.com/#sle.
 - 1. Description: Single roller, motor operated fabric window shade system complete with mounting brackets, roller tubes, hembars, hardware, and accessories.
 - 2. Brackets and Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
 - 3. Roller Tubes:
 - a. Material: Extruded aluminum.
 - b. Size: As recommended by manufacturer; selected for suitability for installation conditions, span, and weight of shades.
 - c. Fabric Attachment: Utilize extruded channel in tube to accept vinyl spline welded to fabric edge. Shade band to be removable and replaceable without removing roller tube from brackets or inserting spline from the side of the roller tube.
 - 4. Hembars: Designed to maintain bottom of shade straight and flat.
 - 5. Accessories:
 - a. Fascia: Removable extruded aluminum fascia, size as required to conceal shade mounting, attachable to brackets without exposed fasteners; baked enamel finish.

2.03 SHADE FABRIC

- A. Fabric WS-02: Non-flammable, color-fast, impervious to heat and moisture, and able to retain its shape under normal operation.
 - 1. Material: Vinyl coated polyester, single thickness non-raveling 0.030-inch (0.762 mm) thick, woven from 0.018-inch (0.457mm) diameter extruded vinyl yard comprising of 21 percent polyester and 79 percent reinforced vinyl.
 - 2. Performance Requirements:
 - a. Flammability: Pass NFPA 701 large and small tests.
 - 3. Openness Factor: 3%.
 - 4. Color: As selected by Architect from manufacturer's full range of colors.

2.04 SHADE FABRICATION

- A. Field measure finished openings prior to ordering or fabrication.
- B. Dimensional Tolerances: Fabricate shades to fit openings within specified tolerances.
 - 1. Vertical Dimensions: Fill openings from head to sill with 1/2 inch space between bottom bar and window stool.
 - 2. Horizontal Dimensions - Inside Mounting: Provide symmetrical light gaps on both sides of shade not to exceed 3/4 inch total.
- C. At openings requiring continuous multiple shade units with separate rollers, locate roller joints at window mullion centers; butt rollers end-to-end.
- D. Blind measurements shall be accurate to within 1/8" or as recommended in writing by manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine finished openings for deficiencies that may preclude satisfactory installation.
- B. Start of installation shall be considered acceptance of substrates.

3.02 PREPARATION

- A. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under the project conditions.
- B. Coordinate with window installation and placement of concealed blocking to support shades.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.
- B. Adjust level, projection, and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure smooth shade operation.

3.04 PROTECTION

- A. Protect installed products from subsequent construction operations.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION